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AIML (Artificial Intelligence Markup Language) for Online Chinese Language Learning Assessment

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Contents

I hereby certify that this material, which I now submit for assessment of the programme of study leading to the award of Master of Science in Learning Technology is entirely my own work and has not been taken from the work of others save and to the extent that such work has been cited and acknowledged within the text of my work.

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Abstract

Are there relationships between Chinese language learners' asked questions while they are talking with a virtual robot and their Chinese language proficiency as well as other relevant information such as their psychology, their self-confidence, their interested complementary, supplementary information etc.? How to use them to correctly detect learners' language proficiency and all related information if the relationships do exist? The thesis is going to identify these relationships; test these relationships; find the causation of these relationships; explore the implementation of using these relationships.

The researcher used a hybrid of quantitative, qualitative, case study and classical 'positivistic' design with which 30 Chinese language learners were selected as micro cases and the relationships between their asked questions while talking with a virtual robot and their Chinese proficiency as well as their psychology, their self-confidence, their interested complementary, supplementary information etc are identified, tested, their implementation explored.

So we may use Chinese language learner's asked questions while they have a free conversation with a virtual robot to correctly detect their Chinese proficiency level, their psychology, their self-confidence, their interested complementary, supplementary information etc. according to the t test of the researcher's sample statistics. This is efficient, because learners asked questions are the questions they really want to know from their free will without extra time required for a formal survey and assessment.

1. Introduction

The goal of this thesis is to develop and evaluate a method to assess Chinese language E-Learners' knowledge and their interests in different online courses by analysing pattern in question asking. The general idea pursued rests on an analysis of co-occurrences of questions. It works by identifying association rules based on logs of questions collected in a dialogue system (e.g., implemented on the basis of AIML).

For instance,
"If a student asks question A, there is a probability of .12 that he/she also asks question B." From a more formal point of view, we may conceive of these relationships as association rules.

This approach has much in common with an analysis of cross-selling patterns well known in shopping basket analysis. For instance, if you have ever gone to www.amazon.com to buy something (books, CDs, etc.), clicking on the book you interested you would find that the website also offers you the information that customers who bought the same items also bought what else; customers who viewed the same items also viewed what else; customers' reviews about all related items; producer's reviews about all relevant products; expert reviews of all items related; current customer may add their own reviews. The relating products may also be further classified into vertical related, horizontal related, complementary, supplementary etc. These are helpful for people to make informed decisions about whether to buy this products or not and for people to know what are the related products in this area. This idea may also be applied to E-Learning.

The method used in this project is based on the AI – artificial intelligence theory. The key ideas are to create a chat robot in the website – http://pandorabots.com/botmaster/en/home by using AIML – Artificial Intelligence Markup Language. A chat robot is a natural language character that communicates with clients, or people chatting on the web, instant messenger, email, usenet, web forums, or even through voice communication such as the telephone. There is a long list of killer applications of chat robot technology such as: Adult Entertainment,

Teacher Bot etc. Mine is going to be a FAQ Bot - Answering the questions asked by online learners; collecting, classifying, analysing, validating and testing all the questions and analytical results.

The AIML is designed to be as easy to learn and use as HTML – Hyper Text Markup Language (the basic language used to create all web pages). AIML, or Artificial Intelligence Mark-up Language is an XML-based programming language. It was designed specifically for the creation of the A.L.I.C.E. chatterbot. Although with broad usability potentials, the language is more suitable for the producing of natural language software agents, known as Alicebots. AIML contains several elements. The most important of these are described in further details below.

Categories

Categories in AIML are the fundamental unit of knowledge. A category consists of at least two further elements. These are the pattern and template elements, which are usually coded in that order. However, this is not a necessary programming syntax.

Patterns

Alicebots are generally described as 'pattern-matching' chatbots. This means that the program will search for patterns within a user's input and respond accordingly. The pattern element defines the pattern that will be searched for, hence its name.

Template

If a pattern within a category is matched successfully and it is the most accurate pattern that can be matched, then the category-specific template is applied to the chatbots response. This template can contain other AIML elements, which allow automated customisation of the chatbot's response.

The website Pandorabots is a web site that uses a hidden source program written in a commercial variant of Lisp and implements most of AIML with some variations--they make impressive but unverifiable claims about the size of their user community.

1.0 Interest in Research Area

There are more and more Chinese language e-learners today with more and more different courses and programmes of different depth, difficulties, scopes, focuses etc. available. How to use an interesting, intelligent and user-friendly methods and technologies to match the potential Chinese language e-learners with the most suitable courses and programme is an attractive and challenging research question to me. The AIML based artificial intelligent Robots might be one of the answers.

1.1 Research Objectives

1 – To identify, test, find the causations of the relationships of Chinese language learner's asked questions while they have a free conversation with a virtual robot and their Chinese proficiency level, their psychology, their self-confidence, their interested complementary, supplementary information etc.

2 - To explore the possibility of detecting correctly Chinese learners' Chinese proficiency level, their psychology, their self-confidence, their interested complementary, supplementary information etc. by analysing their asked questions while they talking freely with a virtual robot.

1.2 Research Questions

1. How to identify, test, find the causations of the relationships of Chinese language learner's asked questions while they have a free conversation with a virtual robot and their Chinese proficiency level, their psychology, their self-confidence, their interested complementary, supplementary information etc.?

2. How to explore the possibility of detecting correctly Chinese learners' Chinese proficiency level, their psychology, their self-confidence, their interested

complementary, supplementary information etc. by analysing their asked questions while they talking freely with a virtual robot?

1.3 Research Contribution

It is predicted that the findings of this research will be of particular interest to Ministries of Education, E-Learning researchers, Educational strategists, E-Learning Research Institutes, Education Legislatures and general E-Learners.

1.4 Literature Review

1.4.1 Multi dimensional assessment with different sources of information

Foxcroft and Roodt (2001) propose multi dimensional process psychological assessment analysis that involves gathering and integrate different sources of relevant information with the intent only one result.

After many years of disappointment and perceived irrelevance, theories of teaching and learning in the secondary and tertiary institutions are beginning to gain widespread consensus amongst psychologists and practitioners. We have some knowledge of how students learn and how to put that knowledge to practical use, but we don't know much about the technology of assessment. Although there are some progresses in the development of assessment tasks that are criterion referenced to crucial stages in the acquisition of academic competence. (Biggs 1994, p. 14)

From the above literature, the researcher knows that learning assessment is still underdeveloped and the multi dimensional process approach could be explored.

1.4.1.1 Easy, lively, comfortable, unbiased and unassisted self report learning assessment

Cost saving and time efficient

Cost savings and speed to productivity are the uniqueness of e-learning, (Britt 2004, pp. 36-40) thousands of organizations have benefited from these by integrating e-learning content and technologies into training processes.

For the purposes of cost saving, using of computers and the Internet, interview alone might not be enough for assessment and testing, because the different condition of interviewees. (Groth-Marnat 1999) Accordingly the researcher's robot type survey and assessment might be a cost saving, time efficient instrument and might integrate learner feedbacks.

Easy, lively, unbiased self report

Wiederman (1999) supports easy, lively, comfortable and unbiased assessment environment without biased demonstration that may distort the research results. The researcher's robot type survey and assessment is unmonitored and without biased demonstration for learners.

Anxiety and depression are detrimental to memory, learning efficiency, effectiveness. (Eysenck & Keane, 1995, pp. 435-447)

Elliot (2000) proves that psychological assessment is useful for learners and it should be done unassisted and independently by the learners. The researcher followed Elliot's advice for the learning survey and assessment with no unnecessary assists and interventions.

For the purpose of interpreting the deeper unconscious reality, self report psychological assessment could be used, because learners are willing and motivated to

do self report assessment in their ideal environment, atmosphere, pace, speed, continuity, intermittency, stress level etc. (Osberg 1989) The researcher must be able to interpret the self report properly as well as the important information of the self confidence rating by learners themselves. Also past behavior of learners' attention, intelligence and (private self consciousness) introspectiveness might increase accuracy of self-reporting. Opposite to the above, public self-consciousness might decrease accuracy of self-reporting.

Levy & Plucker (2003)'s report reaffirm that learners' psychological traits, self-report and projective measures are very important for psychological assessment.

The researcher's robot type, self help, unmonitored free conversation learning assessment and survey might gauge learners' deeper unconscious reality; could put learners into the environment, atmosphere, pace, speed, stress level etc. of their own choices; may let learners to pay more attention to their past behavior, private self consciousness; can remove the embarrassment and bad effects of public self-consciousness, because learners' privacy is duly respected, protected and encouraged. The researcher also let learners indicate their self-confidence rating of their own survey and assessment.

Spontaneous recollection of the memory

Alexander (1988) believes that the spontaneous recollection of the memory learner's has lived and the direct interviews that focus on live experiences are the richest sources to extract most meaningful information of learners' psychology. The freer, less consciously and more indirect the information, the more reliable and more accurate the results are. To achieve this, we have to break the conscious communicational intent of the content. The researcher's robot type learning survey and assessment are relatively free, less consciously and less direct.

Alexander (1988) also points out the key assessment areas that researchers should pay attention to. They are Saliency, frequency, uniqueness, negation, emphasis, underemphasis,

omission, error, distortion, incompletion and isolation. The researcher will follow this instruction when analyze the assessment.

Combination of traditional and interactive assessment

Tang (1994) demonstrates the effects of different modes of assessment on student learning that at one end of the spectrum of research on student learning, theorists such as Riding and Cheema (1991) have emphasized the importance of trait-like and habitual learning styles in determining an approach to learning, however at the other end, straight phenomenography is based entirely on student perceptions of the context (see for example Marton and Säljő, 1976). The results of the present study do not only support the two ends of the spectrum, they also go beyond to indicate an interactive model between the presage personological and contextual influences on learning.

Since effective and useful dynamic and interactive approach to psychological with helpful individualized and tailored interactive assessment can produce otherwise unavailable information, normative and standardized PA have been criticized for not related to motivations and learning process underlies. Learners' unassisted performance or zone of actual development can explore their potentials to some degree that is more important than only their current status. (Haywood & Wingenfeld 1992, pp253-268) Comparisons should be made between traditional and interactive assessment to find their advantages.

The researcher's robot like and conversation focused learning assessment and survey gives learners ample chance for unassisted, developing, dynamic and interactive performances that may produce otherwise unavailable information to find learners' motivations, potentials and learning process underlies. Because the researchers' assessment is a mixture of traditional (part of the first half survey) and interactive assessment, comparisons may be made between them and statistical significance will be examined.

Liou, et al. (2003) believe in evaluation methods such as psychometric means in a comparison design, discourse analysis, conducted portfolio in order to advance the understanding of learners' behavior when they work online. They envision that learners will be capable of the complex problem solving needed to network with foreign language users in other countries. This is a means to achieving the goal of

learner autonomy and life-long learning, so learners can move from computational scaffolding to full participation in the native speaking discourse community.

The researcher's robot type learning survey and assessment can not only open relevant and useful websites for learners to get vital information as well as to communicate with native speakers, but also can provide problem solving experience in virtual realities. Learners' survey and conversational record stored in the online database will be analyzed by using psychometric means.

The researcher is not alone at this front; Loritz (1999) is continuing to focus their efforts on developing GPARS technology as a diagnostic aid to teachers and researchers. GPARS is a generalized transition network system designed for language study by both students and researchers.

"It is important to place these potential interaction effects into a broader context. First, we should remember that the largest percentage of the variance in foreign language learning outcomes will continue to be the main effect based on the overall ability level of the learner and the overall level of difficulty of the language. However, within this general framework, we need to study additional interactions for both practical and theoretical reasons. Second, this model of learner-language interactions ignores the other important determinant of the outcome of language learning, which is the nature of the educational treatment. A good teacher may be able to help a good student overcome some particular roadblock during language learning. At the same time, a good learner may be able to make use of the teacher as a resource in the process of overcoming specific disabilities or difficulties." (MacWhinney 1994)

The researcher totally agrees with MacWinney (1994)'s view and approach and will put potential interaction effects into practice by the robot like and conversation-focused learners' survey and assessment.

1.4.1.2 Learning assessment enhancing critical thinking, creativity and spontaneous recollection of memory

Critical thinking is a very important skill for teaching, learning and psychology. (McCarthy-Tucker 2001) The researcher's robot type learning survey and assessment might spur learners' critical thinking activities.

According to Thompson & Randall (2001, pp. 289-292), Creativity, imaginative activity and originality are not unique to the arts, but to all areas of everyday life. Not all people believe that creativity can be taught in e-learning environment and education. Strong self-belief, esteem and positive self-image in their creative and other related abilities are vital and fundamental for highly creative people and e-learners. E-learning is just the tool and environment to create the creative possibility for e-learners to try and to perform to foster their creativity. The researcher's robot like learning survey and assessment could give the desired environment to some extent for creativity.

1.4.1.3 Conversation is very important for learning assessment

Metros & Hedberg (2002) consent that e-learners need outcomes and interactivities.

Fox & MacKeogh (2003, p. 121)'s evaluation points out that students can engage in higher-order learning by developing effective ways of conducting online discussion without demanding excessive tutor time. The researcher's robot like learning survey and assessment might give learners' more chance to engage in conversation and discussion. This gives learners more control of their learning and more interactivities that are promoted by Britt (2004).

Also Northrup (2002, pp. 219-226) stresses the importance of conversation as well, because timely response from peers and instructors may keep learners motivated and entertained.

However in reality few systems that allow the user to engage in some form of meaningful dialogue. (Seneff, Wang & Zhang 2005) Perhaps the most closely related research is the Fluency project at CMU, where carefully constructed questions are intended to solicit with extremely high likelihood a small number of possible answers. (Eskenazi, 1999) has recognized the benefits of giving the student an active rather than a passive role in the exercise, for the purpose of improving language retention rate, they are currently pursuing, aimed at the ambitious goal of providing spoken conversational interaction with a computer as an aid to second language acquisition.

The researcher's learners' survey and assessment is totally active dialogue focused with the aid of computers and the Internet.

Witt (1999) is confident that speech recognition and assessment is the future trend of Chinese learning assessment. The researcher's active dialogue centered learners' assessment and survey is to some level related to this trend, but at this stage the researcher has neither resources nor time for this task. This could be the researcher's future perspective.

From dialoguing with these individuals with content area expertise and working with those faculty who have the "time, expertise, and facilities", service providers are better able to clarify course expectations, identify creative learning and testing options, and generate new learning alternatives through collaborative input. (Scott & Manglitz 1999) (Ganschow & Sparks 1987) The researcher's learning survey and assessment collaborate with learners to negotiate possible options and alternative for learners.

1.4.1.4 Functional behavior assessment

Functional behavior assessment is a branch of psychological assessment that is to find the causes effects relations of psychological and behavioral variables. The behaviors should be observable, measurable and can be retested. (Shriver, Anderson & Proctor 2001, Vol. 30, No. 2, pp. 180-192) Functional behavior assessment makes the

researcher's assessment analysis clearer and more profound. Generally speaking the learners' behaviors are observable, measurable and retestable.

Ritzler (1992) thinks that both behavioral and non-behavioral assessment are important and they may complement each other.

1.4.1.5 Dynamic assessment and intervention programs for learning assessment

Berman (2003) proposes Vygotsky's theories of integrated learning, teaching and assessment and Feuerstein's theory of cognitive modifiability and their derivative of Dynamic assessment' target is to provide conventional measures of learning as well as to explore the nature of that learning and to complement the conventional tool kit of psychometric tests available to school psychologists and to provide another angle and level on learning. It links psychology practice and the teaching and learning closer in the classroom.

Lauchlan & Elliott (2001, p. 647)'s theory and experiment yield half positive results for dynamic assessment or learning potential for learning difficulty children.

"**Background.** The paper considers the construct of learning potential (or dynamic assessment) and its use in the psychoeducational assessment of children with learning difficulties.

Aims. The principal research aim was to examine the extent to which learning potential (dynamic) assessment can predict which children with severe learning difficulties will gain most from a structured programme of cognitive intervention.

Sample. The sample consisted of 30 children (mean age 9 years) based in a school for children with moderate/severe learning difficulties.

Methods. Half of the children were assessed both before and after the delivery of a 15-month cognitive intervention programme undertaken by the first author. The other

half took part in the assessments but continued with their usual classroom programme. Assessments included the use of both dynamic and static measures. On the basis of the assessments, students were divided into high and low potential groups and comparison of gains after the intervention was undertaken.

Results. The measurement of learning potential appeared to predict subsequent performance in some, but not all, areas. Those who were most likely to make gains were those children deemed as 'high potential' who also received the cognitive intervention.

Conclusions. The value of learning potential assessment was not clearly demonstrated. The implications of the results are explored and, in particular, the authors warn of the dangers of drawing upon the results of learning potential measures in an inappropriate fashion."

The researcher's dynamic learning survey and assessment gives necessary responses and modification after careful quantitative and psychological analysis that may have a chance to test the aforesaid dynamic learning assessment again.

1.4.2 The detailed steps to apply the aforementioned theories

"Conclusively designing a complex assessment is hard work. There are problems of content, functionality, and communication. There are issues of psychology, statistical modeling, and fulfillment of purpose. To make the process efficient, we want to provide the designer with as much structure as we can without constraining design options unnecessarily. We want to maximize opportunities to reuse assessment objects and processes." (Almond, Steinberg & Mislevy 2002)

1.4.2.1 Multimedia-rich assessment

Power (2002) proposes multimedia-rich illustrations to develop website software to evoke learners' verbal/linguistic intelligence in accordance with Gardner's multiple

intelligences theory. The researcher's learning assessment and survey has used website software to evoke learners' verbal & linguistic intelligence according to Gardner' multiple intelligences theory.

Eysenck and Keane (1995, p. 45) point out that visual perception is well organised or grouped together. Similarity, proximity etc are the determining factors for the visual display organisation, so how to organise or produce similar or proximal elements of pictures, animations or learning environment to learners' advantages is a prior consideration. The researcher's learning survey and assessment will consider similarity, proximity grouping for the advantages of learners.

Treisman's experiment confirms that echoic store that is a transient store in the auditory modality consisting of relatively unprocessed auditory input is real. (cited in Eysenck & Keane 1995, p126) This means sound and verbal impression is helpful for learners. The researcher will add sound and verbal components into the learning survey and assessment if time is enough.

Almond, Steinberg & Mislevy (2002) propose a four-task model for e-learning assessment

1. We start with the *Reading Task Model.* In this kind of task, our presentation material is a representation of the character.

2. The *Phonetic Transcription Task Model* requires only a simple change from the Reading Task Model. For this kind of task instead of a speech sample, the expected response would be a short string of characters that give the phonetic pronunciation.

3. In the *Writing Task Model,* the presentation material will consist of one of the pronunciations of the character, followed by an example of its usage in a common word or phrase.

4. For the *Character Identification Task Model.*

The researcher's learning assessment utilized most of these task models.

1.4.2.2 Design tips

Cassarino (2003) teaches that applicable metaphors, grouping of themes, user determinations, user choices, obvious indication of what is it, how to use it and what do I know as well as different media type choices should be the instructional design principles for e-learning environment. If time allows, the researcher will use proper metaphors, classify different themes, give users different media type options and provide virtual human or animation instructions.

Lotherington (1999) thinks that bilingual environment is possible and helpful for language learning. The researcher has some bilingual content in the learning assessment and survey.

1.4.2.3 Negotiating goals and analyzing interaction for the learning assessment

Hirumi (2003) confirms that negotiating learning strategy, learning goals and objectives; analyzing learning interaction; evaluating heuristic scenarios are valuable for e-learning. Generally the researcher followed these steps in the robot like learning assessment and survey.

Hirumi (2002, p. 141) emphasize 6 steps to plan for 3 e-learning levels. The 3 levels are:

1. The interaction within learners' own mind, ego, cognitive movement.

2. The interaction among human-human of learner-instructor, learner-learner, learner-other human and the interaction between human-nonhuman of learner-content, learner-interface, learner-environment.

3. Learner-instruction interaction level consists instruction strategy, research and theory.

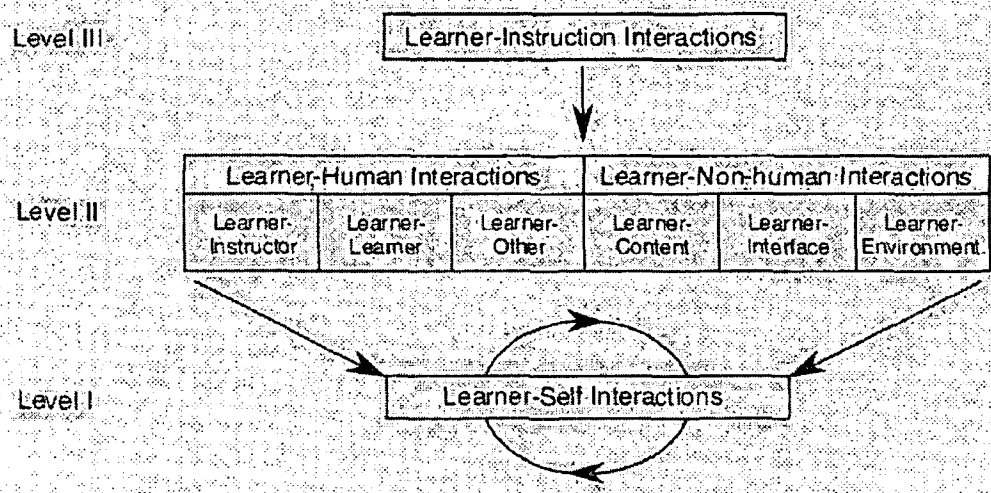


FIGURE 1
Three Levels of Planned Elearning Interactions

A Framework For Analyzing, Designing, and Sequencing Planned Elearning Interactions

Step 1— Identify essential experiences that are necessary for learners to achieve specified goals and objectives (optional);

Step 2— Select a grounded instructional strategy (Level III interaction) based on specified objectives, learner characteristics, context and epistemological beliefs;

Step 3— Operationalize each event, embedding experiences identified in Step 1 and describing how the selected strategy will be applied during instruction;

Step 4— Define the type of Level II interaction(s) that will be used to facilitateeach event and analyze the quantity and quality of planned interactions;

Step 5— Select the telecommunication tool(s) (e.g., chat, email, bulletin board system) that will be used to facilitate each event based on the nature of the interaction,and

Step 6— Analyze materials to determine frequency and quality of planned eLearning interactions and revise as necessary.

FIGURE 3
Six Step Process for Designing and Sequencing eLearning Interactions

The researcher's learning assessment and survey give maximal possibility of interaction and communications.

Learning evaluation and feedback are very important part of learning assessment as well as pre learning activities. (Berge 2002) The researcher's learning assessment and survey is all about learning evaluation, feedback and pre learning activities.

1.4.2.4 Software runs directly from the Internet

Abernathy & Allerton (1999) idealize that a personal file or software can run directly from the Internet and search the Internet like an agent for useful information for clients. The researcher's learning assessment and survey can run directly from the Internet and search the Internet for useful information for the users.

1.4.3 Culture consideration for learning assessment

Impact of culture and history on psychological assessment is significant. (Deters & Zerbe 2000)

Glass (2001) certifies that cultural consideration for sub test is warranted.

Grados & Russo-Garcia (1999) state that data should be analyzed according to different population and minority groups' unique situation and circumstances. These mostly affect crystal abilities (gain by education and accumulation) rather than fluid abilities (innate problem solving ability without education and culture).

According to this theory, the researcher asks which continent the learner is from in the survey and assessment in order to take cultural differences and influences into consideration.

1.4.3.1 Culture and language learning is inseparable

"This thesis is concerned with the contribution and incorporation of the teaching of culture into the foreign language classroom. More specifically, some consideration will be given to the *why* and *how* of teaching culture. It will be demonstrated that teaching a foreign language is not tantamount to giving a homily on syntactic structures or learning new vocabulary and expressions, but mainly incorporates, or should incorporate, some cultural elements, which are intertwined with language itself. Furthermore, an attempt will be made to incorporate culture into the classroom

by means of considering some techniques and methods currently used. The main premise of the paper is that effective communication is more than a matter of language proficiency and that, apart from enhancing and enriching communicative competence, cultural competence can also lead to empathy and respect toward different cultures as well as promote objectivity and cultural perspicacity." (Thanasoulas 2005, p.1)

Thanasoulas (2005) also confirms that foreign language learning is not only about code, rules, sound and grammars, but also about it's conveyed cultures, beliefs, religions, customs, background and history that give real life and meaning to languages. It is about cultural understanding, cultural behaviourism and cultural manipulation as well. Cultures and languages are deeply incorporated and intertwined just like the two sides of the same thing. There are 5 reasons for the tight relationship between culture and language:

1. Language acquisition does not follow a universal sequence, but differs across cultures;

2. The process of becoming a competent member of society is realized through exchanges of language in particular social situations;

3. Every society orchestrates the ways in which children participate in particular situations, and this, in turn, affects the form, the function and the content of children's utterances;

4. Caregivers' primary concern is not with grammatical input, but with the transmission of social cultural knowledge;

5. The native learner, in addition to language, acquires also the paralinguistic patterns and the kinesics of his or her culture.

There are 7 goals and means of language and culture learning:

1. To help students to develop an understanding of the fact that all people exhibit culturally conditioned behaviours.

2. To help students to develop an understanding that social variables such as age, sex, social class, and place of residence influence the ways in which people speak and behave.

3. To help students to become more aware of conventional behaviour in common situations in the target culture.

4. To help students to increase their awareness of the cultural connotations of words and phrases in the target language.

5. To help students to develop the ability to evaluate and refine generalizations about the target culture, in terms of supporting evidence.

6. To help students to develop the necessary skills to locate and organize information about the target culture.

7. To stimulate students' intellectual curiosity about the target culture, and to encourage empathy towards its people.

Cultural problem solving, cultural comparison and cultural complement are some of the effective and stimulating methods for cultural learning. Learners should be aware of speech acts, connotations, etiquette, that is, appropriate or inappropriate behaviour which are the proper starting points for culture learning. (Thanasoulas, 2005)

The researcher's learning survey and assessment use robot like conversation to analyze learners' cultural background and cultural awareness to do necessary adjustment and modification and provides settings for cultural problem solving, cultural comparison and cultural complement (such as some bilingual and cultural explanations).

1.4.3.2 Online learning is not suitable for all cultural backgrounds

Online learning is not suitable for all cultural backgrounds, social classes, religious sectors and geographical locations. (Kearsley 2002) For example, online learning might not suitable for American aborigines, special disabled persons and some non-western countries, so we have to consider these before we can effectively apply online learning to suitable target audience.

1.4.3.3 Telecommunications and exchanges cultivate culture awareness

O'Dowd (2004) found that telecollaborative exchanges were able to facilitate culture learning for learners by providing different version of knowledge which are totally different from the ordinary textbooks and other traditional Cultural Studies resources. They are not completely objective; rather they depend on the learner's own subjective and personalised accounts and nature for the real world.

Applying different online tools and media could enhance Telecollaborative exchanges' functionality and efficiency. O'Dowd (2004) also revealed that the three key elements of successful intercultural telecollaboration are the definition of culture, skills of interaction and analysis that are not innate talents or capability which needs cultivation.

The first step is to develop an anthropological definition and the real meaning of a culture and its cultural behaviour rather than the behaviour itself. Secondly learners should master the necessary skills, knowledge and techniques for interactive, responsive, productive, insightful, investigative and enquiring online expressing their own culture and learning their counterparts' cultural heritage. Finally learners need develop their own analytical and perceptive capability to really understand the online cultural contents. (O'Dowd 2004)

The researcher's learning survey and assessment used Internet based robot like conversation as the tool and platform for telecollaborative exchanges in order to

cultivate learners' culture awareness, define culture meanings, facilitate culture interactivities and understanding.

"In conclusion, the findings of this study have found that individuals respond in a manner, perhaps even a mind-set, that is consistent with the culture of the language in which they are responding. While these findings support the theory presented, one study does not prove a theory. Therefore, further research to evaluate this phenomenon is needed. However, these findings strongly suggest the conclusion that researchers who do not use native language instruments may be loosing valuable cross-cultural information." (Ralston, Cunniff & Gustafson 1993) So the researcher's learning survey and assessment attempted some bilingual elements.

Courcy (1997) promotes culture awareness especially for immersion stage.

1.5 Theory and Hypotheses

1.5.1 The General Three Difficulty Levels of Chinese Language Learning

1. The very beginners with no or very little knowledge of Chinese language.

2. Learners have some intermediate knowledge of Chinese language.

3. Learners have advanced knowledge of Chinese language.

1.5.2 Questions the Learners at the Three Different Difficulty Levels of Chinese Language Learning Most Likely will Ask

1.1 How long does it take me to be an intermediate Chinese speaker?
1.2 Is it possible for me to learn Chinese?
1.3 Is it useful to learn Chinese?

1.4 Please tell me the earning potential of learning Chinese.

1.5 Is it difficult to learn Chinese?

1.6 Is it easy to find a Chinese related job?

1.7 Please tell me the meaning, pronunciation of a special Chinese character, characters or phrases.

1.8 Please explain a special Chinese character, characters, phrases or sentences for me.

1.9 What is the meaning or pronunciation of a special Chinese character, characters, phrases or sentences?

2.1 What is the synonym of a special Chinese character, characters.

2.2 What is the antonym of a special Chinese character, characters.

2.3 What is the meaning, pronunciation or origin of Chinese idioms, proverbs, set phrases or short paragraphs?

2.4 Please explain the Chinese idioms, proverbs, set phrases and short paragraphs for me.

2.5 May I speak with native speakers?

2.6 How to write Chinese sentences.

2.7 How may I have my self-written Chinese sentences corrected?

2.8 Please explain the simple short novels and fictions; simple poems; grammar; simple classical Chinese and ancient prose for me.

2.9 What is the meaning, origin of the simple short novels and fictions; simple poems; grammar; simple classical Chinese and ancient prose.

2.10 Please recommend suitable simple short novels and fictions; simple poems; simple classical Chinese and ancient prose for me.

2.11 What simple short novels and fictions; simple poems; grammar; simple classical Chinese and ancient prose do you like?

2.12 May I befriend and communicate with native speakers and fellow learners?

2.13 How to write Chinese short paragraphs.

2.14 How may I have my self-written Chinese paragraphs corrected?

3.1 Please explain long novels, ancient poems, literature history, original complex form of Chinese characters, ancient characters and Chinese calligraphy for me.

3.2 What is the meaning, origin of long novels, ancient poems, literature history, the original complex form of Chinese characters, ancient characters and Chinese calligraphy.

3.3 Please recommend suitable long novels, ancient poems, literature history, original complex form of Chinese characters, ancient characters and Chinese calligraphy for me.

3.4 How to find a Chinese related job?

3.5 Do you like what long novels, ancient poems, literature history, original complex form of Chinese characters, ancient characters and Chinese calligraphy?

3.6 How to create and write Chinese short novels and fictions; simple poems; simple classical Chinese and ancient prose?

3.7 How may I have my works published or corrected?

3.8 How may I contact Chinese language experts?

3.9 What classical literature history, great classical literature works, Chinese dialects etc. do you like?

3.10 Please give your opinions of classical literature history, great classical literature works, Chinese dialects etc.

3.11 Please recommend classical literature history, great classical literature works, Chinese dialects etc. for me.

3.12 How to form and join various Chinese literature society and association.

3.13 How to write novels, prose, poems etc.

3.14 How to have my novels, prose, and poems published.

3.15 How to contact famous writers and scholars.

3.16 How may I find a better Chinese language related job?

1.5.3 Horizontally related courses and programmes

Japanese, Korean, Thai, Vietnamese etc. language learning.

1.5.4 Vertically related courses and programmes

Chinese music, songs, arts, sculptures, dancing, sports, politics, economy, history, architecture, media, culture, military, legal system etc.

1.5.5 Complementary courses, programmes or products

Free Chinese learning software, Chinese learning resources directory, self-learning materials and software, work and language learning programme, Chinese Universities' information, traditional Chinese learning directory.

1.5.6 Supplementary courses, programmes or products

Chinese pronunciation fast courses, Chinese costumes, Chinese pens, Chinese papers, Chinese musical instruments, Chinese custom introductory courses, Chinese dictionaries, Chinese maps, Chinese travel information, Chinese airlines etc.

2. Methodology

2.1 Quantitative, Qualitative and Case Studies

2.1.1 Four Different Views of the Nature of Mathematics

There are four different views with respect to the nature of mathematics and its role in sciences. The functionalist paradigm views mathematics as discoveries about a special realm of objects that exist prior to our knowledge of them. The interpretive paradigm views mathematics as a social invention and mathematical proofs as only one part of a larger social process whereby mathematicians come to feel confident about a theorem. The radical humanist paradigm views mathematics as constituting the core of science and that the rationality of science and technology is immanently one of control: the rationality of domination over nature and man. The radical structuralist paradigm

views mathematics as being historically specific and class determined, that is, to satisfy the requirements of a social class in an historical period. (Ardalan 2005)

The researcher's methods are the mixture of the above four views, but more weights have been located to the first three paradigms.

Viewing the learning assessment from different subject, area, time, space, angles and perspective might give researchers fresh thinking about the same subject by temporarily relaxing taking-for-granted assumptions and point of views.

2.1.2 Quantitative, Qualitative, Classical 'Positivistic' Design and Case Studies

A research methodology will be decided upon which at this point in time is likely to be a hybrid of quantitative, qualitative, case study and classical 'positivistic' design with which data will be gathered by reliable sources and as objective as possible means. Walliman (2001)'s and Stake (1995)'s book will be used. The gathered information will be quantified and analysed. Its trends, pattern and peculiarity will be explored. Reliability will be tested. The data will be collected using all the safeguards exercised by researchers with respect to reliability, validity and sensitivity of the questions.

Explanatory cases are proper for doing causal studies. In very complicated and multivariate cases, the analysis can make use of pattern-matching methods. (Yin and Moore 1988) It is suitable for the researcher's study.

Yin (1994, p. 20) identified five components of research design that are important for case studies:

1. A study's questions
2. Its hypotheses
3. Its unit(s) of analysis
4. The logic linking the data to the hypotheses

5. The categories for explain the findings

The researcher used this procedure for my research.

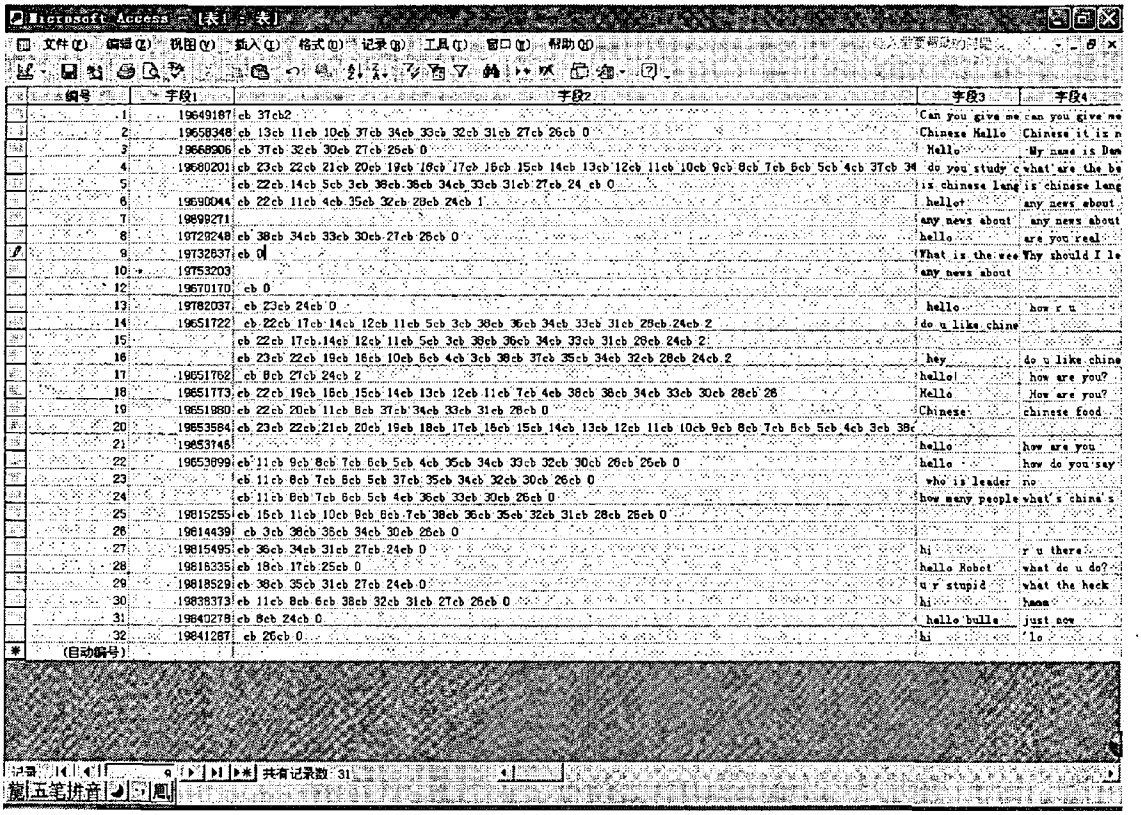
(Yin, 1989) recommended the selection that offers the opportunity to maximize what can be learned if knowing that time is not enough. Hence the cases that are selected should be easy and willing subjects. A good instrumental case does not have to defend its typicality.

Analytic methods of rearranging the arrays, placing the evidence in a matrix of categories, creating flowcharts or data displays, tabulating the frequency of different events, using means, variances and cross tabulations to examine the relationships between variables etc are suitable for case studies. (Miles & Huberman 1984)

2.1.3 Detailed Quantitative Analysis

2.1.3.1 the Chinese language learning survey and assessment collected data

Below is the screenshots of my Microsoft Access database:


Microsoft Access - [表1 : 表]
文件(F) 编辑(E) 视图(V) 插入(I) 格式(O) 记录(R) 工具(T) 窗口(W) 帮助(H)
编号 字段1 字段2 字段3 字段4
1 19649187 cb 37cb2 Can you give me can you give me
2 19658348 cb 13cb 11cb 10cb 37cb 34cb 33cb 32cb 31cb 27cb 26cb 0 Chinese Hello Chinese it is n
3 19668906 cb 37cb 32cb 30cb 27cb 26cb 0 Hello My name is Dan
4 19680201 cb 23cb 22cb 21cb 20cb 19cb 18cb 17cb 16cb 15cb 14cb 13cb 12cb 11cb 10cb 9cb 8cb 7cb 6cb 5cb 4cb 3Tcb 34 do you study c what are the bi
5 cb 22cb 14cb 5cb 3cb 38cb 36cb 34cb 33cb 31cb 27cb 24 cb 0 is chinese lang is chinese lang
6 19690044 cb 22cb 11cb 4cb 35cb 32cb 28cb 24cb 1 hello! any news about
7 19899271 any news about any news about
8 19729248 cb 38cb 34cb 33cb 30cb 27cb 26cb 0 hello are you real
9 19732637 cb 0 What is the wee Why should I le
10 19753203 any news about
12 19670170 cb 0
13 19782037 cb 23cb 24cb 0 hello how r u
14 19651722 cb 22cb 17cb 14cb 12cb 11cb 5cb 3cb 38cb 36cb 34cb 33cb 31cb 29cb 24cb 2 do u like chine
15 cb 22cb 17cb 14cb 12cb 11cb 5cb 3cb 38cb 36cb 34cb 33cb 31cb 29cb 24cb 2
16 cb 23cb 22cb 19cb 18cb 10cb 8cb 4cb 3cb 38cb 37cb 35cb 34cb 32cb 28cb 24cb 2 hey do u like chine
17 19651762 cb 8cb 27cb 24cb 2 hello! how are you?
18 19651773 cb 22cb 19cb 18cb 15cb 14cb 13cb 12cb 11cb 7cb 4cb 38cb 38cb 34cb 33cb 30cb 28cb 26 Hello How are you?
19 19651980 cb 22cb 20cb 11cb 8cb 37cb 34cb 33cb 31cb 26cb 0 Chinese chinese food
20 19653584 cb 23cb 22cb 21cb 20cb 19cb 18cb 17cb 16cb 15cb 14cb 13cb 12cb 11cb 10cb 9cb 8cb 7cb 6cb 5cb 4cb 3cb 38
21 19653148 hello how are you
22 19653099 cb 11cb 9cb 8cb 7cb 6cb 5cb 4cb 35cb 34cb 33cb 32cb 30cb 26cb 26cb 0 hello how do you say
23 cb 11cb 8cb 7cb 6cb 5cb 37cb 35cb 34cb 32cb 30cb 26cb 0 who is leader no
24 cb 11cb 8cb 7cb 6cb 5cb 4cb 36cb 33cb 30cb 26cb 0 how many people what's china's
25 19815255 cb 15cb 11cb 10cb 9cb 8cb 7cb 38cb 36cb 35cb 32cb 31cb 28cb 26cb 0
26 19814439 cb 3cb 38cb 36cb 34cb 30cb 26cb 0
27 19815495 cb 36cb 34cb 31cb 27cb 24cb 0 hi r u there
28 19816335 cb 18cb 17cb 25cb 0 hello Robot what do u do?
29 19818529 cb 38cb 35cb 31cb 27cb 24cb 0 u r stupid what the heck
30 19838373 cb 11cb 8cb 6cb 38cb 32cb 31cb 27cb 26cb 0 hi haaa
31 19840278 cb 8cb 24cb 0 hello bulls just now
32 19841287 cb 26cb 0 hi lo
(自动编号)
记录: 共有记录数: 31
智能五笔拼音

Level of Chinese	The Questions belong to which level of Chinese proficiency from 1 to three. Zero means that the questions are not related to the proficiency of Chinese language
three	2 2 2 2 1 2 3 3 3 3 3 2 2 1 2 2 2 3 2 2 3 3 3 2 2 2 3 2 3 2 2 2 3
one	0 1 1 1 1
one	0 1 1 1 0
three	1 0
one	1 1
two	0 3 2 0 2 0 0 2 0 0 2 0 0 1 0 2 0 0 0
one	0 0 0 1 1
one	1 1 1
two	2 2 0 2
two	1 0 0 2 1 2
one	0 0 1 0
Three	0 3
Three	0 3 3 0 0
three	0 2 2 3 3 3 2 0 0 0 3 3
Three	0 0 0 0 3 0 0 0 0 0 0 0
Three	0 0 2 2 3 3 3 3 2 2 2 3 2 2 2 2 3
one	0 1 1 1 1 1 2 2 0 1 0 0 0 0 0 1 1 1 2 0 0 1 0 0 0 0 0
one	0 0 0 1
one	0 1 0 0
one	0 1 0 0 1 0 1 0 0 0 0 0 0 0
one	2 0 0 0 0 1 0 1
one	1 1 1 2 1 1 1 1 0 1 2 0
one	1 0 0 1 1
one	1 0 1 1 0 2
one	0 1 0 1
one	0 1 1 0
one	0 0 0 0 0 0 1 1 0 0 0
one	0 1 0 0 0 0 0 2 1 1 0 0 0 0 1 0 0 1 1 0 0 0 0 0 0 0 0 0 0 0 0 1 0
one	0 1 1 1 1 0 0 0 0 0 1 0 0 0 0 1 1 0 2
one	0 1 2 2

2.1.3.2 Use Bayes simplified formula to calculate the possibility of level 1, level2 and level 3 of Chinese language proficiency when the level 1, level 2 and level 3 questions appear.

Set L1 = level 1 proficiency; L2 = level 2 proficiency; L3 = level 3 proficiency; Q1 = level 1 questions; Q2 = level 2 questions; Q3 = level 3 questions;

P(L1| Q1) = (P(Q1|L1)*P(L1)) / ((P(Q1|L1)*P(L1)+ (P(Q1|L2)*P(L2)+(P(Q1|L3)*P(L3))

There are total 76 questions asked by level 1 users (according to the survey checkboxes they ticked). Of these, 9 questions are not level 1 questions, so P(Q1|L1) = 67/76 = 0.8816. P(L1) = 1/3. There are total 14 questions asked by level 2 users. Of these, 3 questions are level 1 questions. (P(Q1|L2) = 3/14. There are total 61 questions asked by level 3 users. Of these, 5 questions are level 1 questions. (P(Q1|L3) = 5/61.

P(L1| Q1) = (67/76 * 1/3) / (67/76 *0.333 + 3/14*0.333 + 5/61*0.333) = (0.8816 * 0.333) / (0.8816/3 + 0.2143/3 + 0.082/3) = 0.29387/0.3926 = 0.749

P(L2| Q2) = (P(Q2|L2)*P(L2)) / ((P(Q2|L1)*P(L1)+ (P(Q2|L2)*P(L2)+(P(Q2|L3)*P(L3))

= (10/14 * 1/3) / (9/76 *0.333 + 10/14*0.333 + 30/61*0.333) = (0.714 * 0.333) / (0.118/3 + 0.714/3 + 0.49/3) = 0.238/0.44 = 0.54

P(L3| Q3) = (P(Q3|L3)*P(L3)) / ((P(Q3|L1)*P(L1)+ (P(Q3|L2)*P(L2)+(P(Q3|L3)*P(L3))

= (26/61 * 1/3) / (0 + 1/14*0.333 + 26/61*0.333) = (0.426 * 0.333) / (0 + 0.0714/3 + 0.426/3) = 0.146/0.1658 = 0.88

So conclusively P(L1| Q1) = 0.749; P(L2| Q2) = 0.54; P(L3| Q3) = 0.88. When a user asked level 1 questions or mostly level 1 question, we may estimate the possibility that the user is a level 1 user according to my Chinese language learning survey and assessment sample. We may also estimate the possibilities that the user is a level 2 or level 3 learner if the user asked some but not most level 2 or level 3 questions. For example, an user asked 2 level 1 questions and 1 level 2 question, then we may use the P(L1| Q1) = 0.749; P(L2| Q2) = 0.54

According to the sample.

P(L1|userX) = 2/3 * 0.749 = 0.5
P(L2|userX) = 1/3 * 0.54 = 0.18.

2.1.3.3 Calculate the statistics of the data collected

Below is the occurrence data that has removed the irrelevant data of "0" that might interfere the correct interpretation and analysis of the data.

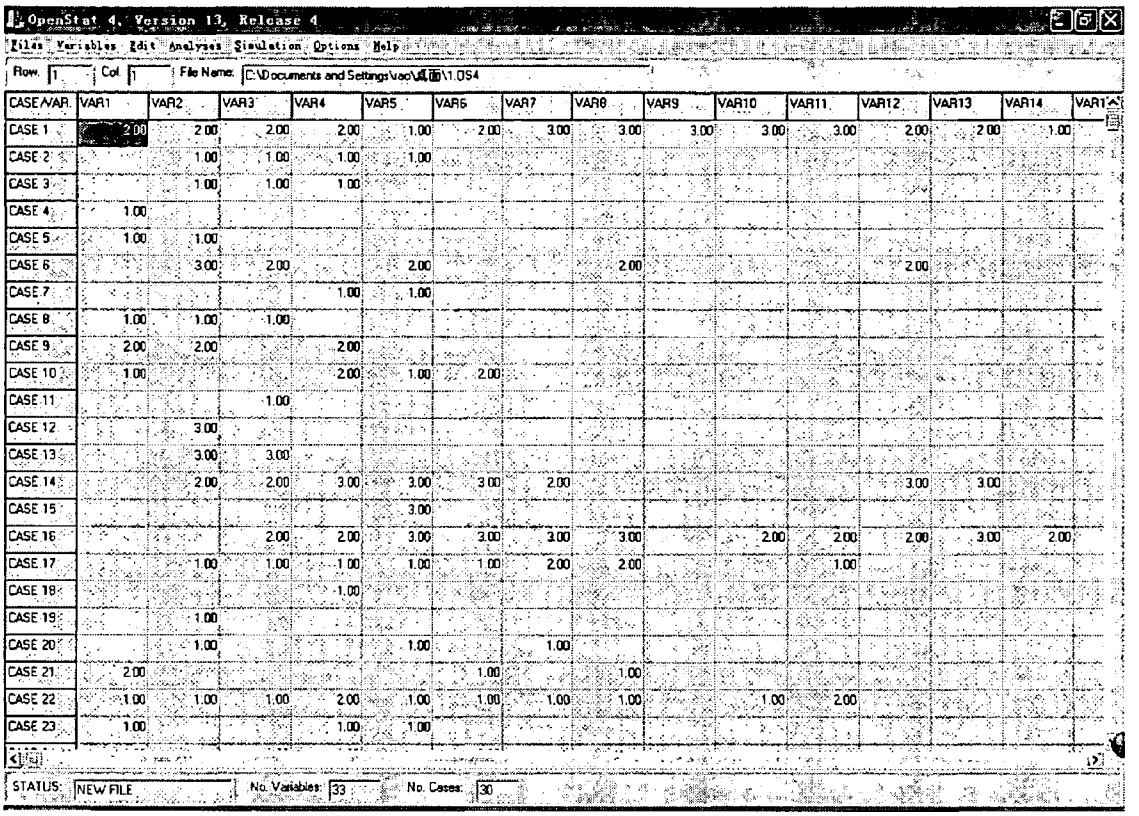
2	2	2	2	1	2	3	3	3	3	3	2	2	1	2	2	2	3	2	2	3	3	3	2	2	2	3	2	3	2	2	2	3
	1	1	1	1																												
	1	1	1																													
1																																
1	1																															
	3	2		2			2				2			1		2																
			1	1																												
1	1	1																														
2	2		2																													
1			2	1	2																											
		1																														
	3																															
	3	3																														
	2	2	3	3	3	2					3	3																				
				3																												
		2	2	3	3	3	3		2	2	2	3	2	2	2	2	3															
	1	1	1	1	1	2	2			1						1	1	1	2			1										
			1																													
	1																															
	1			1		1																										
2					1		1																									
1	1	1	2	1	1	1	1		1	2																						
1			1	1																												
1		1	1		2																											
	1		1																													
	1	1																														
						1	1																									
	1						2	1	1					1			1	1												1	
	1	1	1	1						1					1	1		2													
	1	2	2																													

1	1	1	1	1	1	1	1	1	1	1
1	1	1	1	1	1	1	1	1	1	1
1	1	1	1	1	1	1	1	1	1	1
1	1	1	1	1	1	1	1	1	1	1
1	1	1	1	1	1	1	1	1	1	1
1	1	1	1	1	1	1	1	1	1	1
1	1	1	1	1	1	1	1	1	3	3
3	3	3	3	3	3	3	3	3	3	3
3	3	3	3	3	3	3	3	3	3	3
3	3	3	2	2	2	2	2	2	2	2
2	2	2	2	2	2	2	2	2	2	2
2	2	2	2	2	2	2	2	2	2	2
2	2	2	2	2	2	2	2	2	2	2
2	2	2	2	2	2	2	2			

This is the adjusted level questions occurrence frequency table.

Total questions = 151. Level1 questions = 75. Level2 questions = 49. Level3 questions = 27.

Below is the screenshot of the researcher's OS4 data. The column cases are for different users and the row variables are for the questions users asked the robot. For the details of the OpenStat4 software, please check the appendices.



The below distribution parameter estimates are for every variable's (the same ordinal number questions asked by all the users at some point of time) distribution.

DISTRIBUTION PARAMETER ESTIMATES

VAR1 (N = 10) Sum = 13.000
Mean = 1.300 Variance = 0.233 Std.Dev. = 0.483
Std.Error of Mean = 0.153
Range = 1.000 Minimum = 1.000 Maximum = 2.000
Skewness = 1.035 Std. Error of Skew = 0.687
Kurtosis = -1.224 Std. Error Kurtosis = 1.334

VAR2 (N = 19) Sum = 28.000
Mean = 1.474 Variance = 0.596 Std.Dev. = 0.772
Std.Error of Mean = 0.177
Range = 2.000 Minimum = 1.000 Maximum = 3.000
Skewness = 1.310 Std. Error of Skew = 0.524
Kurtosis = 0.171 Std. Error Kurtosis = 1.014

VAR3 (N = 15) Sum = 21.000
Mean = 1.400 Variance = 0.400 Std.Dev. = 0.632
Std.Error of Mean = 0.163
Range = 2.000 Minimum = 1.000 Maximum = 3.000
Skewness = 1.407 Std. Error of Skew = 0.580
Kurtosis = 1.264 Std. Error Kurtosis = 1.121

VAR4 (N = 16) Sum = 24.000
Mean = 1.500 Variance = 0.400 Std.Dev. = 0.632
Std.Error of Mean = 0.158
Range = 2.000 Minimum = 1.000 Maximum = 3.000
Skewness = 0.904 Std. Error of Skew = 0.564
Kurtosis = 0.027 Std. Error Kurtosis = 1.091

VAR5 (N = 13) Sum = 20.000
Mean = 1.538 Variance = 0.769 Std.Dev. = 0.877
Std.Error of Mean = 0.243
Range = 2.000 Minimum = 1.000 Maximum = 3.000
Skewness = 1.176 Std. Error of Skew = 0.616
Kurtosis = -0.551 Std. Error Kurtosis = 1.191

VAR6 (N = 8) Sum = 15.000
Mean = 1.875 Variance = 0.696 Std.Dev. = 0.835
Std.Error of Mean = 0.295
Range = 2.000 Minimum = 1.000 Maximum = 3.000
Skewness = 0.277 Std. Error of Skew = 0.752
Kurtosis = -1.392 Std. Error Kurtosis = 1.481

VAR7 (N = 7) Sum = 13.000
Mean = 1.857 Variance = 0.810 Std.Dev. = 0.900
Std.Error of Mean = 0.340
Range = 2.000 Minimum = 1.000 Maximum = 3.000
Skewness = 0.353 Std. Error of Skew = 0.794
Kurtosis = -1.817 Std. Error Kurtosis = 1.587

VAR8 (N = 8) Sum = 15.000
Mean = 1.875 Variance = 0.696 Std.Dev. = 0.835
Std.Error of Mean = 0.295
Range = 2.000 Minimum = 1.000 Maximum = 3.000
Skewness = 0.277 Std. Error of Skew = 0.752

```
Kurtosis =     -1.392  Std. Error Kurtosis =      1.481

VAR9 (N = 2)  Sum =          4.000
Mean =      2.000  Variance =      2.000  Std.Dev. =      1.414
Std.Error of Mean =      1.000
Range =      2.000  Minimum =      1.000  Maximum =      3.000
Skewness =      0.000  Std. Error of Skew =      0.000
Kurtosis =      0.000  Std. Error Kurtosis =      0.000

VAR10 (N = 4)  Sum =          7.000
Mean =      1.750  Variance =      0.917  Std.Dev. =      0.957
Std.Error of Mean =      0.479
Range =      2.000  Minimum =      1.000  Maximum =      3.000
Skewness =      0.855  Std. Error of Skew =      1.014
Kurtosis =     -1.289  Std. Error Kurtosis =      2.619

VAR11 (N = 5)  Sum =          9.000
Mean =      1.800  Variance =      0.700  Std.Dev. =      0.837
Std.Error of Mean =      0.374
Range =      2.000  Minimum =      1.000  Maximum =      3.000
Skewness =      0.512  Std. Error of Skew =      0.913
Kurtosis =     -0.612  Std. Error Kurtosis =      2.000

VAR12 (N = 4)  Sum =          9.000
Mean =      2.250  Variance =      0.250  Std.Dev. =      0.500
Std.Error of Mean =      0.250
Range =      1.000  Minimum =      2.000  Maximum =      3.000
Skewness =      2.000  Std. Error of Skew =      1.014
Kurtosis =      4.000  Std. Error Kurtosis =      2.619

VAR13 (N = 3)  Sum =          8.000
Mean =      2.667  Variance =      0.333  Std.Dev. =      0.577
Std.Error of Mean =      0.333
Range =      1.000  Minimum =      2.000  Maximum =      3.000
Skewness =      0.000  Std. Error of Skew =      0.000
Kurtosis =      0.000  Std. Error Kurtosis =      0.000

VAR14 (N = 2)  Sum =          3.000
Mean =      1.500  Variance =      0.500  Std.Dev. =      0.707
Std.Error of Mean =      0.500
Range =      1.000  Minimum =      1.000  Maximum =      2.000
```

```
Skewness =      0.000  Std. Error of Skew =      0.000
Kurtosis =      0.000  Std. Error Kurtosis =      0.000

VAR15 (N = 4)  Sum =          6.000
Mean =      1.500  Variance =      0.333  Std.Dev. =      0.577
Std.Error of Mean =      0.289
Range =      1.000  Minimum =      1.000  Maximum =      2.000
Skewness =      0.000  Std. Error of Skew =      1.014
Kurtosis =     -6.000  Std. Error Kurtosis =      2.619

VAR16 (N = 3)  Sum =          5.000
Mean =      1.667  Variance =      0.333  Std.Dev. =      0.577
Std.Error of Mean =      0.333
Range =      1.000  Minimum =      1.000  Maximum =      2.000
Skewness =      0.000  Std. Error of Skew =      0.000
Kurtosis =      0.000  Std. Error Kurtosis =      0.000

VAR17 (N = 5)  Sum =          8.000
Mean =      1.600  Variance =      0.300  Std.Dev. =      0.548
Std.Error of Mean =      0.245
Range =      1.000  Minimum =      1.000  Maximum =      2.000
Skewness =     -0.609  Std. Error of Skew =      0.913
Kurtosis =     -3.333  Std. Error Kurtosis =      2.000

VAR18 (N = 4)  Sum =          8.000
Mean =      2.000  Variance =      1.333  Std.Dev. =      1.155
Std.Error of Mean =      0.577
Range =      2.000  Minimum =      1.000  Maximum =      3.000
Skewness =      0.000  Std. Error of Skew =      1.014
Kurtosis =     -6.000  Std. Error Kurtosis =      2.619

VAR19 (N = 4)  Sum =          6.000
Mean =      1.500  Variance =      0.333  Std.Dev. =      0.577
Std.Error of Mean =      0.289
Range =      1.000  Minimum =      1.000  Maximum =      2.000
Skewness =      0.000  Std. Error of Skew =      1.014
Kurtosis =     -6.000  Std. Error Kurtosis =      2.619

VAR20 (N = 2)  Sum =          4.000
Mean =      2.000  Variance =      0.000  Std.Dev. =      0.000
Std.Error of Mean =      0.000
```

```
Range =      0.000  Minimum =      2.000  Maximum =      2.000
Skewness =      0.000  Std. Error of Skew =      0.000
Kurtosis =      0.000  Std. Error Kurtosis =      0.000

VAR21 (N = 1)  Sum =          3.000
Mean =      3.000  Variance =      9.000  Std.Dev. =      0.000
Std.Error of Mean =      0.000
Range =      0.000  Minimum =      3.000  Maximum =      3.000
Skewness =      0.000  Std. Error of Skew =      0.000
Kurtosis =      0.000  Std. Error Kurtosis =      0.000

VAR22 (N = 1)  Sum =          3.000
Mean =      3.000  Variance =      9.000  Std.Dev. =      0.000
Std.Error of Mean =      0.000
Range =      0.000  Minimum =      3.000  Maximum =      3.000
Skewness =      0.000  Std. Error of Skew =      0.000
Kurtosis =      0.000  Std. Error Kurtosis =      0.000

VAR23 (N = 2)  Sum =          4.000
Mean =      2.000  Variance =      2.000  Std.Dev. =      1.414
Std.Error of Mean =      1.000
Range =      2.000  Minimum =      1.000  Maximum =      3.000
Skewness =      0.000  Std. Error of Skew =      0.000
Kurtosis =      0.000  Std. Error Kurtosis =      0.000

VAR24 (N = 1)  Sum =          2.000
Mean =      2.000  Variance =      4.000  Std.Dev. =      0.000
Std.Error of Mean =      1.000
Range =      0.000  Minimum =      2.000  Maximum =      2.000
Skewness =      0.000  Std. Error of Skew =      0.000
Kurtosis =      0.000  Std. Error Kurtosis =      0.000

VAR25 (N = 1)  Sum =          2.000
Mean =      2.000  Variance =      4.000  Std.Dev. =      0.000
Std.Error of Mean =      1.000
Range =      0.000  Minimum =      2.000  Maximum =      2.000
Skewness =      0.000  Std. Error of Skew =      0.000
Kurtosis =      0.000  Std. Error Kurtosis =      0.000

VAR26 (N = 1)  Sum =          2.000
Mean =      2.000  Variance =      4.000  Std.Dev. =      0.000
```

```
Std.Error of Mean =      1.000
Range =      0.000  Minimum =      2.000  Maximum =      2.000
Skewness =      0.000  Std. Error of Skew =      0.000
Kurtosis =      0.000  Std. Error Kurtosis =      0.000

VAR27 (N = 1)  Sum =          3.000
Mean =      3.000  Variance =      9.000  Std.Dev. =      0.000
Std.Error of Mean =      1.000
Range =      0.000  Minimum =      3.000  Maximum =      3.000
Skewness =      0.000  Std. Error of Skew =      0.000
Kurtosis =      0.000  Std. Error Kurtosis =      0.000

VAR28 (N = 1)  Sum =          2.000
Mean =      2.000  Variance =      4.000  Std.Dev. =      0.000
Std.Error of Mean =      1.000
Range =      0.000  Minimum =      2.000  Maximum =      2.000
Skewness =      0.000  Std. Error of Skew =      0.000
Kurtosis =      0.000  Std. Error Kurtosis =      0.000

VAR29 (N = 1)  Sum =          3.000
Mean =      3.000  Variance =      9.000  Std.Dev. =      0.000
Std.Error of Mean =      1.000
Range =      0.000  Minimum =      3.000  Maximum =      3.000
Skewness =      0.000  Std. Error of Skew =      0.000
Kurtosis =      0.000  Std. Error Kurtosis =      0.000

VAR30 (N = 1)  Sum =          2.000
Mean =      2.000  Variance =      4.000  Std.Dev. =      0.000
Std.Error of Mean =      1.000
Range =      0.000  Minimum =      2.000  Maximum =      2.000
Skewness =      0.000  Std. Error of Skew =      0.000
Kurtosis =      0.000  Std. Error Kurtosis =      0.000

VAR31 (N = 1)  Sum =          2.000
Mean =      2.000  Variance =      4.000  Std.Dev. =      0.000
Std.Error of Mean =      1.000
Range =      0.000  Minimum =      2.000  Maximum =      2.000
Skewness =      0.000  Std. Error of Skew =      0.000
Kurtosis =      0.000  Std. Error Kurtosis =      0.000

VAR32 (N = 2)  Sum =          3.000
```

Mean = 1.500 Variance = 0.500 Std.Dev. = 0.707
Std.Error of Mean = 0.500
Range = 1.000 Minimum = 1.000 Maximum = 2.000
Skewness = 0.000 Std. Error of Skew = 0.000
Kurtosis = 0.000 Std. Error Kurtosis = 0.000

VAR33 (N = 1) Sum = 3.000
Mean = 3.000 Variance = 9.000 Std.Dev. = 0.000
Std.Error of Mean = 0.500
Range = 0.000 Minimum = 3.000 Maximum = 3.000
Skewness = 0.000 Std. Error of Skew = 0.000
Kurtosis = 0.000 Std. Error Kurtosis = 0.000

Following is the correlation matrix among different variables and their means and standard deviations.

GUMJML (Adapted from the original FORTRAN program written by James S. Roberts)

No. Cases = 18, No. Items = 33

CORRELATION MATRIX

Correlations

	VAR1	VAR2	VAR3	VAR4	VAR5	VAR6
VAR1	1.000	-0.108	0.040	0.263	-0.154	0.339
VAR2	-0.108	1.000	0.491	-0.202	-0.074	-0.208
VAR3	0.040	0.491	1.000	0.300	0.264	0.374
VAR4	0.263	-0.202	0.300	1.000	0.383	0.788
VAR5	-0.154	-0.074	0.264	0.383	1.000	0.552
VAR6	0.339	-0.208	0.374	0.788	0.552	1.000
VAR7	0.289	0.018	0.455	0.614	0.573	0.740

VAR8	0.241	0.112	0.380	0.222	0.367
0.385					
VAR9	0.588	0.180	0.190	0.192	-0.023
0.222					
VAR10	0.487	-0.011	0.324	0.391	0.251
0.488					
VAR11	0.557	-0.010	0.369	0.488	0.288
0.509					
VAR12	0.049	0.315	0.605	0.525	0.701
0.662					
VAR13	0.083	0.036	0.509	0.657	0.655
0.813					
VAR14	0.157	-0.164	0.386	0.373	0.447
0.592					
VAR15	0.235	0.082	0.396	0.224	0.373
0.431					
VAR16	0.366	-0.058	0.410	0.395	0.369
0.574					
VAR17	0.210	0.221	0.518	0.200	0.467
0.385					
VAR18	0.324	-0.067	0.346	0.340	0.322
0.530					
VAR19	0.533	0.164	0.142	0.149	-0.050
0.186					
VAR20	0.662	0.199	0.281	0.271	0.036
0.283					
VAR21	0.662	0.199	0.281	0.271	0.036
0.283					
VAR22	0.662	0.199	0.281	0.271	0.036
0.283					
VAR23	0.662	0.199	0.281	0.271	0.036
0.283					
VAR24	0.662	0.199	0.281	0.271	0.036
0.283					
VAR25	0.662	0.199	0.281	0.271	0.036
0.283					
VAR26	0.662	0.199	0.281	0.271	0.036
0.283					
VAR27	0.662	0.199	0.281	0.271	0.036
0.283					

VAR28	0.662	0.199	0.281	0.271	0.036
0.283					
VAR29	0.662	0.199	0.281	0.271	0.036
0.283					
VAR30	0.662	0.199	0.281	0.271	0.036
0.283					
VAR31	0.662	0.199	0.281	0.271	0.036
0.283					
VAR32	0.533	0.164	0.142	0.149	-0.050
0.186					
VAR33	0.662	0.199	0.281	0.271	0.036
0.283					

Correlations

	VAR7	VAR8	VAR9	VAR10	VAR11
VAR12					
VAR1	0.289	0.241	0.588	0.487	0.557
0.049					
VAR2	0.018	0.112	0.180	-0.011	-0.010
0.315					
VAR3	0.455	0.380	0.190	0.324	0.369
0.605					
VAR4	0.614	0.222	0.192	0.391	0.488
0.525					
VAR5	0.573	0.367	-0.023	0.251	0.288
0.701					
VAR6	0.740	0.385	0.222	0.488	0.509
0.662					
VAR7	1.000	0.666	0.523	0.805	0.808
0.745					
VAR8	0.666	1.000	0.629	0.870	0.748
0.574					
VAR9	0.523	0.629	1.000	0.798	0.653
0.326					
VAR10	0.805	0.870	0.798	1.000	0.927
0.457					
VAR11	0.808	0.748	0.653	0.927	1.000
0.423					
VAR12	0.745	0.574	0.326	0.457	0.423
1.000					
VAR13	0.898	0.523	0.326	0.591	0.548
0.860					

VAR14	0.805	0.750	0.364	0.785	0.728
0.522					
VAR15	0.713	0.968	0.664	0.874	0.717
0.609					
VAR16	0.854	0.796	0.635	0.904	0.838
0.554					
VAR17	0.638	0.866	0.489	0.692	0.642
0.701					
VAR18	0.814	0.865	0.693	0.939	0.805
0.519					
VAR19	0.476	0.646	0.989	0.785	0.603
0.290					
VAR20	0.586	0.546	0.947	0.767	0.711
0.380					
VAR21	0.586	0.546	0.947	0.767	0.711
0.380					
VAR22	0.586	0.546	0.947	0.767	0.711
0.380					
VAR23	0.586	0.546	0.947	0.767	0.711
0.380					
VAR24	0.586	0.546	0.947	0.767	0.711
0.380					
VAR25	0.586	0.546	0.947	0.767	0.711
0.380					
VAR26	0.586	0.546	0.947	0.767	0.711
0.380					
VAR27	0.586	0.546	0.947	0.767	0.711
0.380					
VAR28	0.586	0.546	0.947	0.767	0.711
0.380					
VAR29	0.586	0.546	0.947	0.767	0.711
0.380					
VAR30	0.586	0.546	0.947	0.767	0.711
0.380					
VAR31	0.586	0.546	0.947	0.767	0.711
0.380					
VAR32	0.476	0.646	0.989	0.785	0.603
0.290					
VAR33	0.586	0.546	0.947	0.767	0.711
0.380					

Correlations

	VAR13	VAR14	VAR15	VAR16	VAR17	VAR18
VAR1	0.083	0.157	0.235	0.366	0.210	0.324
VAR2	0.036	-0.164	0.082	-0.058	0.221	-0.067
VAR3	0.509	0.386	0.396	0.410	0.518	0.346
VAR4	0.657	0.373	0.224	0.395	0.200	0.340
VAR5	0.655	0.447	0.373	0.369	0.467	0.322
VAR6	0.813	0.592	0.431	0.574	0.385	0.530
VAR7	0.898	0.805	0.713	0.854	0.638	0.814
VAR8	0.523	0.750	0.968	0.796	0.866	0.865
VAR9	0.326	0.364	0.664	0.635	0.489	0.693
VAR10	0.591	0.785	0.874	0.904	0.692	0.939
VAR11	0.548	0.728	0.717	0.838	0.642	0.805
VAR12	0.860	0.522	0.609	0.554	0.701	0.519
VAR13	1.000	0.732	0.604	0.718	0.540	0.686
VAR14	0.732	1.000	0.833	0.943	0.745	0.915
VAR15	0.604	0.833	1.000	0.884	0.894	0.935
VAR16	0.718	0.943	0.884	1.000	0.791	0.971
VAR17	0.540	0.745	0.894	0.791	1.000	0.758
VAR18	0.686	0.915	0.935	0.971	0.758	1.000
VAR19	0.293	0.333	0.667	0.589	0.447	0.682

VAR20	0.373	0.404	0.606	0.686	0.542
0.666					
VAR21	0.373	0.404	0.606	0.686	0.542
0.666					
VAR22	0.373	0.404	0.606	0.686	0.542
0.666					
VAR23	0.373	0.404	0.606	0.686	0.542
0.666					
VAR24	0.373	0.404	0.606	0.686	0.542
0.666					
VAR25	0.373	0.404	0.606	0.686	0.542
0.666					
VAR26	0.373	0.404	0.606	0.686	0.542
0.666					
VAR27	0.373	0.404	0.606	0.686	0.542
0.666					
VAR28	0.373	0.404	0.606	0.686	0.542
0.666					
VAR29	0.373	0.404	0.606	0.686	0.542
0.666					
VAR30	0.373	0.404	0.606	0.686	0.542
0.666					
VAR31	0.373	0.404	0.606	0.686	0.542
0.666					
VAR32	0.293	0.333	0.667	0.589	0.447
0.682					
VAR33	0.373	0.404	0.606	0.686	0.542
0.666					

Correlations

	VAR19	VAR20	VAR21	VAR22	VAR23
VAR24					
VAR1	0.533	0.662	0.662	0.662	0.662
0.662					
VAR2	0.164	0.199	0.199	0.199	0.199
0.199					
VAR3	0.142	0.281	0.281	0.281	0.281
0.281					
VAR4	0.149	0.271	0.271	0.271	0.271
0.271					
VAR5	-0.050	0.036	0.036	0.036	0.036
0.036					

VAR6	0.186	0.283	0.283	0.283	0.283
0.283					
VAR7	0.476	0.586	0.586	0.586	0.586
0.586					
VAR8	0.646	0.546	0.546	0.546	0.546
0.546					
VAR9	0.989	0.947	0.947	0.947	0.947
0.947					
VAR10	0.785	0.767	0.767	0.767	0.767
0.767					
VAR11	0.603	0.711	0.711	0.711	0.711
0.711					
VAR12	0.290	0.380	0.380	0.380	0.380
0.380					
VAR13	0.293	0.373	0.373	0.373	0.373
0.373					
VAR14	0.333	0.404	0.404	0.404	0.404
0.404					
VAR15	0.667	0.606	0.606	0.606	0.606
0.606					
VAR16	0.589	0.686	0.686	0.686	0.686
0.686					
VAR17	0.447	0.542	0.542	0.542	0.542
0.542					
VAR18	0.682	0.666	0.666	0.666	0.666
0.666					
VAR19	1.000	0.889	0.889	0.889	0.889
0.889					
VAR20	0.889	1.000	1.000	1.000	1.000
1.000					
VAR21	0.889	1.000	1.000	1.000	1.000
1.000					
VAR22	0.889	1.000	1.000	1.000	1.000
1.000					
VAR23	0.889	1.000	1.000	1.000	1.000
1.000					
VAR24	0.889	1.000	1.000	1.000	1.000
1.000					
VAR25	0.889	1.000	1.000	1.000	1.000
1.000					

VAR26	0.889	1.000	1.000	1.000	1.000
1.000					
VAR27	0.889	1.000	1.000	1.000	1.000
1.000					
VAR28	0.889	1.000	1.000	1.000	1.000
1.000					
VAR29	0.889	1.000	1.000	1.000	1.000
1.000					
VAR30	0.889	1.000	1.000	1.000	1.000
1.000					
VAR31	0.889	1.000	1.000	1.000	1.000
1.000					
VAR32	1.000	0.889	0.889	0.889	0.889
0.889					
VAR33	0.889	1.000	1.000	1.000	1.000
1.000					

Correlations

	VAR25	VAR26	VAR27	VAR28	VAR29
VAR30					
VAR1	0.662	0.662	0.662	0.662	0.662
0.662					
VAR2	0.199	0.199	0.199	0.199	0.199
0.199					
VAR3	0.281	0.281	0.281	0.281	0.281
0.281					
VAR4	0.271	0.271	0.271	0.271	0.271
0.271					
VAR5	0.036	0.036	0.036	0.036	0.036
0.036					
VAR6	0.283	0.283	0.283	0.283	0.283
0.283					
VAR7	0.586	0.586	0.586	0.586	0.586
0.586					
VAR8	0.546	0.546	0.546	0.546	0.546
0.546					
VAR9	0.947	0.947	0.947	0.947	0.947
0.947					
VAR10	0.767	0.767	0.767	0.767	0.767
0.767					
VAR11	0.711	0.711	0.711	0.711	0.711
0.711					

VAR12	0.380	0.380	0.380	0.380	0.380
0.380					
VAR13	0.373	0.373	0.373	0.373	0.373
0.373					
VAR14	0.404	0.404	0.404	0.404	0.404
0.404					
VAR15	0.606	0.606	0.606	0.606	0.606
0.606					
VAR16	0.686	0.686	0.686	0.686	0.686
0.686					
VAR17	0.542	0.542	0.542	0.542	0.542
0.542					
VAR18	0.666	0.666	0.666	0.666	0.666
0.666					
VAR19	0.889	0.889	0.889	0.889	0.889
0.889					
VAR20	1.000	1.000	1.000	1.000	1.000
1.000					
VAR21	1.000	1.000	1.000	1.000	1.000
1.000					
VAR22	1.000	1.000	1.000	1.000	1.000
1.000					
VAR23	1.000	1.000	1.000	1.000	1.000
1.000					
VAR24	1.000	1.000	1.000	1.000	1.000
1.000					
VAR25	1.000	1.000	1.000	1.000	1.000
1.000					
VAR26	1.000	1.000	1.000	1.000	1.000
1.000					
VAR27	1.000	1.000	1.000	1.000	1.000
1.000					
VAR28	1.000	1.000	1.000	1.000	1.000
1.000					
VAR29	1.000	1.000	1.000	1.000	1.000
1.000					
VAR30	1.000	1.000	1.000	1.000	1.000
1.000					
VAR31	1.000	1.000	1.000	1.000	1.000
1.000					

VAR32	0.889	0.889	0.889	0.889	0.889
0.889					
VAR33	1.000	1.000	1.000	1.000	1.000
1.000					

Correlations

	VAR31	VAR32	VAR33
VAR1	0.662	0.533	0.662
VAR2	0.199	0.164	0.199
VAR3	0.281	0.142	0.281
VAR4	0.271	0.149	0.271
VAR5	0.036	-0.050	0.036
VAR6	0.283	0.186	0.283
VAR7	0.586	0.476	0.586
VAR8	0.546	0.646	0.546
VAR9	0.947	0.989	0.947
VAR10	0.767	0.785	0.767
VAR11	0.711	0.603	0.711
VAR12	0.380	0.290	0.380
VAR13	0.373	0.293	0.373
VAR14	0.404	0.333	0.404
VAR15	0.606	0.667	0.606
VAR16	0.686	0.589	0.686
VAR17	0.542	0.447	0.542
VAR18	0.666	0.682	0.666
VAR19	0.889	1.000	0.889
VAR20	1.000	0.889	1.000
VAR21	1.000	0.889	1.000
VAR22	1.000	0.889	1.000
VAR23	1.000	0.889	1.000
VAR24	1.000	0.889	1.000
VAR25	1.000	0.889	1.000
VAR26	1.000	0.889	1.000
VAR27	1.000	0.889	1.000
VAR28	1.000	0.889	1.000
VAR29	1.000	0.889	1.000
VAR30	1.000	0.889	1.000
VAR31	1.000	0.889	1.000
VAR32	0.889	1.000	0.889
VAR33	1.000	0.889	1.000

Means

Variables	VAR1	VAR2	VAR3	VAR4	VAR5	VAR6
	0.389	1.167	0.944	0.889	0.833	0.722

Variables	VAR7	VAR8	VAR9	VAR10	VAR11	VAR12
	0.556	0.611	0.222	0.389	0.389	0.500

Variables	VAR13	VAR14	VAR15	VAR16	VAR17	VAR18
	0.444	0.167	0.333	0.222	0.333	0.389

Variables	VAR19	VAR20	VAR21	VAR22	VAR23	VAR24
	0.167	0.111	0.167	0.167	0.167	0.111

Variables	VAR25	VAR26	VAR27	VAR28	VAR29	VAR30
	0.111	0.111	0.167	0.111	0.167	0.111

Variables	VAR31	VAR32	VAR33
	0.111	0.167	0.167

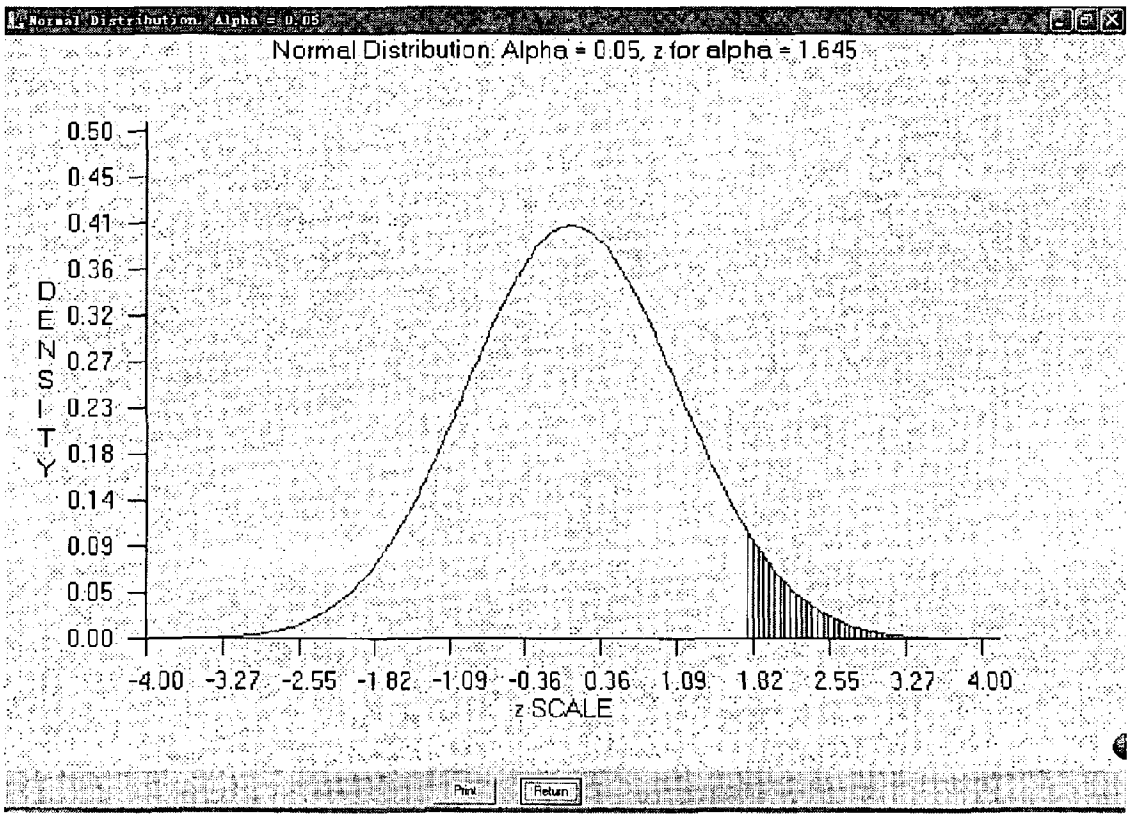
Standard Deviations

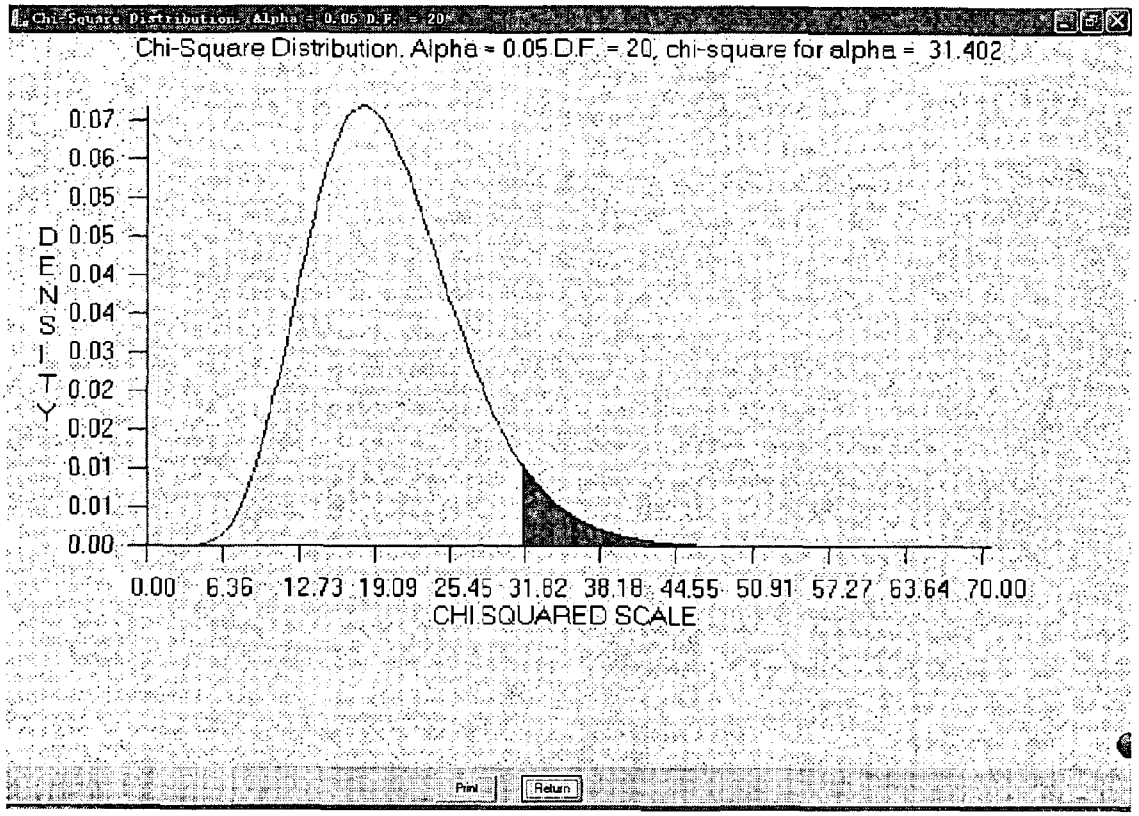
Variables	VAR1	VAR2	VAR3	VAR4	VAR5	VAR6

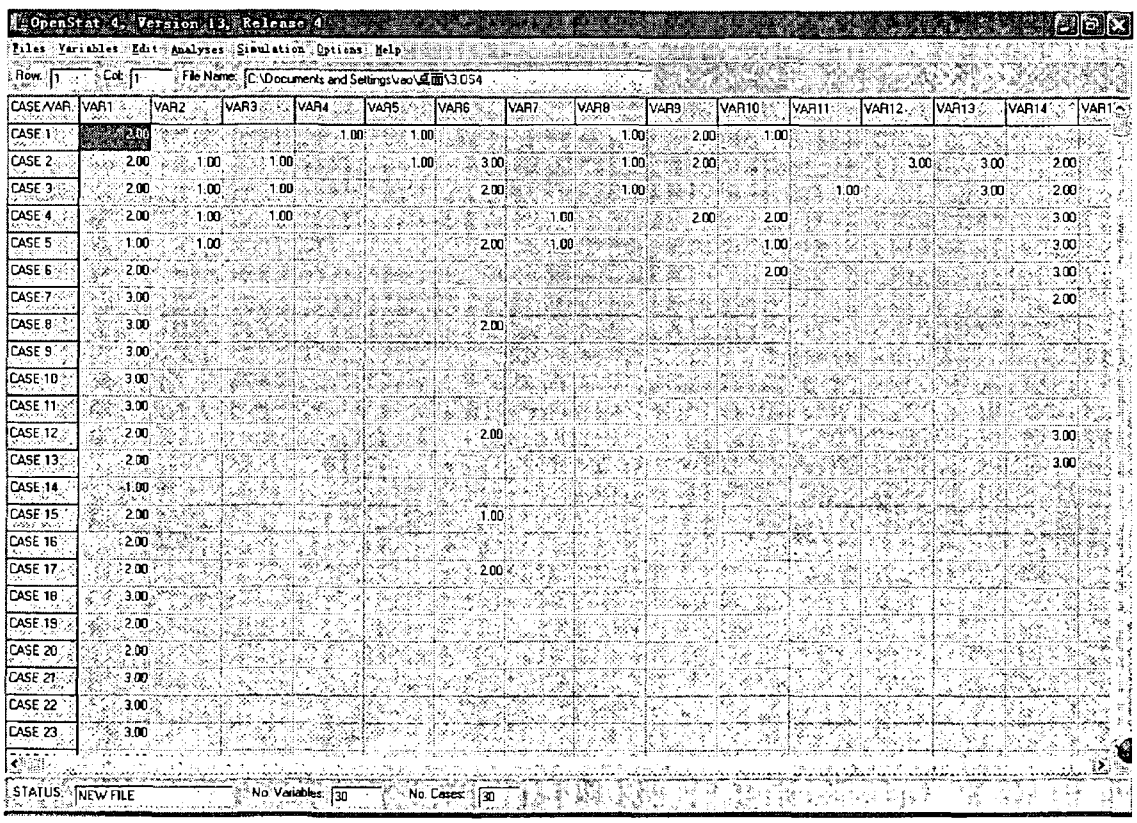
	0.608	1.043	0.938	1.023	1.150
1.127					
Variables	VAR7	VAR8	VAR9	VAR10	VAR11
VAR12					
	1.042	1.092	0.732	0.850	0.916
0.985					
Variables	VAR13	VAR14	VAR15	VAR16	VAR17
VAR18					
	1.042	0.514	0.686	0.647	0.767
0.979					
Variables	VAR19	VAR20	VAR21	VAR22	VAR23
VAR24					
	0.514	0.471	0.707	0.707	0.707
0.471					
Variables	VAR25	VAR26	VAR27	VAR28	VAR29
VAR30					
	0.471	0.471	0.707	0.471	0.707
0.471					
Variables	VAR31	VAR32	VAR33		
	0.471	0.514	0.707		

No. of valid cases = 18

Below is the z normal distribution plot graph as Alpha = 0.05 and z for alpha = 1.645 and the Chi – Square distribution graph.







CASE/VAR.	VAR1	VAR2	VAR3	VAR4	VAR5	VAR6	VAR7	VAR8	VAR9	VAR10	VAR11	VAR12	VAR13	VAR14	VAR1
CASE 1	2.00			1.00	1.00			1.00	2.00	1.00					
CASE 2	2.00	1.00	1.00		1.00	3.00		1.00	2.00			3.00	3.00	2.00	
CASE 3	2.00	1.00	1.00			2.00		1.00			1.00		3.00	2.00	
CASE 4	2.00	1.00	1.00				1.00		2.00	2.00				3.00	
CASE 5	1.00	1.00				2.00	1.00			1.00				3.00	
CASE 6	2.00									2.00				3.00	
CASE 7	3.00													2.00	
CASE 8	3.00					2.00									
CASE 9	3.00														
CASE 10	3.00														
CASE 11	3.00														
CASE 12	2.00					2.00								3.00	
CASE 13	2.00													3.00	
CASE 14	1.00														
CASE 15	2.00					1.00									
CASE 16	2.00														
CASE 17	2.00					2.00									
CASE 18	3.00														
CASE 19	2.00														
CASE 20	2.00														
CASE 21	3.00														
CASE 22	3.00														
CASE 23	3.00														

The above is the transposed and rotated OS4 database. Now the cases are the ordinal number questions all the users asked at some point of time and the variables are the according every users, so in this way the researcher can interpret and analyze every user's data against their asked questions.

```
DISTRIBUTION PARAMETER ESTIMATES

VAR1 (N = 30)  Sum =          69.000
Mean =       2.300  Variance =       0.355  Std.Dev. =       0.596
Std.Error of Mean =       0.109
Range =      2.000  Minimum =       1.000  Maximum =       3.000
Skewness =     -0.189  Std. Error of Skew =       0.427
Kurtosis =     -0.482  Std. Error Kurtosis =       0.833

VAR2 (N = 3)  Sum =          3.000
Mean =       1.000  Variance =       0.000  Std.Dev. =       0.000
Std.Error of Mean =       0.000
Range =      0.000  Minimum =       1.000  Maximum =       1.000
Skewness =       0.000  Std. Error of Skew =       0.000
Kurtosis =       0.000  Std. Error Kurtosis =       0.000

VAR3 (N = 3)  Sum =          3.000
Mean =       1.000  Variance =       0.000  Std.Dev. =       0.000
Std.Error of Mean =       0.000
Range =      0.000  Minimum =       1.000  Maximum =       1.000
Skewness =       0.000  Std. Error of Skew =       0.000
Kurtosis =       0.000  Std. Error Kurtosis =       0.000

VAR5 (N = 1)  Sum =          1.000
Mean =       1.000  Variance =       1.000  Std.Dev. =       0.000
Std.Error of Mean =       0.000
Range =      0.000  Minimum =       1.000  Maximum =       1.000
Skewness =       0.000  Std. Error of Skew =       0.000
Kurtosis =       0.000  Std. Error Kurtosis =       0.000

VAR6 (N = 1)  Sum =          3.000
Mean =       3.000  Variance =       9.000  Std.Dev. =       0.000
Std.Error of Mean =       0.000
```

```
Range =      0.000  Minimum =      3.000  Maximum =      3.000
Skewness =       0.000  Std. Error of Skew =      0.000
Kurtosis =       0.000  Std. Error Kurtosis =      0.000

VAR7 (N = 2)  Sum =          2.000
Mean =      1.000  Variance =      0.000  Std.Dev. =      0.000
Std.Error of Mean =      0.000
Range =      0.000  Minimum =      1.000  Maximum =      1.000
Skewness =       0.000  Std. Error of Skew =      0.000
Kurtosis =       0.000  Std. Error Kurtosis =      0.000

VAR8 (N = 3)  Sum =          3.000
Mean =      1.000  Variance =      0.000  Std.Dev. =      0.000
Std.Error of Mean =      0.000
Range =      0.000  Minimum =      1.000  Maximum =      1.000
Skewness =       0.000  Std. Error of Skew =      0.000
Kurtosis =       0.000  Std. Error Kurtosis =      0.000

VAR9 (N = 3)  Sum =          6.000
Mean =      2.000  Variance =      0.000  Std.Dev. =      0.000
Std.Error of Mean =      0.000
Range =      0.000  Minimum =      2.000  Maximum =      2.000
Skewness =       0.000  Std. Error of Skew =      0.000
Kurtosis =       0.000  Std. Error Kurtosis =      0.000

VAR10 (N = 4)  Sum =          6.000
Mean =      1.500  Variance =      0.333  Std.Dev. =      0.577
Std.Error of Mean =      0.289
Range =      1.000  Minimum =      1.000  Maximum =      2.000
Skewness =       0.000  Std. Error of Skew =      1.014
Kurtosis =      -6.000  Std. Error Kurtosis =      2.619

VAR11 (N = 1)  Sum =          1.000
Mean =      1.000  Variance =      1.000  Std.Dev. =      0.000
Std.Error of Mean =      0.289
Range =      0.000  Minimum =      1.000  Maximum =      1.000
Skewness =       0.000  Std. Error of Skew =      0.000
Kurtosis =       0.000  Std. Error Kurtosis =      0.000

VAR12 (N = 1)  Sum =          3.000
```

Mean = 3.000 Variance = 9.000 Std.Dev. = 0.000
Std.Error of Mean = 0.289
Range = 0.000 Minimum = 3.000 Maximum = 3.000
Skewness = 0.000 Std. Error of Skew = 0.000
Kurtosis = 0.000 Std. Error Kurtosis = 0.000

AR13 (N = 2) Sum = 6.000
Mean = 3.000 Variance = 0.000 Std.Dev. = 0.000
Std.Error of Mean = 0.000
Range = 0.000 Minimum = 3.000 Maximum = 3.000
Skewness = 0.000 Std. Error of Skew = 0.000
Kurtosis = 0.000 Std. Error Kurtosis = 0.000

VAR14 (N = 8) Sum = 21.000
Mean = 2.625 Variance = 0.268 Std.Dev. = 0.518
Std.Error of Mean = 0.183
Range = 1.000 Minimum = 2.000 Maximum = 3.000
Skewness = -0.644 Std. Error of Skew = 0.752
Kurtosis = -2.240 Std. Error Kurtosis = 1.481

VAR15 (N = 1) Sum = 3.000
Mean = 3.000 Variance = 9.000 Std.Dev. = 0.000
Std.Error of Mean = 0.183
Range = 0.000 Minimum = 3.000 Maximum = 3.000
Skewness = 0.000 Std. Error of Skew = 0.000
Kurtosis = 0.000 Std. Error Kurtosis = 0.000

VAR16 (N = 15) Sum = 36.000
Mean = 2.400 Variance = 0.257 Std.Dev. = 0.507
Std.Error of Mean = 0.131
Range = 1.000 Minimum = 2.000 Maximum = 3.000
Skewness = 0.455 Std. Error of Skew = 0.580
Kurtosis = -2.094 Std. Error Kurtosis = 1.121

VAR17 (N = 13) Sum = 16.000
Mean = 1.231 Variance = 0.192 Std.Dev. = 0.439
Std.Error of Mean = 0.122
Range = 1.000 Minimum = 1.000 Maximum = 2.000
Skewness = 1.451 Std. Error of Skew = 0.616
Kurtosis = 0.095 Std. Error Kurtosis = 1.191

VAR18 (N = 1) Sum = 1.000
Mean = 1.000 Variance = 1.000 Std.Dev. = 0.000
Std.Error of Mean = 0.122
Range = 0.000 Minimum = 1.000 Maximum = 1.000
Skewness = 0.000 Std. Error of Skew = 0.000
Kurtosis = 0.000 Std. Error Kurtosis = 0.000

AR19 (N = 1) Sum = 1.000
Mean = 1.000 Variance = 1.000 Std.Dev. = 0.000
Std.Error of Mean = 0.122
Range = 0.000 Minimum = 1.000 Maximum = 1.000
Skewness = 0.000 Std. Error of Skew = 0.000
Kurtosis = 0.000 Std. Error Kurtosis = 0.000

VAR20 (N = 3) Sum = 3.000
Mean = 1.000 Variance = 0.000 Std.Dev. = 0.000
Std.Error of Mean = 0.000
Range = 0.000 Minimum = 1.000 Maximum = 1.000
Skewness = 0.000 Std. Error of Skew = 0.000
Kurtosis = 0.000 Std. Error Kurtosis = 0.000

VAR21 (N = 3) Sum = 4.000
Mean = 1.333 Variance = 0.333 Std.Dev. = 0.577
Std.Error of Mean = 0.333
Range = 1.000 Minimum = 1.000 Maximum = 2.000
Skewness = 0.000 Std. Error of Skew = 0.000
Kurtosis = 0.000 Std. Error Kurtosis = 0.000

VAR22 (N = 10) Sum = 12.000
Mean = 1.200 Variance = 0.178 Std.Dev. = 0.422
Std.Error of Mean = 0.133
Range = 1.000 Minimum = 1.000 Maximum = 2.000
Skewness = 1.779 Std. Error of Skew = 0.687
Kurtosis = 1.406 Std. Error Kurtosis = 1.334

VAR23 (N = 3) Sum = 3.000
Mean = 1.000 Variance = 0.000 Std.Dev. = 0.000
Std.Error of Mean = 0.000
Range = 0.000 Minimum = 1.000 Maximum = 1.000

Skewness = 0.000 Std. Error of Skew = 0.000
Kurtosis = 0.000 Std. Error Kurtosis = 0.000

VAR24 (N = 4) Sum = 5.000
Mean = 1.250 Variance = 0.250 Std.Dev. = 0.500
Std.Error of Mean = 0.250
Range = 1.000 Minimum = 1.000 Maximum = 2.000
Skewness = 2.000 Std. Error of Skew = 1.014
Kurtosis = 4.000 Std. Error Kurtosis = 2.619

VAR25 (N = 2) Sum = 2.000
Mean = 1.000 Variance = 0.000 Std.Dev. = 0.000
Std.Error of Mean = 0.000
Range = 0.000 Minimum = 1.000 Maximum = 1.000
Skewness = 0.000 Std. Error of Skew = 0.000
Kurtosis = 0.000 Std. Error Kurtosis = 0.000

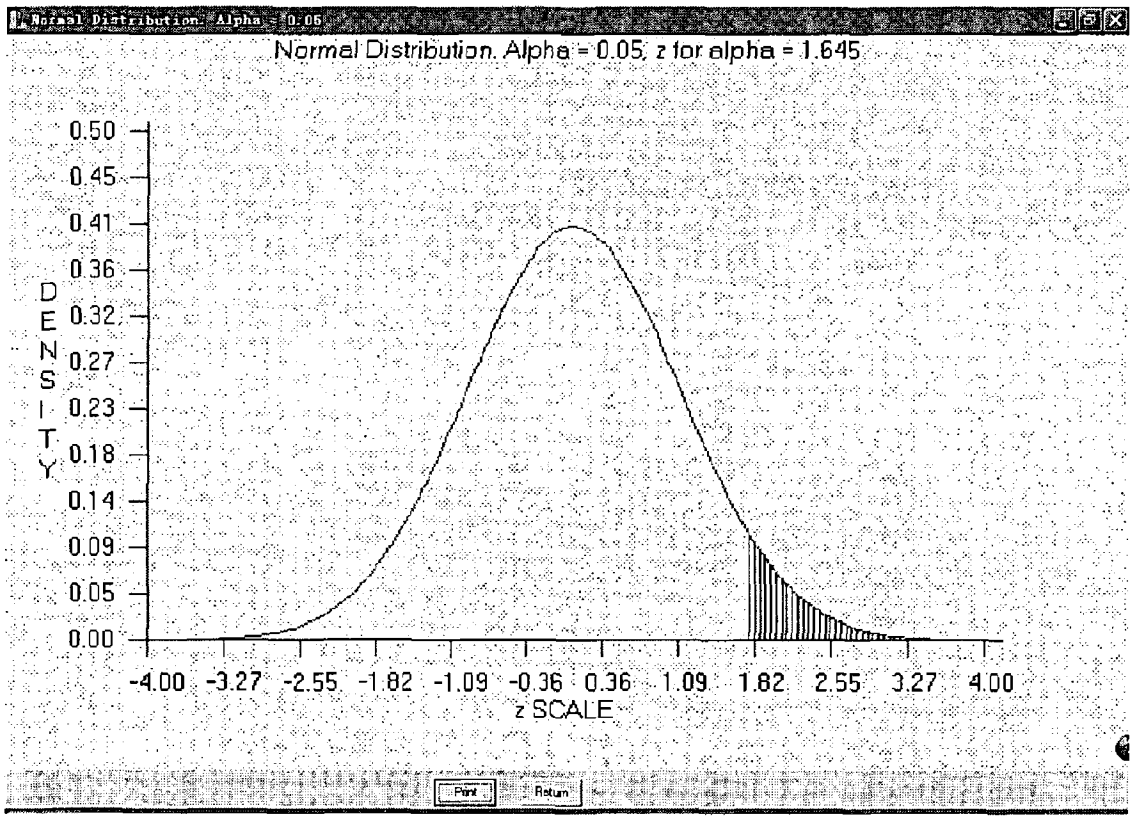
VAR26 (N = 2) Sum = 2.000
Mean = 1.000 Variance = 0.000 Std.Dev. = 0.000
Std.Error of Mean = 0.000
Range = 0.000 Minimum = 1.000 Maximum = 1.000
Skewness = 0.000 Std. Error of Skew = 0.000
Kurtosis = 0.000 Std. Error Kurtosis = 0.000

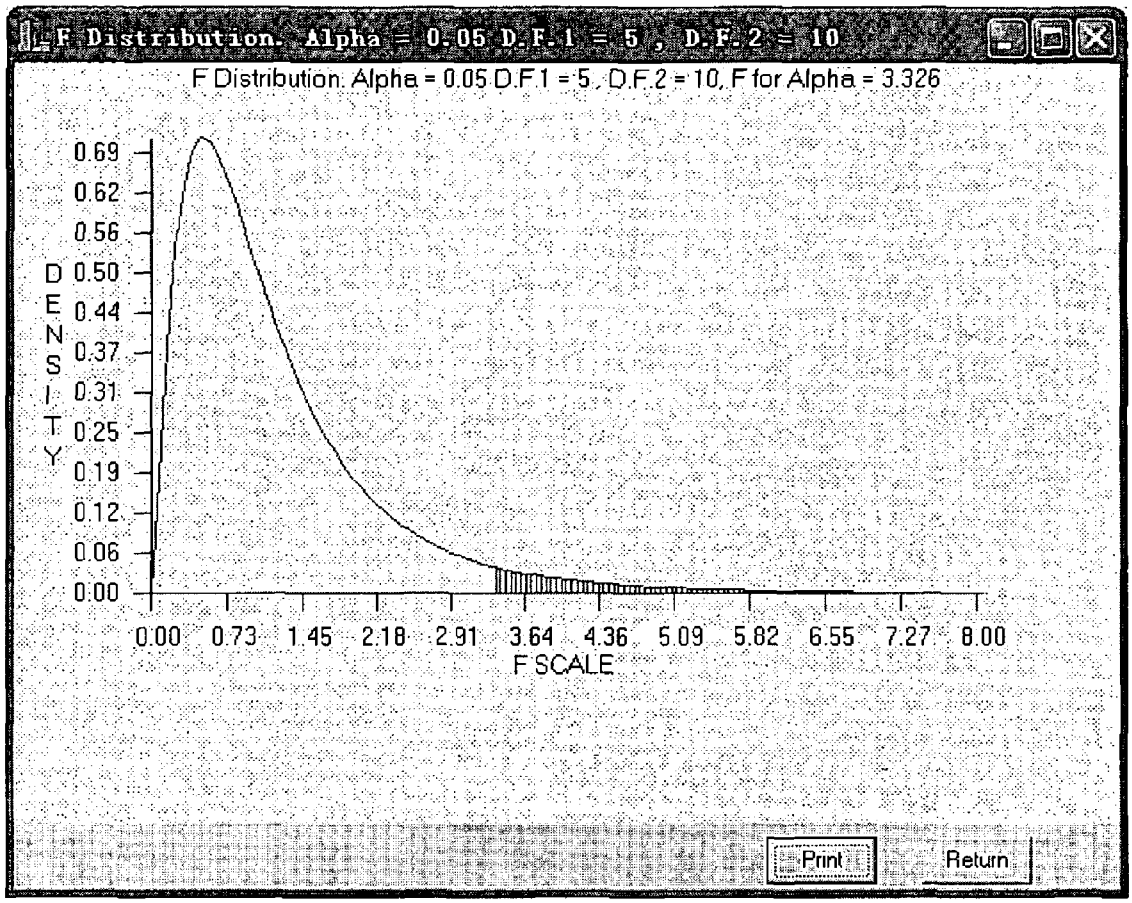
VAR27 (N = 2) Sum = 2.000
Mean = 1.000 Variance = 0.000 Std.Dev. = 0.000
Std.Error of Mean = 0.000
Range = 0.000 Minimum = 1.000 Maximum = 1.000
Skewness = 0.000 Std. Error of Skew = 0.000
Kurtosis = 0.000 Std. Error Kurtosis = 0.000

VAR28 (N = 7) Sum = 8.000
Mean = 1.143 Variance = 0.143 Std.Dev. = 0.378
Std.Error of Mean = 0.143
Range = 1.000 Minimum = 1.000 Maximum = 2.000
Skewness = 2.646 Std. Error of Skew = 0.794
Kurtosis = 7.000 Std. Error Kurtosis = 1.587

VAR29 (N = 8) Sum = 9.000
Mean = 1.125 Variance = 0.125 Std.Dev. = 0.354

```
Std.Error of Mean =      0.125
Range =      1.000  Minimum =      1.000  Maximum =      2.000
Skewness =      2.828  Std. Error of Skew =      0.752
Kurtosis =      8.000  Std. Error Kurtosis =      1.481

VAR30 (N = 3)  Sum =          4.000
Mean =      1.333  Variance =      0.333  Std.Dev. =      0.577
Std.Error of Mean =      0.333
Range =      1.000  Minimum =      1.000  Maximum =      2.000
Skewness =      0.000  Std. Error of Skew =      0.000
Kurtosis =      0.000  Std. Error Kurtosis =      0.000
```

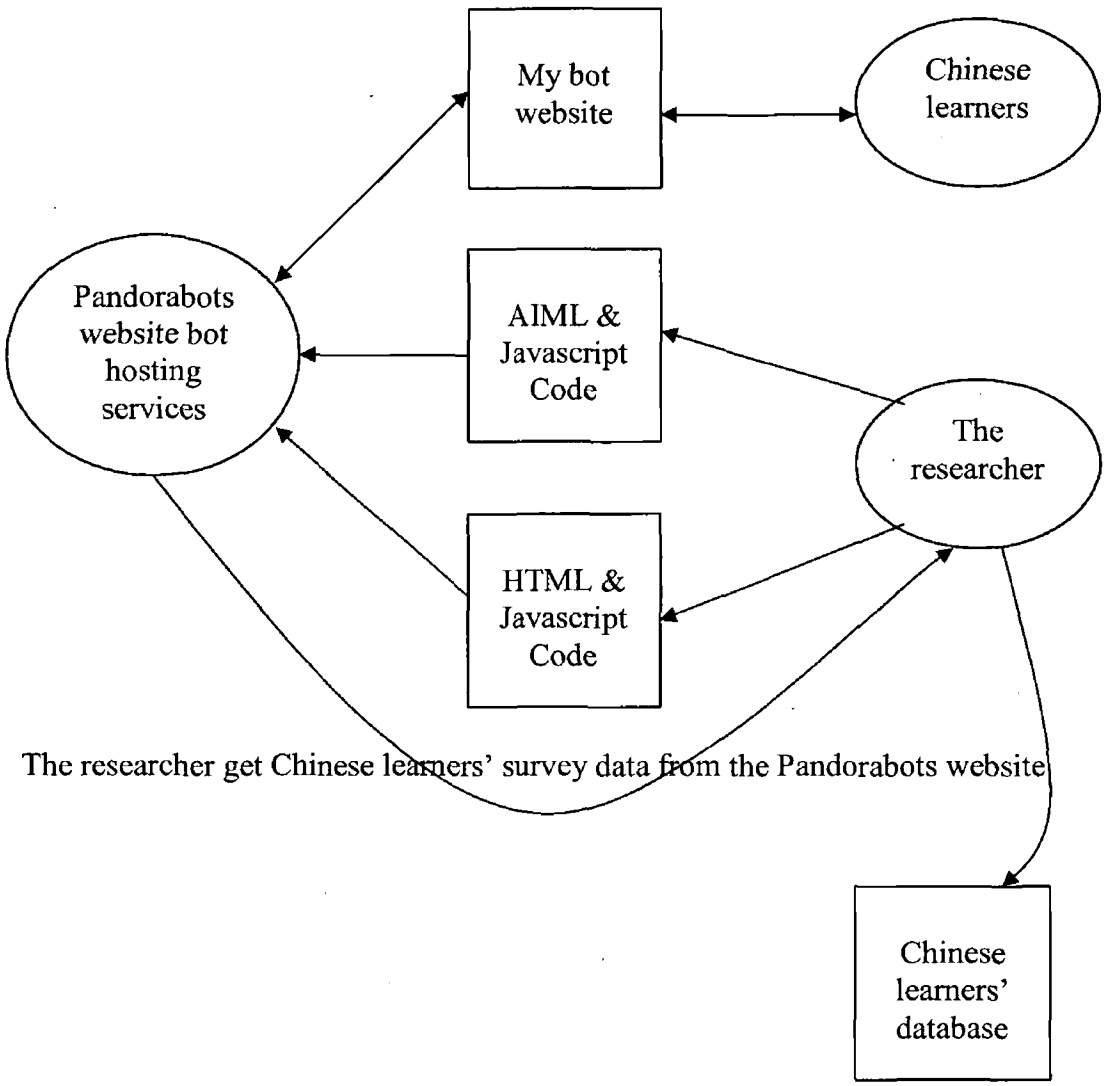




The sum of all the data is 254. The mean of all the raw data is 1.68. The standard deviation of the sample is 0.749. The standard error of the sample is 0.749 / square root of 151 that is .061. The skewness is 0.6 that is positively skewed with less large numbers of 3 (27) than the small numbers of 1 (75), so the mean could potentially be smaller if a more normal and larger sample or population is used. But the skewness still doesn't not exceed the 1 benchmark, therefore is not very significant. The Kurtosis is –1 that is not a big problem.

3. Implementation Review

3.1 The General Structure of My Project Website and Program



Pandorabots is the place where the researcher can create and unleash virtual personalities. Pandorabots is an experimental software robot hosting service based on the work of Dr. Richard Wallace and the A.L.I.C.E./AIML free software community. From any browser, the researcher may create, design and publish software robots – and make them available to anyone via the Internet.

The researcher produced 3 AIML files (aiml1.aiml, aiml2.aiml & aiml3.aiml) with javacript code to be uploaded to the pandorabots website to be used together with the

original default AIML files, because the researcher wants the users to talk with the researcher's robot not only about Chinese learning, but also any other topics that the original AIML files can handle.

The researcher used more javascript code than aiml code, because the aiml language lacks the capability of the javascript language to handle complex logical operation and pattern matching. The javascript is much more efficient, full functional than the aiml language at many instances. But the communication and connection among the aiml code, the javascript code and the Microsoft msagent character Merlin are not very easy, since not many examples or experiments over there due to their relatively unexplored status, however finally the researcher solved all the technical problems.

The researcher also produced a HTML file with javascript code and the object of Microsoft msagent (to produce the animation character of Merlin) to be uploaded to the pandorabots website to be used as my Chinese language learning survey and assessment's web page interface.

Users may tick the relevant checkboxes of my survey and assessment, then talk to my robot for their wanted information and answers. All the information of their conversation record and the survey data will be stored in the pandorabots website. The researcher could transfer all the assessment and survey data into a database such as Microsoft Access or Excel. Finally all the data will be analyzed and the whole project can be improved.

3.2 The details of the AIML file with Javascript code

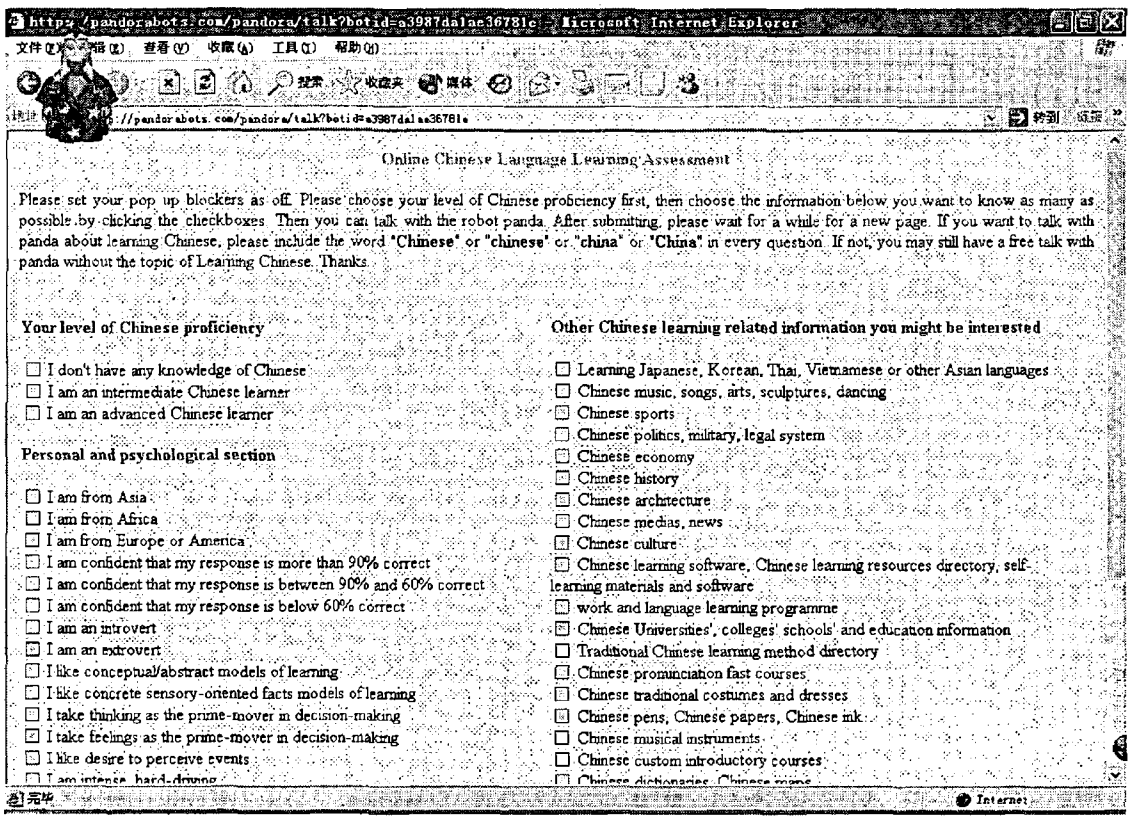
The researcher produced 3 AIML files in order to let the robot recognise the key words of the conversation of "Chinese", "chinese", "China" and "china" as well as the 3 possible sentence patterns of "xxxx Chinese", "Chinese xxxx" and "xxxx Chinese xxxx", so 3 possible sentence patterns multiple 4 possible key words, the result is 12 different combinations. Therefore the researcher has to produce 12 conversation categories and patterns in the AIML file.

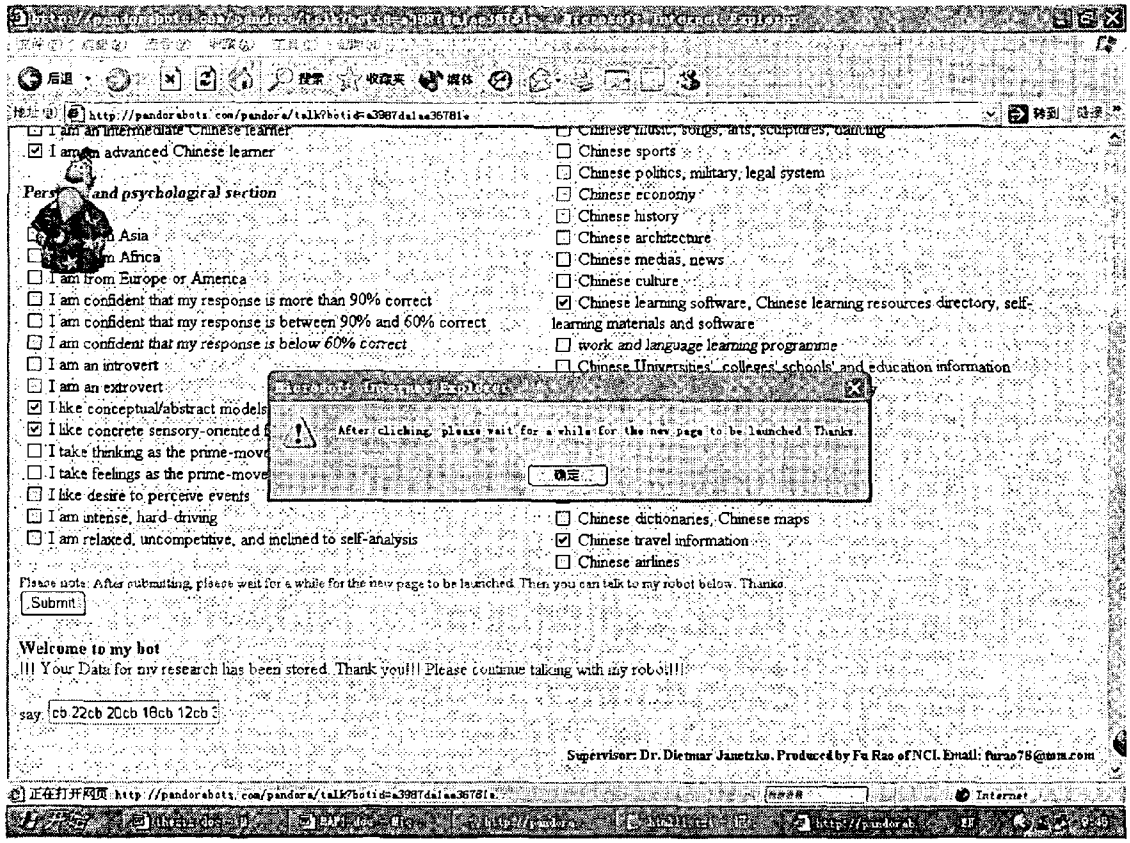
To make the code efficient, the researcher used the tag of <srai> in the file to just refer different questions into a same answer if applicable, but the pandorabots AIML interpreter only allows 3 recursions (use <srai> 3 times) in a single AIML file, the researcher has to split the file into 3 separate AIML files. The main file of aiml1.amil is provided below. To make things clear, the style of the words of explanation is bold and the most important parts of the code is in boxes. Each explanation is supplied with the resulting screenshot:

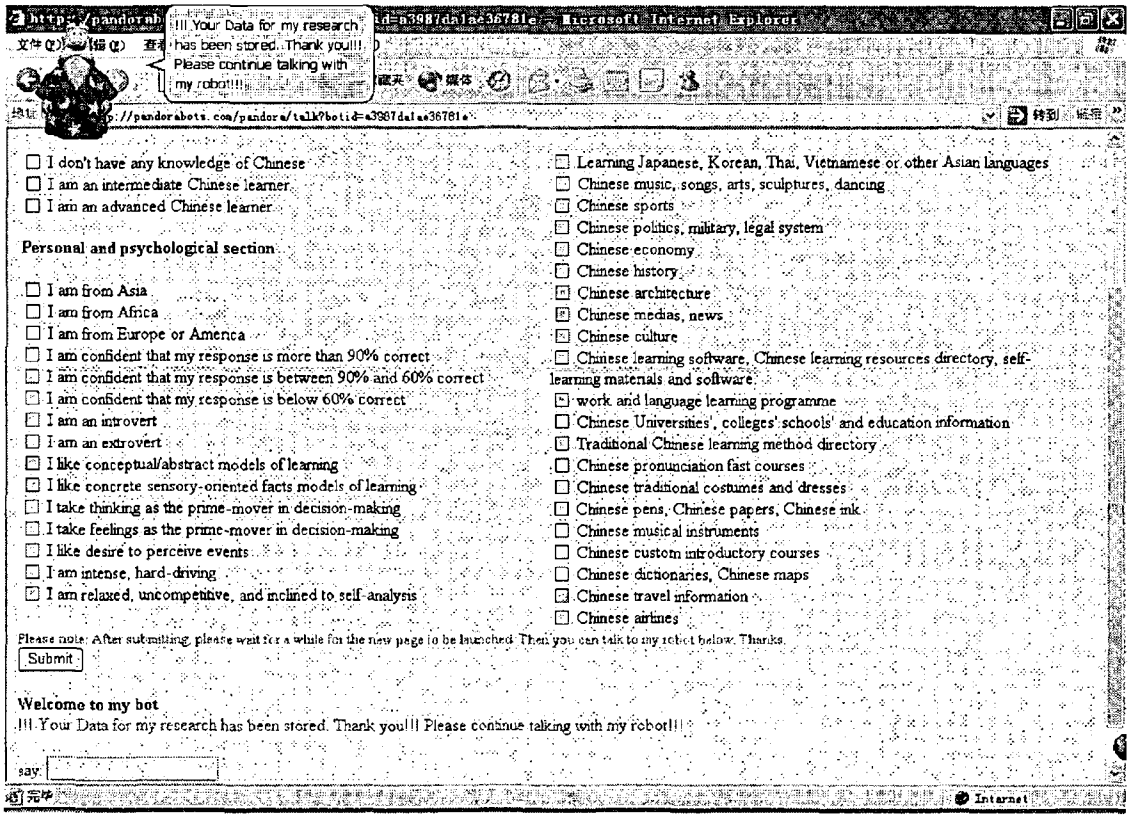
```
< ?xml version="1.0" encoding="UTF-8"? >

< aiml version="1.0" >

< category >

        < pattern > cb  * </pattern>

        <template>!!! Your Data for my research has been stored. Thank
you!!! Please continue talking with my robot!!!

</template>

    </category>
```

The researcher used the pattern of "cb *", because we nearly never use this pattern for normal conversation, when this pattern coming in from the html interface webpage, the robot knows they are not normal conversations but learners' assessment and survey data. Therefore the robot can response properly

by saying: "Your Data for my research has been stored. Thank you!!! Please continue talking with my robot".




I am an advanced Chinese learner
Personal and psychological section
I am from Asia
I am from Africa
I am from Europe or America
I am confident that my response is more than 90% correct
I am confident that my response is between 90% and 60% correct
I am confident that my response is below 60% correct
I am an introvert
I am an extrovert
I like conceptual/abstract models
I like concrete sensory-oriented
I take thinking as the prime-move
I take feelings as the prime-move
I like desire to perceive events
I am intense, hard-driving
I am relaxed, uncompetitive, and inclined to self-analysis
Chinese sports
Chinese politics, military, legal system
Chinese economy
Chinese history
Chinese architecture
Chinese medias, news
Chinese culture
Chinese learning software, Chinese learning resources directory, self-learning materials and software
work and language learning programme
Chinese Universities', colleges' schools' and education information
Microsoft Internet Explorer
After clicking, please wait for a while for the new page to be launched. Thanks.
确定
Chinese dictionaries, Chinese maps
Chinese travel information
Chinese airlines
Please note: After submitting, please wait for a while for the new page to be launched. Then you can talk to my robot below. Thanks
Submit
Welcome to my bot
!!! Your Data for my research has been stored. Thank you!!! Please continue talking with my robot!!!
say:
Supervisor: Dr. Dietmar Janetzko. Produced by Fu Rao of NCI. Email: furao78@msn.com


!!! Your Data for my research has been stored. Thank you!!! Please continue talking with my robot!!!
I don't have any knowledge of Chinese
I am an intermediate Chinese learner
I am an advanced Chinese learner
Personal and psychological section
I am from Asia
I am from Africa
I am from Europe or America
I am confident that my response is more than 90% correct
I am confident that my response is between 90% and 60% correct
I am confident that my response is below 60% correct
I am an introvert
I am an extrovert
I like conceptual/abstract models of learning
I like concrete sensory-oriented facts models of learning
I take thinking as the prime-mover in decision-making
I take feelings as the prime-mover in decision-making
I like desire to perceive events
I am intense, hard-driving
I am relaxed, uncompetitive, and inclined to self-analysis
Learning Japanese, Korean, Thai, Vietnamese or other Asian languages
Chinese music, songs, arts, sculptures, dancing
Chinese sports
Chinese politics, military, legal system
Chinese economy
Chinese history
Chinese architecture
Chinese medias, news
Chinese culture
Chinese learning software, Chinese learning resources directory, self-learning materials and software
work and language learning programme
Chinese Universities', colleges' schools' and education information
Traditional Chinese learning method directory
Chinese pronunciation fast courses
Chinese traditional costumes and dresses
Chinese pens, Chinese papers, Chinese ink
Chinese musical instruments
Chinese custom introductory courses
Chinese dictionaries, Chinese maps
Chinese travel information
Chinese airlines
Please note: After submitting, please wait for a while for the new page to be launched. Then you can talk to my robot below. Thanks.
Submit
Welcome to my bot
!!! Your Data for my research has been stored. Thank you!!! Please continue talking with my robot!!!
say:

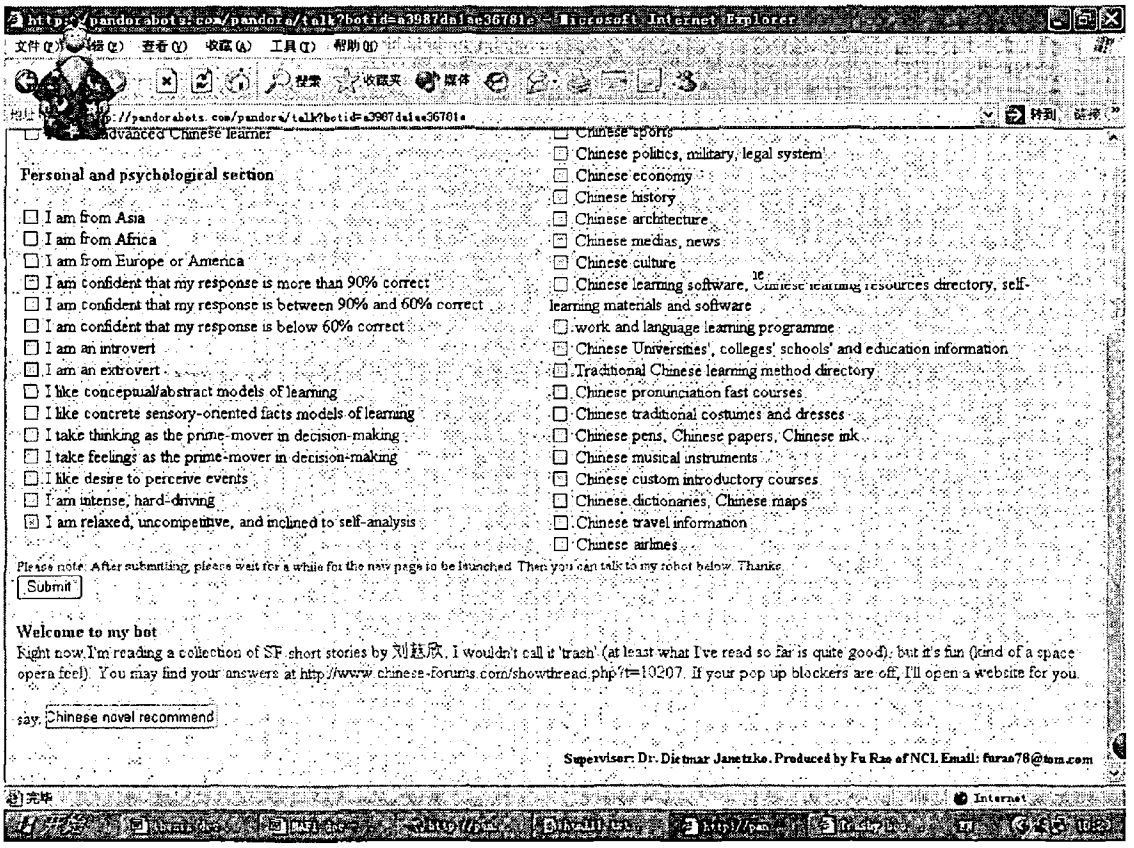
```
<category>

<pattern> Chinese _ </pattern>

<template> <script language="JavaScript"> var y= " <input index="1"/> "

var x = y.toLowerCase()

if (!(!x.match("recommend") || !x.match("novel"))|| !(!x.match("give") ||

!x.match("novel")) || !(!x.match("what") || !x.match("novel")))

{

document.write("Right now I'm reading a collection of SF short stories by □□□, I wouldn't call it 'trash' (at least what I've read so far is quite good), but it's fun (kind of a space opera feel). You may find your answers at http://www.chinese-forums.com/showthread.php?t=10207. If your pop up blockers are off, I'll open a website for you")

var winObj1

=window.open('http://www.chinese-forums.com/showthread.php?t=10207')

}
```

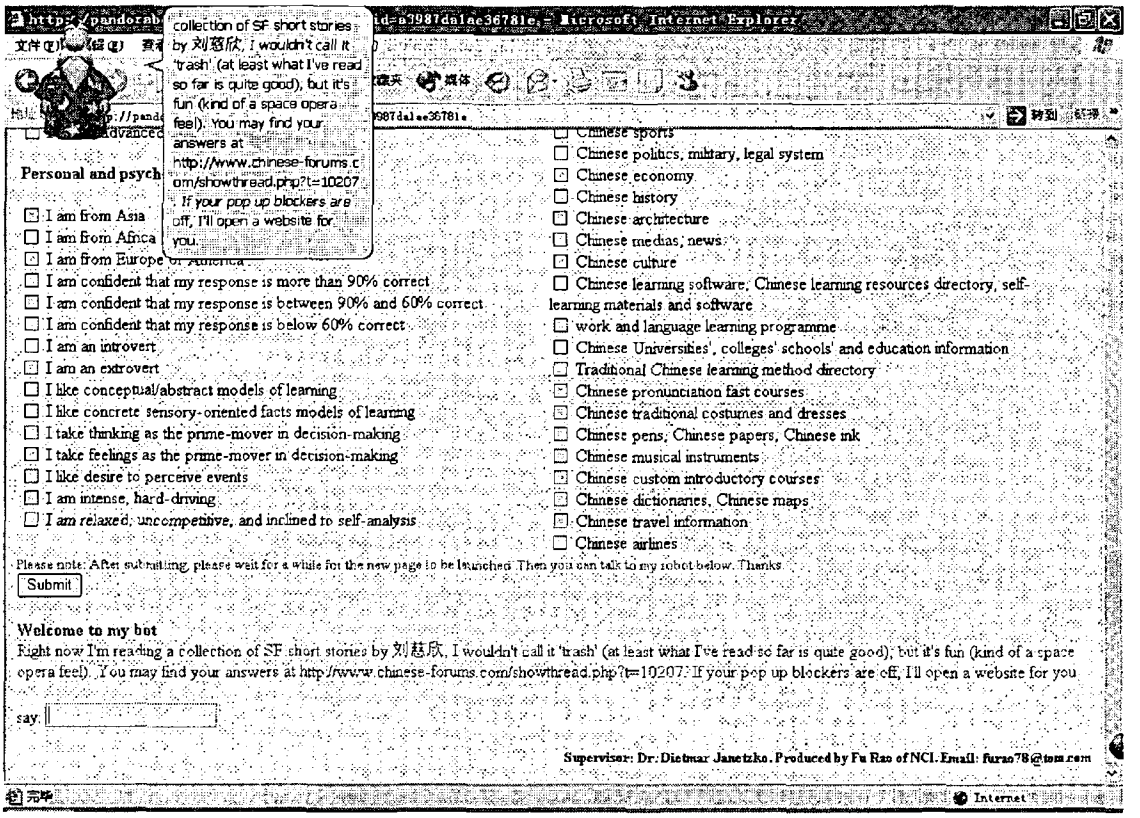
The pattern of "Chinese _" is to catch the pattern of "Chinese xxxx" in a conversation in the AIML language. var y= "<input index="1"/>" is very important to communicate between AIML and Javascript. <input index="1"/> is the AIML user current input content tag. The value of user input will be transferred from AIML to Javascript variable y. To be more efficient, the value of y is forced to be lowercase and transferred to variable x, so now the researcher saved a lot of coding. No matter users used capital letters or not, the lowercased input needs only lowercased pattern only, therefore no coding for capital letters anymore.

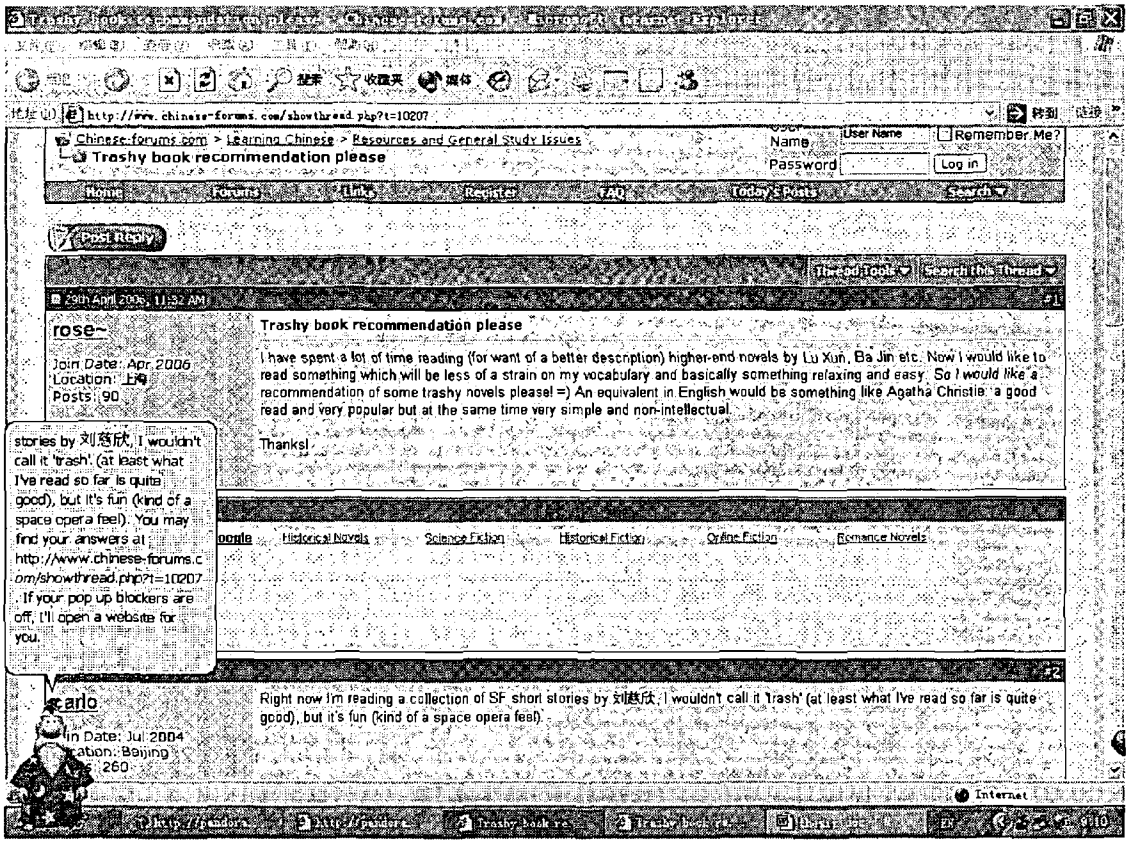
Because the AIML interpreter can't parse correctly the Javacript logical operator of "&&"(and), I have to use the method of negative's negative to produce the same effects. The (!(!x.match("recommend") || !x.match("novel"))

gives the same effects of x.match("recommend") && x.match("novel"). The input sentence pattern matching should be the most specific and detailed the first and more general and simple the next, since if the more general and simple pattern's code used before the more specific and detailed code, then the later code will never be reached and all be wasted.

window.open('http://www.chinese-forums.com/showthread.php?t=10207') code opens relevant websites for users, so they may find their answers and more information there. Due to this project's time limitation, most answers to user questions will direct user to the most relevant web pages and users may find their answers and information there. If time allows in the future, the researcher may give more exact answers to the users as well as providing all relevant web pages, also *more pattern matching, more precise and detailed pattern matching* and more answers could be supplied if time warrants.




collection of SF short stories by 刘慈欣, I wouldn't call it 'trash' (at least what I've read so far is quite good), but it's fun (kind of a space opera feel). You may find your answers at http://www.chinese-forums.com/showthread.php?t=10207. If your pop up blockers are off, I'll open a website for you.
Personal and psych
I am from Asia
I am from Africa
I am from Europe or America
I am confident that my response is more than 90% correct
I am confident that my response is between 90% and 60% correct
I am confident that my response is below 60% correct
I am an introvert
I am an extrovert
I like conceptual/abstract models of learning
I like concrete sensory-oriented facts models of learning
I take thinking as the prime-mover in decision-making
I take feelings as the prime-mover in decision-making
I like desire to perceive events
I am intense, hard-driving
I am relaxed, uncompetitive, and inclined to self-analysis
Chinese sports
Chinese politics, military, legal system
Chinese economy
Chinese history
Chinese architecture
Chinese medias, news
Chinese culture
Chinese learning software, Chinese learning resources directory, self-learning materials and software
work and language learning programme
Chinese Universities', colleges' schools' and education information
Traditional Chinese learning method directory
Chinese pronunciation fast courses
Chinese traditional costumes and dresses
Chinese pens, Chinese papers, Chinese ink
Chinese musical instruments
Chinese custom introductory courses
Chinese dictionaries, Chinese maps
Chinese travel information
Chinese airlines
Please note: After submitting, please wait for a while for the new page to be launched. Then you can talk to my robot below. Thanks
Submit
Welcome to my bot
Right now I'm reading a collection of SF short stories by 刘慈欣, I wouldn't call it 'trash' (at least what I've read so far is quite good), but it's fun (kind of a space opera feel). You may find your answers at http://www.chinese-forums.com/showthread.php?t=10207. If your pop up blockers are off, I'll open a website for you
say:
Supervisor: Dr. Dietmar Janetzko. Produced by Fu Rao of NCI. Email: furao78@tom.com



else if (!(!x.match("how much") || !x.match("study")) || !(!x.match("how much") || !x.match("learn")))

{

document.write("I work full-time, so I study during lunch break, and listen to recordings on the 4km walk to the office, and on the way home. When I get home, I normally study for an hour, if I don't get home too late. I wish I had more time in a day! You may find your answers at http://www.chinese-forums.com/showthread.php?t=9552. If your pop up blockers are off, I'll open a website for you")

var winObj1

=window.open('http://www.chinese-forums.com/showthread.php?t=9552')

}

else if (!(!x.match("handwriting") || !x.match("input")))

{

document.write("□□□http://www.hw99.com/ the most famous product in China. You may find your answers at http://www.chinese-forums.com/showthread.php?t=10206. If your pop up blockers are off, I'll open a website for you")

var winObj1

=window.open('http://www.chinese-forums.com/showthread.php?t=10206')

}

else if (!(!x.match("typ") || !x.match("program")) || !(!x.match("window") || !x.match("instal")))

{

document.write("Have you tried NJStar Communicator. If your pop up blockers are off, I'll open a website for you")

var winObj1

=window.open('http://www.chinese-forums.com/showthread.php?t=3400')

}

else if (!(!x.match("song") || !x.match("woman")))

{

document.write("Did you want English as well? this is the Faye Wong version: □ □□ □ □ □ □□ □ □ □ □ □ gē shǒu wáng fēi zhuān jí fēi gǎn qíng shēng huó □ □ gē cí □:miyuki nakajima qū □:□ □ □ cí hé qǐ hóng □:tony a biān □ □ □ □ □ □ □ rén jiàn zuì le yè gèng shēn □ □ □ □ □ □ □ □ zài zhè yī kè duō mo jiē jìn □ □ □ □ □ □ □ sī xiǎng fǎng sì zài yáo hàn □ □ □ □ □ máo dùn yě gèng shēn □ □ □ □ □ □ □

céng bèi pò suì guò de xīn. You may find your answers at http://www.chinese-forums.com/showthread.php?t=10220. If your pop up blockers are off, I'll open a website for you")

var winObj1

=window.open('http://www.chinese-forums.com/showthread.php?t=10220')

}

else if (!(!x.match("favourite") || !x.match("song")) || !(!x.match("favorite") || !x.match("song")))

{

document.write("Mine is □□□□□□□ by □□. You may find your answers at http://www.chinese-forums.com/showthread.php?t=10219. If your pop up blockers are off, I'll open a website for you")

var winObj1

=window.open('http://www.chinese-forums.com/showthread.php?t=10219')

}

else if (!(!x.match("handwriting") || !x.match("recog")))

{

document.write("□□□http://www.hw99.com/ the most famous product in China. You may find your answers at http://www.chinese-forums.com/showthread.php?t=10218. If your pop up blockers are off, I'll open a website for you")

var winObj1

=window.open('http://www.chinese-forums.com/showthread.php?t=10218')

```
}

else if (!(!x.match("xp") || !x.match("install")))

{

document.write("It depends on where you're trying to display them. If you're trying to see them in IE or Forefox, you have to go to View - Character Encoding and find (Auto-detect Chinese). If you're trying to run Chinese programs, you have to go to Regional and Language Options - Advanced, then click on the drop-down menu and select the appropriate Chinese formatting option. You may find your answers at http://www.chinese-forums.com/showthread.php?t=10209. If your pop up blockers are off, I'll open a website for you")

var winObj1

=window.open('http://www.chinese-forums.com/showthread.php?t=10209')

}

else if (!(!x.match("time") || !x.match("to china")) || !(!x.match("when") || !x.match("to china")))

{

document.write("I've never been a huge proponent of immersion with no knowledge of the language. I think you should at least study a little before you're forced to use it in everyday life. But if you know that this technique works for you, it's not an issue. If your pop up blockers are off, I'll open a website for you")

var winObj1

=window.open('http://www.chinese-forums.com/showthread.php?t=10044')

}

else if (!(!x.match("job") || !x.match("ireland")) || !(!x.match("job") || !x.match("dublin")) || !(!x.match("employ") || !x.match("ireland")) ||
```

```
!(!x.match("employ") || !x.match("dublin")) || !(!x.match("how") || !x.match("job"))||
!(!x.match("how") || !x.match("employ"))|| !(!x.match("where") || !x.match("job"))||
!(!x.match("where") || !x.match("employ")))

{

document.write("You may find your answers at www.newjobs.com.cn,
http://www.talenting.com/talenting/welcome.jsp, www.4icj.com/cn/?gclid=CN-
206exnoQCFTkvEQodTiR4jA, local Chinese Embassy, Consulate or job seeking
authority such as FAS in Ireland. If your pop up blockers are off, I'll open a website
for you")

var winObj1

=window.open('http://www.4icj.com/cn/?gclid=CN-206exnoQCFTkvEQodTiR4jA')

}

else if (x.match("job") || x.match("employ"))

{

document.write("Many Chinese learners enhanced their earning potential, but even
more widened their perspectives and knowledge. It depends on your situation and
language proficiency, but it does help. You may find your answers at
www.newjobs.com.cn, http://www.talenting.com/talenting/welcome.jsp,
www.4icj.com/cn/?gclid=CN-206exnoQCFTkvEQodTiR4jA, local Chinese Embassy,
Consulate or job seeking authority such as FAS in Ireland. If your pop up blockers are
off, I'll open a website for you")

var winObj1

=window.open('http://www.4icj.com/cn/?gclid=CN-206exnoQCFTkvEQodTiR4jA')

}

else if (x.match("dublin") || x.match("ireland"))
```

```
{

document.write("You may find your answers at the websites www.tcd.ie/CLCS/courses/extramural.html, www.all.ie/dublin.php and www.nightcourses.com/profiles/adult_ed/asian.html. If your pop up blockers are off, I'll open 2 websites for you")

var winObj1

=window.open('http://www.tcd.ie/CLCS/courses/extramural.html')

var winObj2

=window.open('http://www.all.ie/dublin.php')

}

else if (x.match("foreign polic"))

{

document.write("I don't know any online resources, but there are tons of books written about the subject, so maybe you can check the nearest (academic) library that has a decent amount of books about China. If your pop up blockers are off, I'll open a website for you")

var winObj1

=window.open('http://www.chinese-forums.com/showthread.php?t=9986')

}

else if (x.match("firewall") || x.match("windows"))

{

document.write("First thing: English versions of these software can be installed on Chinese Windows. They work perfectly fine. If you just want to type Chinese you
```

only have to install the East Asian Language support for your windows (you have your windows CDs with you don't you?) ... and if some texts still appear to be complete rubbish you need to set your encoding for non-unicode texts to Simplified Chinese (Mainland China) or Traditional Chinese (Hong Kong, Taiwan ...). Both of these can be done in the Language and International Support in Control Panel. Your copy of Windows will then behave as if it were a Chinese version in almost all occasions, though the user interface is still in English (which might be a plus for you.) The most popular firewall product in China is probably the Norton Suite (called something like '□□□□□□' in the mainland) and you can buy it (Chinese version of course) in almost any shops selling non-pirated copies of software. You may find your answers at http://www.chinese-forums.com/showthread.php?t=10163. If your pop up blockers are off, I'll open a website for you")

var winObj1

=window.open('http://www.chinese-forums.com/showthread.php?t=10163')

}

else if (x.match("uk") || x.match("england") || x.match("brit"))

{

document.write("In general, university name is a good thing in Asia. If you go to a world famous school, it will open the doors for entry into big name companeis as well. Skill and talent matter of coruse, but Cambridge, Oxford, Harvard, Yale...they are all names that draw attention, especially to Intl. companies. If your pop up blockers are off, I'll open a website for you")

var winObj1

=window.open('http://www.chinese-forums.com/showthread.php?t=9888')

}

```
else if (x.match("photo") || x.match("pictur") || x.match("camera") || x.match("map") ||
x.match("scene") || x.match("webshot") || x.match("portrai") || x.match("face") ||
x.match("pictu"))

{

document.write("You may find your answers at website: http://www.chinese-
forums.com/archive/index.php/f-29.html. If your pop up blockers are off, I'll open a
website for you")

var winObj1

=window.open('http://www.chinese-forums.com/archive/index.php/f-29.html')

}

else if (x.match("sport") || x.match("sports") || x.match("world cup") ||
x.match("match") || x.match("rowin") || x.match("soccer") || x.match("tennis") ||
x.match("playe") || x.match("olympi") || x.match("kung fu") || x.match("kung-fu") ||
x.match("ball") || x.match("cup") || x.match("rugby") || x.match("martial arts") ||
x.match("nba") || x.match("medal") || x.match("aqua") || x.match("tour ") ||
x.match("marathon") || x.match("cycl") || x.match("footbal") || x.match("nike") ||
x.match("cricke") || x.match("team") || x.match("runn") || x.match("race") ||
x.match("traini") || x.match("bik") || x.match("swim") || x.match("basebal") ||
x.match("leagu") || x.match("kungfu") || x.match("triathlon") || x.match("basketbal") ||
x.match("volleybal") || x.match("skateboard") || x.match("hik") || x.match("karat") ||
x.match("snowboard") || x.match("gymnas") || x.match("ski") || x.match("formula 1"))

{

document.write("You may find your answers at website: http://www.chinese-
forums.com/archive/index.php/f-28.html. If your pop up blockers are off, I'll open a
website for you")

var winObj1

=window.open('http://www.chinese-forums.com/archive/index.php/f-28.html')
```

```
}

else if (x.match("busin") || x.match("econom") || x.match("compan") ||
x.match("internsh") || x.match("aviat") || x.match("ibm") || x.match("laser scanne") ||
x.match("hsbc") || x.match("computer game") || x.match("invest") || x.match("ipo") ||
x.match("real esta") || x.match("shares") || x.match("stock") || x.match("stake") ||
x.match("brand") || x.match("deal") || x.match("privatiz") || x.match("pensio") ||
x.match("bank") || x.match("refor") || x.match("touri") || x.match("recruit") ||
x.match("wto") || x.match("contract") || x.match("currenc") || x.match("offic") ||
x.match("producti") || x.match("driver's lisenc") || x.match("lotto") ||
x.match("market") || x.match("compet") || x.match("made in") || x.match("fortune") ||
x.match("price inde") || x.match("trade") || x.match("disne") || x.match("enterpris") ||
x.match("retail") || x.match("store") || x.match("shoppin") || x.match("industr") ||
x.match("manufact") || x.match("facto") || x.match("web host") || x.match("financ") ||
x.match("card") || x.match("profit") || x.match("tax") || x.match("growth"))

{

document.write("You may find your answers at website: http://www.chinese-
forums.com/archive/index.php/f-30.html. If your pop up blockers are off, I'll open a
website for you")

var winObj1

=window.open('http://www.chinese-forums.com/archive/index.php/f-30.html')

}

else if (x.match("histo") || x.match("inva") || x.match("invent") || x.match("great wall")
|| x.match("forbidden city") || x.match("civili") || x.match("armo") || x.match("tibet") ||
x.match("ancient") || x.match("antiq") || x.match("dynast") || x.match("populat") ||
x.match("scenic") || x.match("tributary") || x.match("opiu") || x.match("innova") ||
x.match("korean War") || x.match("mongo") || x.match("ethn") || x.match("ruler") ||
x.match("marco polo") || x.match("sino-japan") || x.match("traitor") ||
x.match("libera") || x.match("eunuch") || x.match("ancest") || x.match("tomb") ||
```

```
x.match("enlighten") || x.match("Found") || x.match("warrio") || x.match("footbind") ||
x.match("world war"))

{

document.write("You may find your answers at website: http://www.chinese-forums.com/archive/index.php/f-21.html. If your pop up blockers are off, I'll open a website for you")

var winObj1

=window.open('http://www.chinese-forums.com/archive/index.php/f-21.html')

}

else if (x.match("film") || x.match("tv") || x.match("television") || x.match("cctv") ||
x.match("movie") || x.match("traged") || x.match("Documentary") || x.match("Star") ||
x.match("vcd") || x.match("drama") || x.match("epic") || x.match("choreograp") ||
x.match("Animatio") || x.match("dvd") || x.match("show") || x.match("subtitle") ||
x.match("festiva"))

{

document.write("You may find your answers at website: http://www.chinese-forums.com/archive/index.php/f-19.html. If your pop up blockers are off, I'll open a website for you")

var winObj1

=window.open('http://www.chinese-forums.com/archive/index.php/f-19.html')

}

else if (x.match("cultur") || x.match("condition") || x.match("societ") ||
x.match("socia") || x.match("conditio") || x.match("custo") || x.match("tradition ") ||
x.match("courte") || x.match("misunderstand") || x.match("impressi") ||
x.match("superstiti") || x.match("tale") || x.match("agreem") || x.match("flag") ||
```

x.match("feng shui") || x.match("animal") || x.match("measuremen") || x.match("peasan") || x.match("farme") || x.match("chinese name") || x.match("politic") || x.match("medic") || x.match("chess") || x.match("dog") || x.match("mahjong") || x.match("toast") || x.match("tattoo") || x.match("bicycl") || x.match("funera") || x.match("exhibit") || x.match("impress") || x.match("constellat") || x.match("premari") || x.match("gender") || x.match("demograph") || x.match("dragon") || x.match("survey") || x.match("dating") || x.match("air qualit") || x.match("revolut") || x.match("barber") || x.match("anti-japan") || x.match("buddh") || x.match("philos"))

{

document.write("You may find your answers at website: http://www.chinese-forums.com/archive/index.php/f-15.html. If your pop up blockers are off, I'll open a website for you")

var winObj1

=window.open('http://www.chinese-forums.com/archive/index.php/f-15.html')

}

else if (x.match("spring roll") || x.match("food") || x.match("vegeta") || x.match("dish") || x.match("dinner") || x.match("breakfas") || x.match("milk") || x.match("tea ") || x.match("cuisin") || x.match("tast") || x.match("eat") || x.match("restaurant") || x.match("flavor") || x.match("flavour") || x.match("rice") || x.match("chopstic") || x.match("meal") || x.match("meat") || x.match("cream") || x.match("fish") || x.match("delic") || x.match("cafe") || x.match("recipe") || x.match("cook") || x.match("spic") || x.match("kitche") || x.match("coffee") || x.match("cake") || x.match("banquet") || x.match("dumpli") || x.match("soup") || x.match("egg") || x.match("nut") || x.match("buffet") || x.match("beer"))

{

document.write("You may find your answers at website: http://www.chinese-forums.com/archive/index.php/f-14.html. If your pop up blockers are off, I'll open a website for you")

```
var winObj1

=window.open('http://www.chinese-forums.com/archive/index.php/f-14.html')

}

else if (x.match("musi") || x.match("albu") || x.match("danc") || x.match("lyri") ||
x.match("song") || x.match("band") || x.match("instrum") || x.match("punk") ||
x.match("opera") || x.match("melod") || x.match("mtv") || x.match("rap") ||
x.match("midi") || x.match("cd") || x.match("hip-hop") || x.match("debut") ||
x.match("rock") || x.match("artis") || x.match("pop song") || x.match("singe"))

{

document.write("You may find your answers at website: http://www.chinese-
forums.com/archive/index.php/f-13.html. If your pop up blockers are off, I'll open a
website for you")

var winObj1

=window.open('http://www.chinese-forums.com/archive/index.php/f-13.html')

}

else if (x.match("art") || x.match("liter") || x.match("magaz") || x.match("poe") ||
x.match("writer") || x.match("calligr") || x.match("paint") || x.match("story") ||
x.match("saying") || x.match("novel") || x.match("archite") || x.match("confu") ||
x.match("propagan") || x.match("spirit") || x.match("fictio") || x.match("schol") ||
x.match("comic") || x.match("comedia"))

{

document.write("You may find your answers at website: http://www.chinese-
forums.com/archive/index.php/f-12.html. If your pop up blockers are off, I'll open a
website for you")

var winObj1
```

```
=window.open('http://www.chinese-forums.com/archive/index.php/f-12.html')

}

else if (x.match("classif") || x.match("adverti") || x.match("ads") ||
x.match("information") || x.match("info") || x.match("placement") || x.match("partne")
|| x.match("second-hand")|| x.match("exchang") || x.match("apartment") ||
x.match("room") || x.match("studio")|| x.match("rent") || x.match("volunt") ||
x.match("seek") || x.match("second hand")|| x.match("tutor") || x.match("mate") ||
x.match("home stay") || x.match("furni")|| x.match("to let") || x.match("apt") ||
x.match("consult") || x.match("2nd hand")|| x.match("accommoda") ||
x.match("propert") || x.match("wanted") || x.match("apart")|| x.match("tefl") ||
x.match("look for") || !(!x.match("teach")|| !x.match("germa")) || !(!x.match("teach")||
!x.match("frenc")) || !(!x.match("look")|| !x.match("for")))

{

document.write("You may find your answers at website: http://www.chinese-
forums.com/archive/index.php/f-37.html. If your pop up blockers are off, I'll open a
website for you")

var winObj1

=window.open('http://www.chinese-forums.com/archive/index.php/f-37.html')

}

else if (x.match("teach"))

{

document.write("You may find your answers at website: http://www.chinese-
forums.com/archive/index.php/f-36.html. If your pop up blockers are off, I'll open a
website for you")

var winObj1
```

```
=window.open('http://www.chinese-forums.com/archive/index.php/f-36.html')

}

else if (!(!x.match("liv")|| !x.match("china")) || x.match("atm") || x.match("trave") ||
x.match("touri") || x.match("move to") || x.match("internet") || x.match("phone") ||
x.match("ticket") || x.match("hotel") || x.match("airport") || x.match("channel") ||
x.match("bar") || x.match("pub") || x.match("prescrip") || x.match("cat") ||
x.match("pet") || x.match("sex") || x.match("make money") || x.match("visa") ||
x.match("flight") || x.match("destin") || x.match("pharma") || x.match("relocat") ||
x.match("dsl") || x.match("playe") || x.match("laundr") || x.match("club") ||
x.match("fashio") || x.match("agen") || x.match("flight") || x.match("trip") )

{

document.write("You may find your answers at website: http://www.chinese-
forums.com/archive/index.php/f-25.html. If your pop up blockers are off, I'll open a
website for you")

var winObj1

=window.open('http://www.chinese-forums.com/archive/index.php/f-25.html')

}


else if (x.match("fellowship") || x.match("grade") ||x.match("degree") ||
x.match("enrol") ||x.match("educat") || x.match("scholarship") ||x.match("locals") ||
x.match("instit") || x.match("universi") || x.match("schoo") || x.match("colleg") ||
x.match("acade") || x.match("applicati") || x.match("dorm") || x.match("calend") ||
x.match("global village") || x.match("international student") || x.match("campu") ||
x.match("class") || x.match("course") || x.match("tuition") || x.match("fee ") ||
x.match("hostel") || x.match("student") || x.match("intensive program") ||
x.match("semest") || x.match("housin")|| !(!x.match("cost") || !x.match("stud")) ||
```

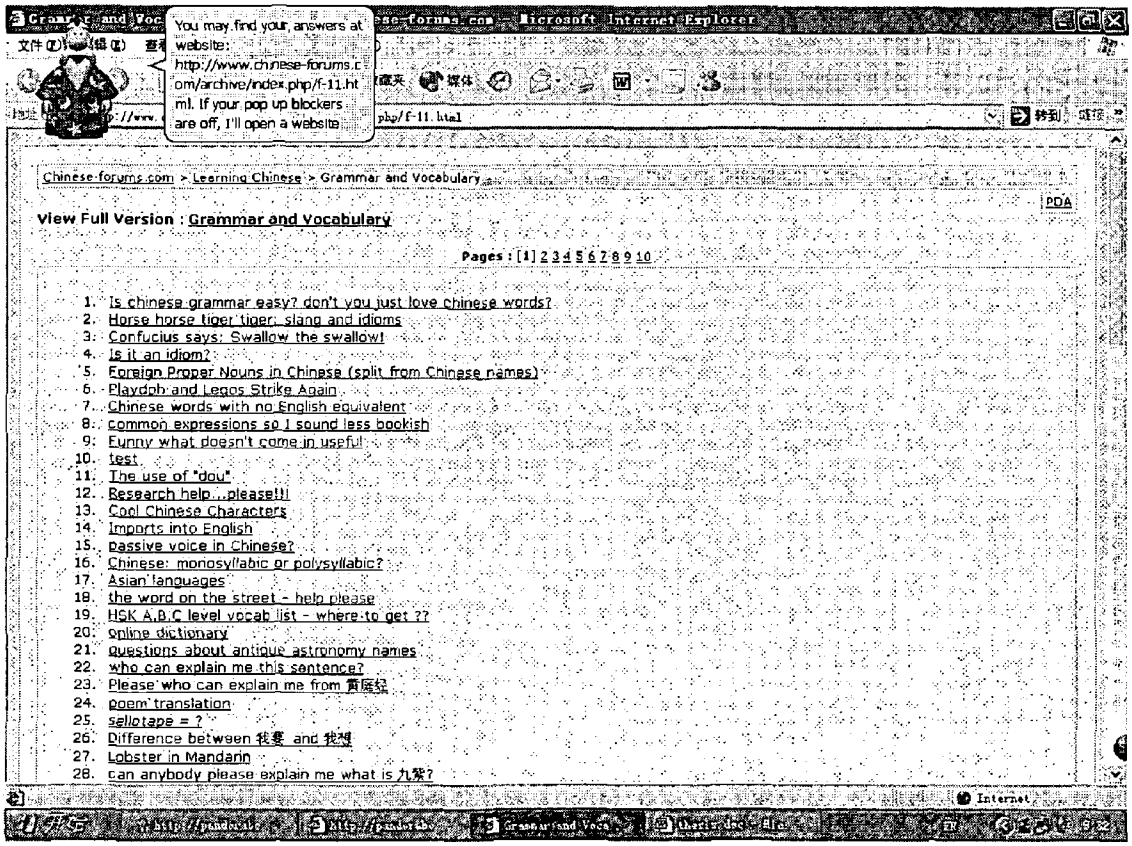
```
!(!x.match("stud") || !x.match("in beijin")) || !(!x.match("stud") || !x.match("in pekin")))

{

document.write("You may find your answers at websites: http://www.chinese-forums.com/archive/index.php/f-20.html, http://www.chinese-forums.com/archive/index.php/f-38.html. If your pop up blockers are off, I'll open 2 websites for you")

var winObj1

=window.open('http://www.chinese-forums.com/archive/index.php/f-20.html')

var winObj2

=window.open('http://www.chinese-forums.com/archive/index.php/f-38.html')

}


else if (x.match("resourc") || x.match("general") || x.match("issue") || x.match("comput") || x.match("tech") || x.match("window") || x.match("softwar") || x.match("web") || x.match("mail") || x.match("forum") || x.match("typ") || x.match("digit") || x.match("radio") || x.match("online") || x.match("brows") || x.match("chat") || x.match("broadband") || x.match("chinese reader") || x.match("security") || x.match("mandari") || x.match("os") || x.match("operating system") || x.match("search engine") || x.match("code") || x.match("pdf") || x.match("word proces") || x.match("njstar") || x.match("apple") || x.match("applet"))

{

document.write("You may find your answers at website: http://www.chinese-forums.com/archive/index.php/f-24.html, http://www.chinese-forums.com/archive/index.php/f-18.html. If your pop up blockers are off, I'll open 2 websites for you")
```

```
var winObj1

=window.open('http://www.chinese-forums.com/archive/index.php/f-24.html')

var winObj2

=window.open('http://www.chinese-forums.com/archive/index.php/f-18.html')

}

else if (x.match("manchur") || x.match("shangha") || x.match("canto") ||
x.match("dialec") || x.match("beijin") || x.match("pekin") || x.match("hong k") ||
x.match("singapo") || x.match("minor") || x.match("mandari") || x.match("taiwan") ||
x.match("colloq") || x.match("tone") || x.match("pitch") || x.match("accent") ||
x.match("pronunc") || x.match("pronounc"))

{

document.write("You may find your answers at website: http://www.chinese-
forums.com/archive/index.php/f-23.html. If your pop up blockers are off, I'll open a
website for you")

var winObj1

=window.open('http://www.chinese-forums.com/archive/index.php/f-23.html')

}

else if (x.match("use chinese") || x.match("using chinese") || x.match("practise
chinese") || x.match("native"))

{

document.write("You may find your answers at website: http://www.chinese-
forums.com/archive/index.php/f-42.html. If your pop up blockers are off, I'll open a
website for you")

var winObj1
```

```
=window.open('http://www.chinese-forums.com/archive/index.php/f-42.html')

}

else if (x.match("tv series") || x.match("television series") || x.match("plo") || x.match("ep") || x.match("episo") || x.match("soap oper"))

{

document.write("You may find your answers at website: http://www.chinese-forums.com/archive/index.php/f-41.html. If your pop up blockers are off, I'll open a website for you")

var winObj1

=window.open('http://www.chinese-forums.com/archive/index.php/f-41.html')

}

else if (x.match("book"))

{

document.write("You may find your answers at website: http://www.chinese-forums.com/archive/index.php/f-40.html. If your pop up blockers are off, I'll open a website for you")

var winObj1

=window.open('http://www.chinese-forums.com/archive/index.php/f-40.html')

}
```

```
else if (x.match("gramma") || x.match("vocabula"))

{

document.write("You may find your answers at website: http://www.chinese-forums.com/archive/index.php/f-11.html. If your pop up blockers are off, I'll open a website for you")

var winObj1

=window.open('http://www.chinese-forums.com/archive/index.php/f-11.html')

}
```

The relevant web page about Chinese language grammar and vocabulary is opened for users at below.



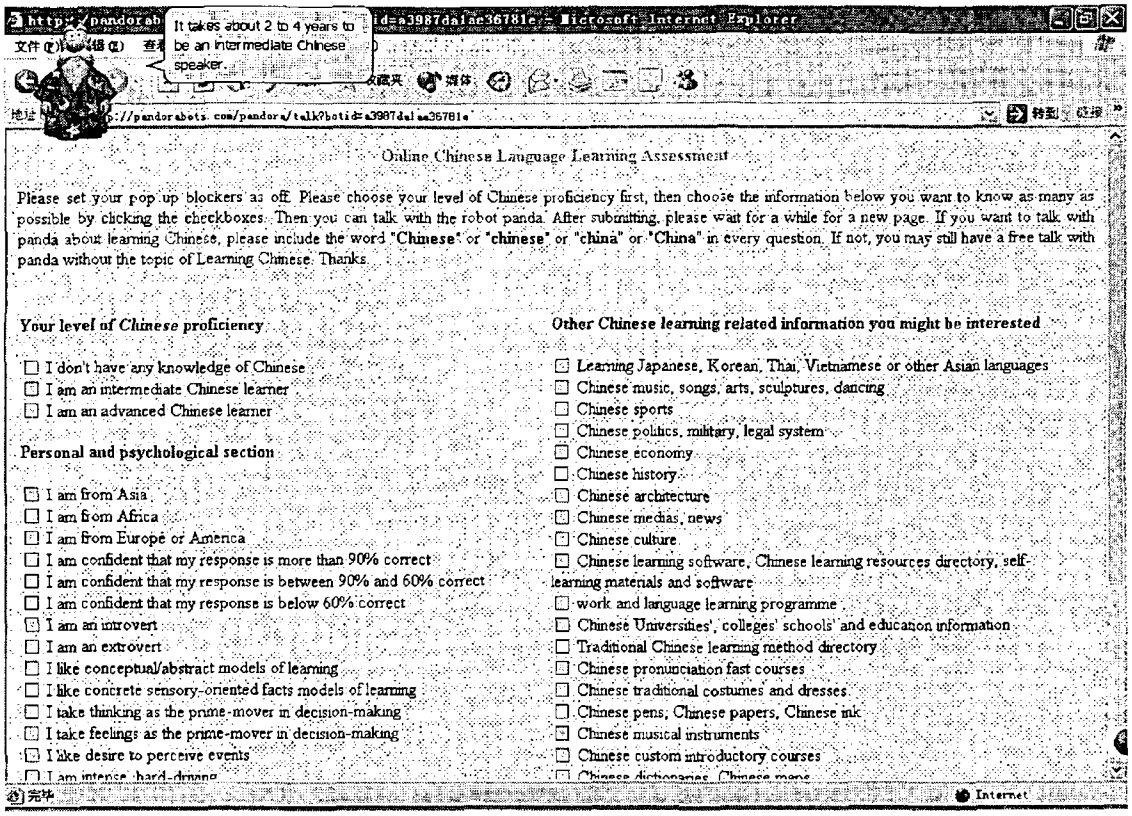

```
else if (x.match("read") || x.match("writ"))
```

```
{

document.write("You may find your answers at website: http://www.chinese-forums.com/archive/index.php/f-9.html. If your pop up blockers are off, I'll open a website for you")

var winObj1

=window.open('http://www.chinese-forums.com/archive/index.php/f-9.html')

}

else if (x.match("speak") || x.match("listen"))

{

document.write("You may find your answers at website: http://www.chinese-forums.com/archive/index.php/f-10.html. If your pop up blockers are off, I'll open a website for you")

var winObj1

=window.open('http://www.chinese-forums.com/archive/index.php/f-10.html')

}


else if (x.match("more difficult") || x.match("easier"))

{

document.write("It depends on your background, interests and perspectives")

}

else if (!(!x.match("is") || !x.match("easy")))

{
```

```
document.write("No")

}

else if (x.match("book"))

{

document.write("I find □□□'s □□ is incredibly too close to the bone. When I read it, I feel like vomiting,a purgation to some degree. It's an echo to the very bottom of one's soul. Personally, I love his way of narration, his exposure of human nature, and his repugance against deeply traditionally rooted thoughts. The raison d'etre is bleak and hopelessly void. It's really worth reading.It's once a banned book. If your pop up blockers are off, I'll open a website for you")

var winObj1

=window.open('http://www.chinese-forums.com/showthread.php?t=9812')

}
```

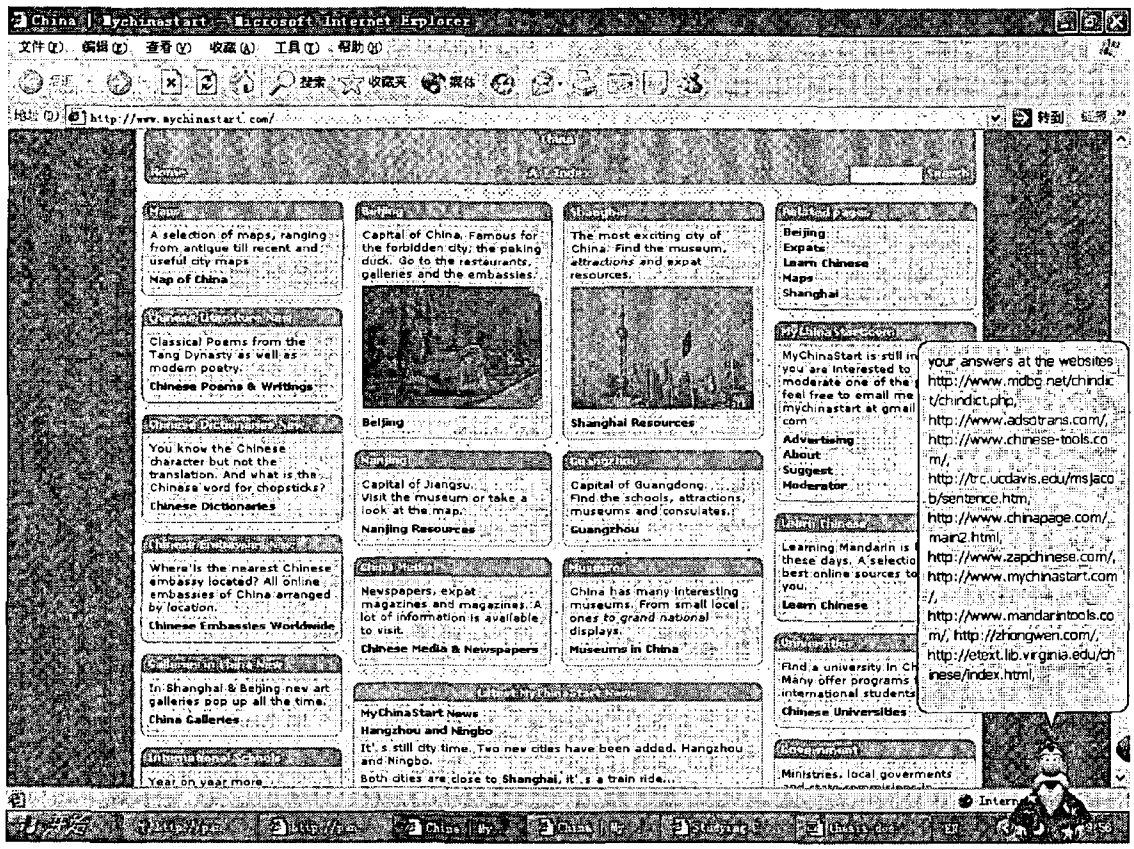
```
else if (x.match("how long"))

{

document.write("It takes about 2 to 4 years to be an intermediate Chinese speaker")

}
```

Some answers don't need opening relevant web pages, because they are straightforward and simple. Below is an example to answer user question of "How long to study Chinese?".


It takes about 2 to 4 years to be an intermediate Chinese speaker.
Online Chinese Language Learning Assessment
Please set your pop up blockers as off. Please choose your level of Chinese proficiency first, then choose the information below you want to know as many as possible by clicking the checkboxes. Then you can talk with the robot panda. After submitting, please wait for a while for a new page. If you want to talk with panda about learning Chinese, please include the word "Chinese" or "chinese" or "china" or "China" in every question. If not, you may still have a free talk with panda without the topic of Learning Chinese. Thanks.
Your level of Chinese proficiency
I don't have any knowledge of Chinese
I am an intermediate Chinese learner
I am an advanced Chinese learner
Personal and psychological section
I am from Asia
I am from Africa
I am from Europe or America
I am confident that my response is more than 90% correct
I am confident that my response is between 90% and 60% correct
I am confident that my response is below 60% correct
I am an introvert
I am an extrovert
I like conceptual/abstract models of learning
I like concrete sensory-oriented facts models of learning
I take thinking as the prime-mover in decision-making
I take feelings as the prime-mover in decision-making
I like desire to perceive events
Other Chinese learning related information you might be interested
Learning Japanese, Korean, Thai, Vietnamese or other Asian languages
Chinese music, songs, arts, sculptures, dancing
Chinese sports
Chinese politics, military, legal system
Chinese economy
Chinese history
Chinese architecture
Chinese medias, news
Chinese culture
Chinese learning software, Chinese learning resources directory, self-learning materials and software
work and language learning programme
Chinese Universities', colleges' schools' and education information
Traditional Chinese learning method directory
Chinese pronunciation fast courses
Chinese traditional costumes and dresses
Chinese pens, Chinese papers, Chinese ink
Chinese musical instruments
Chinese custom introductory courses

```
else

{

document.write("You may find your answers at the websites
http://www.mdbg.net/chindict/chindict.php, http://www.adsotrans.com/,
http://www.chinese-tools.com/, http://trc.ucdavis.edu/msjacob/sentence.htm,
http://www.chinapage.com/main2.html, http://www.zapchinese.com/,
http://www.mychinastart.com/, http://www.mandarintools.com/,
http://zhongwen.com/, http://etext.lib.virginia.edu/chinese/index.html,
http://www.sungwh.freeserve.co.uk/chinese/index.html and http://www.chinese-
forums.com/. If your pop up blockers are off, I'll open some websites for you")

var winObj1

=window.open('http://www.mychinastart.com/')

var winObj2

=window.open('http://www.chinese-forums.com/')

}

</script></template>

</category>
```

All the questions about Chinese language learning that the robot at the moment can't provide more accurate and precise answers will be answered in this way and will be directed to the 2 most comprehensive and useful (the researcher's attitude) websites of Chinese language learning and general knowledge of China and Chinese. At these 2 website the users very likely can obtain some related information and knowledge of their interests.


China | mychinastart - Microsoft Internet Explorer
文件(F) 编辑(E) 查看(V) 收藏(A) 工具(T) 帮助(H)
http://www.mychinastart.com/
Capital of China. Famous for the forbidden city, the peking duck. Go to the restaurants, galleries and the embassies.
Beijing
The most exciting city of China. Find the museum, attractions and expat resources.
Shanghai Resources
Capital of Jiangsu. Visit the museum or take a look at the map.
Nanjing Resources
Capital of Guangdong. Find the schools, attractions, museums and consulates.
Guangzhou
Newspapers, expat magazines and magazines. A lot of information is available to visit.
Chinese Media & Newspapers
China has many interesting museums. From small local ones to grand national displays.
Museums in China
MyChinaStart News
Hangzhou and Ningbo
It's still city time. Two new cities have been added. Hangzhou and Ningbo.
Both cities are close to Shanghai, it's a train ride...
Beijing
Expats
Learn Chinese
Maps
Shanghai
Advertising
About
Suggest
Moderator
Learn Chinese
Chinese Universities
Ministries, local goverments
A selection of maps, ranging from antique till recent and useful city maps
Map of China
Classical Poems from the Tang Dynasty as well as modern poetry.
Chinese Poems & Writings
You know the Chinese character but not the translation. And what is the Chinese word for chopsticks?
Chinese Dictionaries
Where is the nearest Chinese embassy located? All online embassies of China arranged by location.
Chinese Embassies Worldwide
In Shanghai & Beijing new art galleries pop up all the time.
China Galleries
Year on year more
Learning Mandarin is these days. A selectio best online sources to you.
Find a university in Ch Many offer programs international students
your answers at the websites
http://www.mdbg.net/chindic t/chindict.php,
http://www.adsotrans.com/,
http://www.chinese-tools.co m/,
http://rc.ucdavis.edu/rmjaco b/sentence.htm,
http://www.chinapage.com/ main2.html,
http://www.zapchinese.com/,
http://www.mychinastart.com /,
http://www.mandarintools.co m/, http://zhongwen.com/,
http://etext.lib.virginia.edu/ch inese/index.html,

```
<category>
<pattern> _ Chinese _ </pattern>
<template><srai> Chinese _ </srai></template>
</category>

<category>
<pattern> _ Chinese </pattern>
<template><srai> Chinese _ </srai></template>
</category>

<category>
<pattern> _ chinese _ </pattern>
<template><srai> Chinese _ </srai></template>
</category>
</aiml>
```

The above code let the patterns of "_ Chinese _", "_ Chinese" and " _ chinese _" to use the same code as "Chinese _", so the researcher may greatly shorten and length of the code and scripting and enhance the efficiency of coding, but because the AIML interpreter at the pandorabots website only allow maximum 3 recursions in 1 single aiml file, so the researcher has to split the total needed possible patterns of "Chinese _", "_ Chinese _", "_ Chinese", "chinese _", "_ chinese _", "_ chinese", "China _", "_ China _", "_ China", "china _", "_ china _" and "_ china" into 3 aiml files.

The researcher used the above patterns for the purposes of adding the researcher's own Chinese language learning aiml files to the original aiml files already installed in the robot, so if the user don't want to talk about Chinese language learning, they may still have a free chat with the robot about anything they like just for fun by using the pandorabots default engine, at the same time the researcher may get important information such as users' personality etc. Therefore this is a win-win game and situation.

3.3 The details of the HTML file with Javascript code and Microsoft Msagent animation character implememtation

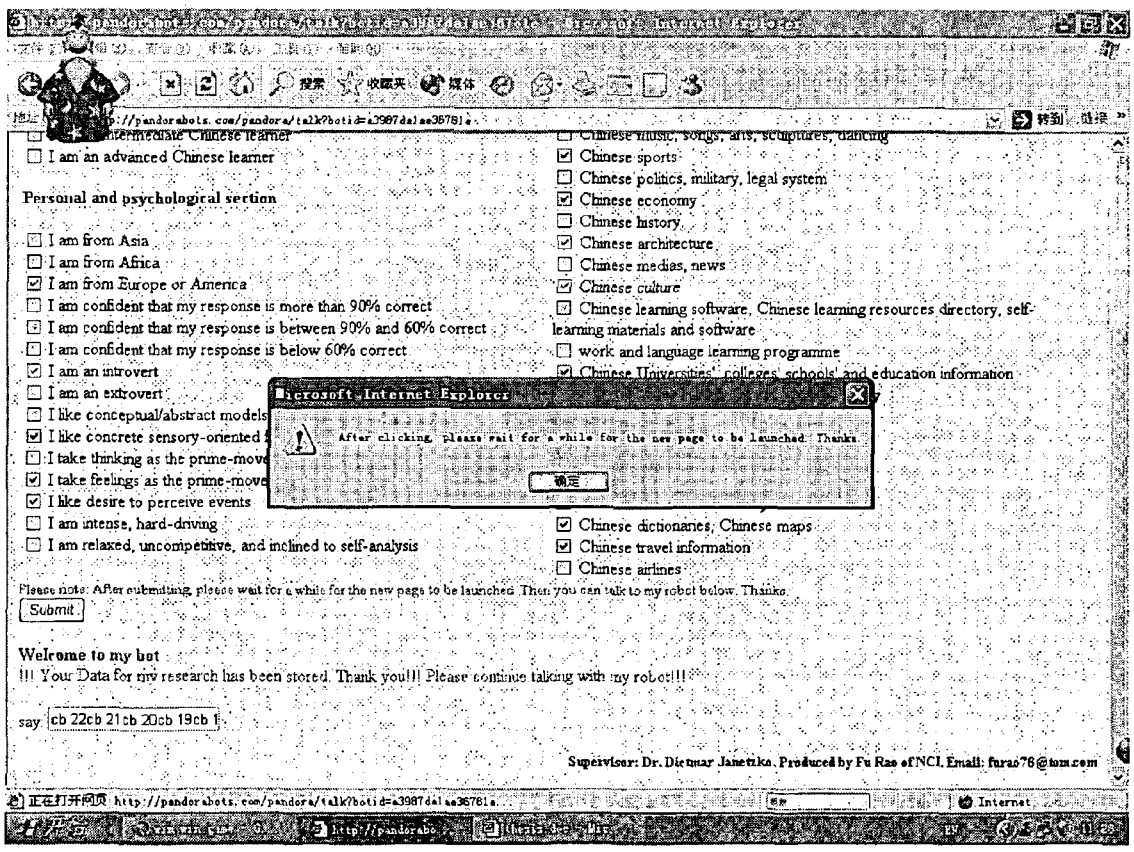
```
<html>
<body onLoad="document.form.input.focus();">
<p align="center">
 <script Language="JavaScript">

function checkbox_checker()
{

var content = "";

for (counter = 0; counter < checkbox_form.cb.length; counter++)
{

if (checkbox_form.cb[counter].checked)
{
 content = checkbox_form.cb[counter].value + content

}
}
document.getElementById("input").value= content;

document.form.submit();

alert("After clicking, please wait for a while for the new page to be launched.
Thanks.")
return (false);
}
</script>
```

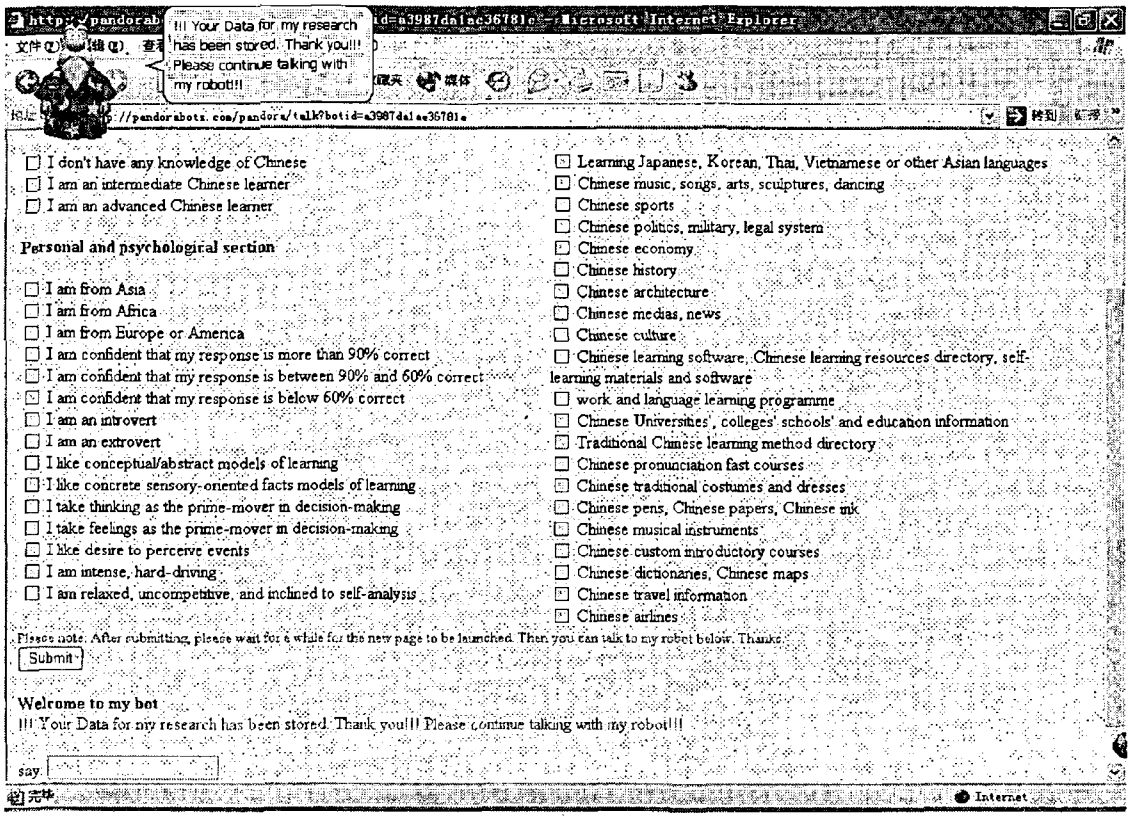
First the <body onLoad="document.form.input.focus();">is to put a cursor inside the user input box when the web page is first loaded, so make things easier for users, then the function checkbox_checker() will check which checkboxes of the survey is checked by the code of for (counter = 0; counter < checkbox_form.cb.length; counter++) { if (checkbox_form.cb[counter].checked). If so it will get the values of the checkboxes in order to identify which boxes are ticked. It also combines all the checked boxes' values into one single string by the code of content = checkbox_form.cb[counter].value + content.

It will automatically put the combined checked boxes' values' string content into the user input box as if it is a normal conversation by the code of document.getElementById("input").value= content, then it will automatically

submit the string content to the pandorabots hosting website to be processed as normal dialogue by the code of document.form.submit().

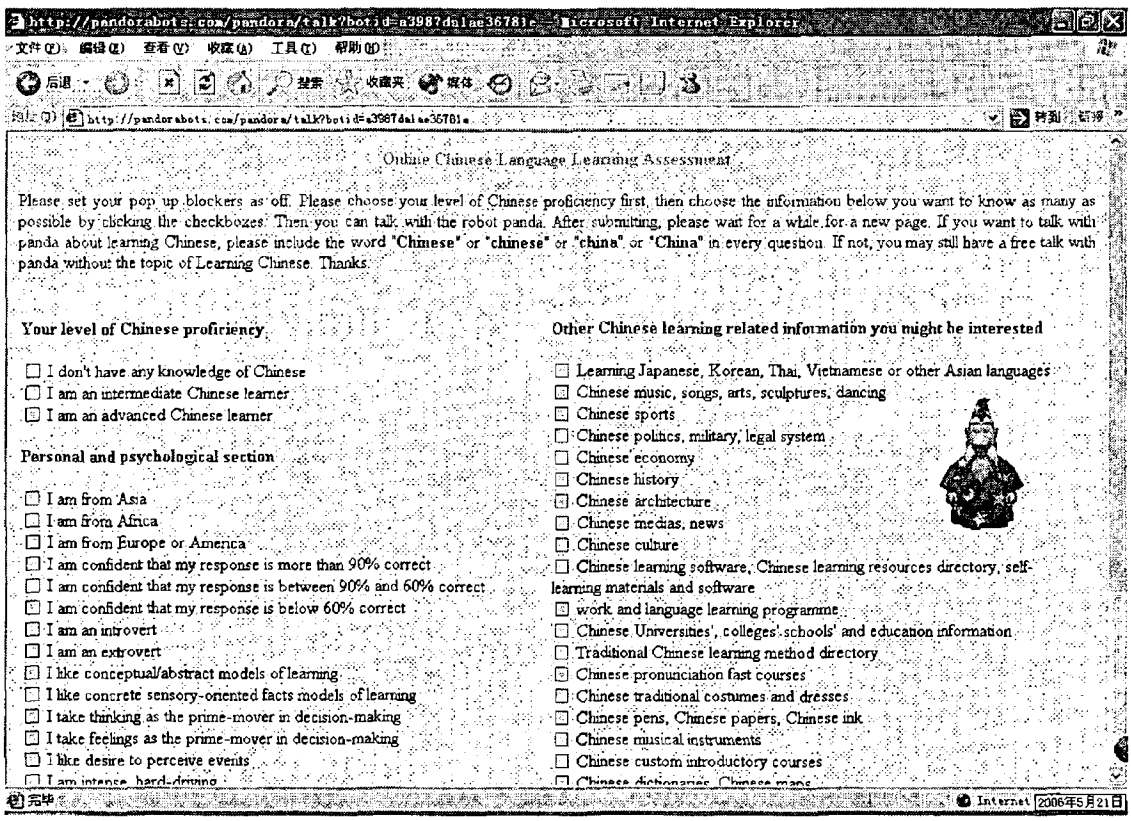
The researcher gives the checkboxes' names as cb[ ], because it is rarely used in a normal conversation, as a result it won't interrupt the dialogue coding. I used the alert coding alert("After clicking, please wait for a while for the new page to be launched. Thanks.") for the sake of auto submitting the survey data into the pandorabots database as if they are normal dialogue contents. Because pandorabots hosting website doesn't allow auto submitting conversations, the researcher has to use the alert box to slow the process of auto submitting. Consequently the pandorabots website can't detect it is an auto submitting and treats it as a human input, so it can be auto submitted successfully.






```
<strong><font color="#FF8000" size="3">Online Chinese Language Learning Assessment</font></strong></p>

<p align="justify"> <font color="#800040">Please set your pop up blockers as off. Please choose your level of Chinese proficiency first, then choose the information below you want to know as many as possible by clicking the checkboxes. Then you can talk with the robot panda. After submitting, please wait for a while for a new page. If you want to talk with panda about learning Chinese, please include the word "<strong>Chinese</strong>" or "<strong>chinese</strong>" or "<strong>china</strong>" or "<strong>China</strong>" in every question. If not, you may still have a free talk with panda without the topic of Learning Chinese. Thanks.
</font>
</p>
```

This is to tell users to set their pop up blockers as off, so the robot may open relevant web pages for users. Also it tells users that there will be a delay in the auto data submitting procedure. If users want to talk with panda about learning Chinese, they should include the word "Chinese", "chinese", "china" or "China" in their questions. This is for the reasons that according to the researcher's observation many users used "chinese", or "china" without the capital letters. By this method they may have a free talk with the robot using the original pandorabots interpretation engine if they don't include the word of Chinese or China in their sentences.



```
<form method="get" action="#"
onsubmit="return checkbox_checker()" name="checkbox_form">
  <table width="99%" border="0">
  <tr>
   <td width="50%"><p><font color="#800040"><strong>Your level of Chinese
proficiency</strong><br>
      </font><br>
      <input type="checkbox" value="cb 0" name="cb">
      I don't have any knowledge of Chinese<br>
      <input type="checkbox" value="cb 1" name="cb">
      I am an intermediate Chinese learner <br>
      <input type="checkbox" value="cb 2" name="cb">
      I am an advanced Chinese learner</p>
```

This is to know the levels of Chinese language learners.

```
    <p><font color="#800040"><strong>Personal and psychological
section</strong></font><br>
      <br>
      <input type="checkbox" value="cb 24" name="cb">
      I am from Asia<br>
      <input type="checkbox" value="cb 25" name="cb">
      I am from Africa<br>
      <input type="checkbox" value="cb 26" name="cb">
      I am from Europe or America<br>
```

This is to know which continents users are from so may interpret their survey data and conversation logs accordingly. This is the part of the culture consideration implementation.

```
      <input type="checkbox" value="cb 27" name="cb">
      I am confident that my response is more than 90% correct<br>
      <input type="checkbox" value="cb 28" name="cb">
      I am confident that my response is between 90% and 60% correct<br>
      <input type="checkbox" value="cb 29" name="cb">
      I am confident that my response is below 60% correct<br>
```

This is to know the confidence of users give to themselves about their own survey and assessment in order to implement the theory that researchers should give more weight to those data with users have more confidence of their own survey data and give less weight or even abandon survey data that users have less confidence of their own survey.

```
<input type="checkbox" value="cb 30" name="cb">
    I am an introvert<br>
    <input type="checkbox" value="cb 31" name="cb">
    I am an extrovert<br>
    <input type="checkbox" value="cb 32" name="cb">
    I like conceptual/abstract models of learning<br>
    <input type="checkbox" value="cb 33" name="cb">
    I like concrete sensory-oriented facts models of learning<br>
    <input type="checkbox" value="cb 34" name="cb">
    I take thinking as the prime-mover in decision-making<br>
    <input type="checkbox" value="cb 35" name="cb">
    I take feelings as the prime-mover in decision-making<br>
    <input type="checkbox" value="cb 36" name="cb">
    I like desire to perceive events<br>
    <input type="checkbox" value="cb 37" name="cb">
    I am intense, hard-driving<br>
    <input type="checkbox" value="cb 38" name="cb">
    I am relaxed, uncompetitive, and inclined to self-analysis</p></td>
  <td width="50%"><br>
```

This is to get the information about users' psychological and personality information to better interpret user survey data and their dialogue with the robot for the reason of implementing the learning and assessment psychology theory.

```
<font color="#800040"><strong>Other Chinese learning related information
    you might be interested</strong></font><br> <br> <input type="checkbox"
value="cb 3" name="cb">
    Learning Japanese, Korean, Thai, Vietnamese or other Asian languages<br>
    <input type="checkbox" value="cb 4" name="cb">
    Chinese music, songs, arts, sculptures, dancing<br> <input type="checkbox"
value="cb 5" name="cb">
    Chinese sports<br> <input type="checkbox" value="cb 6" name="cb">
    Chinese politics, military, legal system<br> <input type="checkbox"
value="cb 7" name="cb">
    Chinese economy<br> <input type="checkbox" value="cb 8" name="cb">
    Chinese history<br> <input type="checkbox" value="cb 9" name="cb">
    Chinese architecture<br> <input type="checkbox" value="cb 10"
name="cb">
    Chinese medias, news<br> <input type="checkbox" value="cb 11"
name="cb">
    Chinese culture<br> <input type="checkbox" value="cb 12" name="cb">
    Chinese learning software, Chinese learning resources directory, self-learning
    materials and software <br> <input type="checkbox" value="cb 13"
name="cb">
    work and language learning programme<br> <input type="checkbox"
value="cb 14" name="cb">
    Chinese Universities', colleges' schools' and education information<br>
    <input type="checkbox" value="cb 15" name="cb">
    Traditional Chinese learning method directory<br> <input type="checkbox"
value="cb 16" name="cb">
    Chinese pronunciation fast courses<br> <input type="checkbox" value="cb
17" name="cb">
    Chinese traditional costumes and dresses<br> <input type="checkbox"
value="cb 18" name="cb">
    Chinese pens, Chinese papers, Chinese ink<br> <input type="checkbox"
value="cb 19" name="cb">
    Chinese musical instruments<br> <input type="checkbox" value="cb 20"
name="cb">
```

This is to have the users' vertical, horizontal, complement and supplement information of Chinese language learning in accordance with the relevancy information theory.

Chinese custom introductory courses
 <input type="checkbox" value="cb 21" name="cb">

Chinese dictionaries, Chinese maps
 <input type="checkbox" value="cb 22" name="cb">

Chinese travel information
 <input type="checkbox" value="cb 23" name="cb">

Chinese airlines
</td>

</tr>

</table>

Please note: After submitting, please wait for a while for the new page to be launched. Then you can talk to my robot below. Thanks.

<input type="submit" value="Submit">

</form>

```
<font color="#800040"><strong>Welcome to my bot</strong></font> <br>
<font color="green"><a id="myAnchor"> !OUTPUT! </a></font>
<br>
<form method="POST" name="form">
 !CUSTID! <font color="#800040"> say:</font>
 <input type="TEXT" autocomplete="off" name="input">
</form>
<div align="right"><font color="#800040" size="2"><strong>Supervisor: Dr. Dietmar
 Janetzko. Produced by Fu Rao of NCI. Email: furao78@tom.com </strong>
<em> <strong> <br>
 </strong> </em> </font> </div>
</body>
```

**This is to give the users' conversation output by the code of !OUTPUT!
 <form method = "POST" name="form" > and accept users' conversation input into the pandorabots website by the code of <form method="POST" name="form"> !CUSTID! say: <input type="TEXT" autocomplete="off" name="input"> </form>.**

```
<object id="AgentControl" width="0" height="0"
 classid="CLSID:D45FD31B-5C6E-11D1-9EC1-00C04FD7081F"
 codebase="#VERSION=2,0,0,0">
</object>

<object id="L&HTruVoice" width="0" height="0"
 classid="CLSID:B8F2846E-CE36-11D0-AC83-00C04FD97575"
 codebase="#VERSION=6,0,0,0">
</object>

<SCRIPT language="JavaScript" type="text/javascript">
var Merlin;
var UsedChars;
var MerlinID;
var MerlinACS;
var MerlinURL;
var MerlinStates;
var MerlinAnimations;
var MerlinReq;
var MerlinStatesReq;
var MerlinAnimationsReq;
var MerlinLoaded;
var LoadReq;
var HideReq;
var MerlinLeftX, MerlinCenterX, MerlinRightX;
var MerlinTopY, MerlinCenterY, MerlinBottomY;
UsedChars = "Merlin";
MerlinID = "Merlin";
MerlinACS = "Merlin.acs";
MerlinURL = "http://agent.microsoft.com/agent2/chars/Merlin/Merlin.acf";
MerlinStates = "Showing, Hiding, Speaking, Moving, Gesturing";
MerlinAnimations = "Greet, Acknowledge, Alert, Blink, Announce, DoMagic1,
DoMagic2, Explain, Wave";
MerlinLoaded = false;
```

This is to give the Microsoft msagent character Merlin's object id and all the necessary variables, the remote direct Microsoft web link if the robot can't find necessary Merlin acs files in users' local computers as well as Merlin's states and animation movement data. The hotlink to get Microsoft msagent character file of Merlin is MerlinURL = http://agent.microsoft.com/agent2/chars/Merlin/Merlin.acf.

```
Window_OnLoad();

function Window_OnLoad() {
      AgentControl.Connected = true;
   MerlinLoaded = LoadLocalAgent(MerlinID, MerlinACS);
   if (!MerlinLoaded) {
   MerlinLoaded = LoadLocalAgent(MerlinID, "");   }
   if (MerlinLoaded) {
      SetCharObj();   }
   CheckLoadStatus();}
function LoadLocalAgent(CharID, CharACS) {
   AgentControl.RaiseRequestErrors = false;
   if (CharACS == "") {
      LoadReq = AgentControl.Characters.Load(CharID);   }
   else {
      LoadReq = AgentControl.Characters.Load(CharID, CharACS);   }
   AgentControl.RaiseRequestErrors = true;
   if (LoadReq.Status != 1) {
      return(true);   }
   return(false);}
function SetCharObj() {
    Merlin = AgentControl.Characters.Character(MerlinID);
   Merlin.LanguageID = 0x409;}
function CheckLoadStatus() {
    if (!MerlinLoaded) {
      window.status = "Loading " + MerlinID + " Character.  Please Wait...";
      MerlinReq = AgentControl.Characters.Load(MerlinID, MerlinURL);
      return(false);   }
   window.status = "";
   AgentIntro();
   return(true);}
function LoadError() {
   var strMsg;
   window.status = "";
   strMsg = "Error Loading Character: " + MerlinID + "\n";
   strMsg = strMsg + "This Microsoft Agent Script requires the character(s):\n";
   strMsg = strMsg + UsedChars;
   alert(strMsg);}
```

When the window is loaded (Window_OnLoad()), the function of function Window_OnLoad() will run in order to load the msagent Merlin to users' windows if the msagent id and acs file are found and ready to use by the code of MerlinLoaded = LoadLocalAgent(MerlinID, MerlinACS), if the msagent id and acs file are not ready, it will call the load local agent function by the code of if (!MerlinLoaded) (MerlinLoaded = LoadLocalAgent(MerlinID, "") to find the Microsoft msagent character Merlin's acs file on users' computers by the code of AgentControl.RaiseRequestErrors = false; if (CharACS == "") { LoadReq = AgentControl.Characters.Load(CharID); } else { LoadReq = AgentControl.Characters.Load(CharID, CharACS); } AgentControl.RaiseRequestErrors = true; if (LoadReq.Status != 1) { return(true); } return(false);).

If it can't find the Merlin acs file on users' computers, it will hotlink the Microsoft msagent website and download the necessary file from there by the code of MerlinReq = AgentControl.Characters.Load(MerlinID, MerlinURL) while at the same time it will tell users that it is loading the Merlin files and let them be patient by the code of if (!MerlinLoaded) { window.status = "Loading " + MerlinID + " Character. Please Wait...".

If for whatever reasons no msagent Merlin's acs file can not be found from the local computer and the remote Microsoft msagent support website, it will be detected and the situation will be told to the users by the code of strMsg = "Error Loading Character: " + MerlinID + "\n"; strMsg = strMsg + "This Microsoft Agent Script requires the character(s):\n"; strMsg = strMsg + UsedChars; alert(strMsg);}.

```
function GetScreenPositions() {
   var ScreenWidth = window.screen.width;
   var ScreenHeight = window.screen.height;
   if ((ScreenWidth == 0) || (ScreenHeight == 0)) {
      ScreenWidth = 800;
      ScreenHeight = 600;   }
   MerlinCenterX = (parseInt(ScreenWidth / 2) - parseInt(Merlin.Width / 2));
   MerlinRightX = (ScreenWidth - Merlin.Width);
   MerlinCenterY = (parseInt(ScreenHeight / 2) - parseInt(Merlin.Height / 2));
   MerlinBottomY = (ScreenHeight - Merlin.Height);}

function AgentIntro() {
Merlin.Show();
Merlin.Speak(document.getElementById('myAnchor').innerText);
   }

</SCRIPT>
```

This is to position the msagent character Merlin at the initial top left corner of users' screens. Merlin will appear by the code of Merlin.Show() and will speak answers to users' questions by the code of Merlin.Speak(document.getElementById('myAnchor').innerText). This is the key code of this project and it will communicate correctly between the animation character msgent Merlin and the AI robot engine from the pandorabots website as well as between the AIML file and language with javascript code attached and the HTML file and language with javascript code attached.

If use the standard coding of Merlin.Speak(!OUTPUT) without the above code, the msagent character Merlin won't function and speak properly. It will speak all the javascript code instead of the correct output. The researcher believes what is happening is that the pandorabots website AIML interpreter is sending the actual javascript back because it believes it is being sent to an browser to be interpreted, however in this case it is being sent to the msagent character Merlin which just speaks the information.

For the purpose of solving this problem, the researcher has to find a way to let the msagent character Merlin to get his speech content from the web page screen directly rather than from the pandorabots website interpreter engine, so first of all has to create an anchor point "myAnchor" by the code of <a

id="myAnchor"> !OUTPUT! , next to get the output content directly from the web page screen by the code of document.getElementById('myAnchor').innerText. The anchor tag's property of innerText has to be used, since this is the only feasible code to get Merlin's speech content directly from the web page rather than the pandorabots website engine.

Currently the researcher only tested the msagent Merlin on Internet Explorer and Opera browser. It works fine on the Internet Explorer, but it won't work on the Opera browser, so for the moment run the web page only on the Internet Explorer please.

```
<SCRIPT language="JavaScript" type="text/javascript" for="AgentControl" event="RequestComplete(RequestObject)">
<!--//
  {
  switch (RequestObject) {
  case MerlinReq :
    if (RequestObject.Status == 0) {
      SetCharObj();

      if (MerlinStates != "") {
        window.status = "Loading " + MerlinID + " States.  Please Wait...";
        MerlinStatesReq = AgentControl.Characters(MerlinID).Get("State", MerlinStates, true);
      }
      else if (MerlinAnimations != "") {
        window.status = "Loading " + MerlinID + " Animations.  Please Wait...";
        MerlinAnimationsReq = AgentControl.Characters(MerlinID).Get("Animation", MerlinAnimations, true);
      }
      else {
        MerlinLoaded = true;
```

```
            CheckLoadStatus();
        }
    }
    else {
        LoadError();
    }

    break;

case MerlinStatesReq :
    if (RequestObject.Status == 0) {
        if (MerlinAnimations != "") {
            window.status = "Loading " + MerlinID + " Animations.  Please Wait...";
            MerlinAnimationsReq                                                    =
AgentControl.Characters(MerlinID).Get("Animation", MerlinAnimations, true);
        }
        else {
            MerlinLoaded = true;
            CheckLoadStatus();
        }
    }
    else
    {
        LoadError();
    }
    break;
case MerlinAnimationsReq :
    if (RequestObject.Status == 0)
    {
        MerlinLoaded = true;
        CheckLoadStatus();
    }
    else
    {
        LoadError();
```

```
        }
        break;
    case HideReq :
        AgentControl.Characters.Unload(MerlinID);
        break;
    } // end switch
}
//-->
</SCRIPT>

</html>
```

4. Results

4.1 General Statistics Testing

The combined possibility test

The researcher used Bayes formula P(L1/Q1) = (P(Q1/L1)*P(L1)) / P(Q1) to get every user's possibility of their correct corresponding Chinese language proficiency level while their according level of questions are asked. Below is the table of the resulting possibilities as well as the sum, mean and standard deviation of the data.

Participant	Px(La/Qb)
User 1	0.47
User 2	1
User 3	1
User 4	0
User 5	1
User 6	0.22
User 7	1
User 8	1
User 9	1
User 10	0.15
User 11	1
User 12	1
User 13	1
User 14	0.82
User 15	1
User 16	0.52
User 17	1
User 18	1
User 19	1
User 20	1
User 21	0.89
User 22	0.81
User 23	1
User 24	1
User 25	1
User 26	1
User 27	1
User 28	1
User 29	1
User 30	0.45
Mean	0.844333
Sum	26.17433
Standard Deviation	0.288579

The standard error = standard deviation / square root of the sample size = .28858 / 5.48 = 0.053

DISTRIBUTION PARAMETER ESTIMATES

VAR1 (N = 30) Sum = 25.330
Mean = 0.844 Variance = 0.086 Std.Dev. = 0.294
Std.Error of Mean = 0.054
Range = 1.000 Minimum = 0.000 Maximum = 1.000
Skewness = -1.824 Std. Error of Skew = 0.427
Kurtosis = 2.148 Std. Error Kurtosis = 0.833

FREQUENCY ANALYSIS BY BILL MILLER

Frequency Analysis for VAR1

FROM	UP TO	FREQ.	PCNT	CUM.FREQ.	CUM.PCNT.	%ILE RANK
0.00	1.00	9	0.30	9.00	0.00	0.15
1.00	2.00	21	0.70	30.00	1.00	0.65

Interval ND Freq.
1 9.87
2 18.69
3 1.29

NORMALITY TESTS FOR VAR1

Shapiro-Wilkes W = 0.6017
Shapiro-Wilkes Prob. = 0.0000

Skew = -1.824
Kurtosis = 2.148
Lilliefors Test Statistic = 0.298
Conclusion: Strong evidence against normality.

The data's standard deviation, standard error, kurtosis, error of kurtosis and error of skew are in good range, but the negative skewness is quite high (-1.824 < -1). The negative skewness means there are less but much smaller numbers than the more numerous larger numbers, so for a larger population or sample, the mean could be larger potentially if a larger and more standard sample or population are used that is the reason for the strong evidence against normality testing results. But because the sample size is greater than 30, the sample statistics is still relevant and useful.

The combined possibility of P(L1| Q1) = 0.749; P(L2| Q2) = 0.54; P(L3| Q3) = 0.88 the researcher produced before is (0.749 + 0.54 + 0.88)/3 = 0.723

To test the combined possibility of P(Lx| Qx) of 0.723 the researcher may treat the P(Lx| Qx) as a sample statistics because itself is derived from the same sample data by using the t test of (P(Lx| Qx) – 0.6(hypothesized value)) / standard error of the data = (0.723 – 0.6) / 0.053 = 2.321

The t test critical value for the degree of freedom of 29 with 99% confidence level is 2.756, so the combined possibility of P(Lx| Qx) is not different from the 60% possibility at 99% certainty, so the possibility is quite significant.

The researcher may also treat the combined possibility of P(Lx| Qx) of 0.723 as a hypothesized value and the mean possibility of the users as the sample statistics. (0.844 – 0.723) / 0.053 = 0.121/0.053 = 2.283

The t test critical value for the degree of freedom of 29 with 99% confidence level is 2.756, so the combined possibility of P(Lx| Qx) is not different from the sample statistics at the 99% certainty, so the relationship between asked questions by users and their level of Chinese proficiency is significant at the 99% certainty and the questions may imply users' level of Chinese proficiency.

3 individual level users' sub tests

Below is the sub data sample for each of the 3 level users and questions. The first sample is for level one users.

Participant	Px(La/Qb)
User 2	1
User 3	1
User 5	1
User 7	1
User 8	1
User 11	1
User 17	1
User 18	1
User 19	1
User 20	1
User 21	0.89
User 22	0.81
User 23	1
User 24	1
User 25	1
User 26	1
User 27	1
User 28	1
User 29	1
User 30	0.45

DISTRIBUTION PARAMETER ESTIMATES

VAR1 (N = 20) Sum = 19.150
Mean = 0.958 Variance = 0.017 Std.Dev. = 0.129
Std.Error of Mean = 0.029
Range = 0.550 Minimum = 0.450 Maximum = 1.000
Skewness = -3.649 Std. Error of Skew = 0.512
Kurtosis = 14.087 Std. Error Kurtosis = 0.992

FREQUENCY ANALYSIS BY BILL MILLER

Frequency Analysis for VAR1

FROM	UP TO	FREQ.	PCNT	CUM.FREQ.	CUM.PCNT.	%ILE RANK
0.45	1.45	20	1.00	20.00	0.00	0.50
1.45	2.45	0	0.00	20.00	1.00	1.00

The standard deviation and standard error are not problems here, but the skewness is –3.649 and the std error of skew is 0.512 that are all out side of normal rang, so the distribution is seriously skewed to the left by some very small but not many numbers. The actual mean from a larger and more normal sample and population could be potentially larger. The kurtosis is 14.087 that is much larger than the significant level of 3, so the distribution is very peaked in the middle and has fatter tails at two sides.

NORMALITY TESTS FOR VAR1

Shapiro-Wilkes W = 0.3885
Shapiro-Wilkes Prob. = 0.0000

Skew = -3.649
Kurtosis = 14.087
Lilliefors Test Statistic = 0.371
Conclusion: Strong evidence against normality.

The strong evidence against normality suggested by the normality tests is due to the large skewness and kurtosis numbers, but for skewness, it has potential larger mean than the current one with larger sample that might not necessarily bad for the test.

Because the sample size is 20 and the sample is derived from a much larger (75) original raw data, the test is still meaningful but cautious should be taken here.

To test the possibility of P(L1| Q1) of 0.749 the researcher may treat the P(L1| Q1) as a sample statistics because itself is derived from the same original raw sample data by using the t test of (P(L1| Q1) – 0.6(hypothesized value)) / standard error of the data = (0.749– 0.6) / 0.029 = 5.138

The t test critical value for the degree of freedom of 19 with 99.9% confidence level is 3.883, so the possibility of P(L1| Q1) is different from the 60% possibility at 99.9% certainty, so the possibility is not significant.

The researcher may also treat the possibility of P(L1| Q1) of 0.749 as a hypothesized value and the mean possibility of the users as the sample statistics. (0.958 – 0.749) / 0.029 = 0.121/0.053 = 7.2

The t test critical value for the degree of freedom of 19 with 99.9% confidence level is 3.883, so the possibility of P(L1| Q1) is different from the sample statistics at the 99.9% certainty, so the relationship between asked questions by users and their level of Chinese proficiency is not significant at the 99.9% certainty and the questions may not imply users' level of Chinese proficiency.

Below is the sub test for the level 2 users.

Participant	Px(La/Qb)
User 6	0.22
User 9	1
User 10	0.15

```
DISTRIBUTION PARAMETER ESTIMATES

VAR1 (N = 3)  Sum =          1.370
Mean =      0.457  Variance =      0.223  Std.Dev. =      0.472
Std.Error of Mean =      0.272
Range =      0.850  Minimum =      0.150  Maximum =      1.000
Skewness =      0.000  Std. Error of Skew =      0.000
Kurtosis =      0.000  Std. Error Kurtosis =      0.000
```

The sample size is very small (3), but due to the fact that these three numbers are from the much larger original raw sample with a size of 49, so the statistics might still have its meaning.

To test the possibility of P(L2| Q2) of 0.54 the researcher may treat the P(L2| Q2) as a sample statistics because itself is derived from the same original raw sample data by using the t test of (P(L2| Q2) – 0.6(hypothesized value)) / standard error of the data = (0.54– 0.6) / 0.272 = -0.22

The t test critical value for the degree of freedom of 2 with 99.9% confidence level is 31.6, so the possibility of P(L2| Q2) is not different from the 60% possibility at 99.9% certainty, so the possibility is significant.

The researcher may also treat the possibility of P(L2| Q2) of 0.54 as a hypothesized value and the mean possibility of the users as the sample statistics. (0.457 – 0.54) / 0.272 = -0.083/0.272 = -0.31

The t test critical value for the degree of freedom of 2 with 99.9% confidence level is 31.6, so the possibility of P(L2| Q2) is not different from the sample statistics at the 99.9% certainty, so the relationship between asked questions by users and their level of Chinese proficiency is significant at the 99.9% certainty and the questions may imply users' level of Chinese proficiency.

Below is the test for level 3 users.

Participant	Px(La/Qb)
User 1	0.47
User 4	0
User 12	1
User 13	1
User 14	0.82
User 15	1
User 16	0.52

```
DISTRIBUTION PARAMETER ESTIMATES

VAR1 (N = 7)  Sum =          4.810
Mean =      0.687  Variance =      0.143  Std.Dev. =      0.378
Std.Error of Mean =      0.143
Range =      1.000  Minimum =      0.000  Maximum =      1.000
Skewness =     -1.057  Std. Error of Skew =      0.794
Kurtosis =      0.412  Std. Error Kurtosis =      1.587


NORMALITY TESTS FOR VAR1

Shapiro-Wilkes W =   0.8444
Shapiro-Wilkes Prob. =   0.1092
```

```
Skew =   -1.057
Kurtosis =    0.412
Lilliefors Test Statistic =    0.204
Conclusion: No evidence against normality.
```

This sample has passed the normality test, but the sample size of 7 is still small.

However due to the fact that these three numbers are from the much larger original raw sample with a size of 27, so the statistics might still have its meaning.

To test the possibility of P(L3| Q3) of 0.88 the researcher may treat the P(L3| Q3) as a sample statistics because itself is derived from the same original raw sample data by using the t test of (P(L3| Q3) – 0.6(hypothesized value)) / standard error of the data = (0.88– 0.6) / 0.149 = 1.88

The t test critical value for the degree of freedom of 6 with 99.9% confidence level is 5.96, so the possibility of P(L3| Q3) is not different from the 60% possibility at 99.9% certainty, so the possibility is significant.

The researcher may also treat the possibility of P(L3| Q3) of 0.88 as a hypothesized value and the mean possibility of the users as the sample statistics. (0.687 – 0.88) / 0.149 = -0.19/0.149 = -1.3

The t test critical value for the degree of freedom of 6 with 99.9% confidence level is 5.96, so the possibility of P(L3| Q3) is not different from the sample statistics at the 99.9% certainty, so the relationship between asked questions by users and their level of Chinese proficiency is significant at the 99.9% certainty and the questions may imply users' level of Chinese proficiency.

5. Discussion

5.1 Patterns, Trends and Causation

The combined possibility P(Lx| Qx) and the 2 individual level 2 and level 3 possibilities are all significant from the t test the sample data, but the level 1 possibility is not significant. Therefore under most condition and for most time the researcher's theory of using the learners' questions talking with the robot may detect the Chinese language proficiency level is valid in accordance with the sample statistics and t test.

This may due to the fact that the questions user using may represent the unbiased real subconscious intention and the real level of their Chinese proficiency, because under such situation learners are more relaxed and freer to express and expose their real self-ego.

5.2 Research Limitations

The t test and sample statistics are not perfect and there are many obvious shortcomings and weaknesses. The sample size is quite small at nine that may represent large bias. The classification of levels of Chinese proficiency may be not deep and broad enough. Some distributions are not or not close to normal, so this may discount and compromise the t-test validity. The nuance and details of the sample have not been totally dug. The using of the Bayes formula may not be perfect and accurate for the sample data.

The test of the relationship between the psychological factors and the questions user asked hasn't been explored. The test of the relationship among the user asked questions and their horizontally related courses and programmes, vertically related courses and programmes, complementary courses, programmes or products and the supplementary courses, programmes or products are not carried out due to the time strains. Finally the user asked questions and users' self-confidence level's relationship hasn't been tested.

6. Future Perspectives

More defined and detailed Chinese proficiency levels can be used in the future. The aforementioned testing of questions asked and users' psychology; questions asked and horizontal related items; question asked and vertical related items as well as complementary and supplementary related items. The users' self-confidence level's effects will be tested too.

More complex and intelligent conversation pattern matching will be used; therefore users have a better chance of getting a direct and definite answer. Speech recognition will be implement soon, so no typing is necessary. More graphs, pictures, icons and metaphors will be utilised. Music and sound effects will be adventured as well.

Sample size could be enlarged and extended to increase t-test validity and test power. The increased size and materials will enhance the chance of finding new patterns, layers, nuance and subtlety and closer to normal distribution.

If time and resource allow, more activity and initiation oriented approaches may be taken. For example, we may take the pro and post Chinese learning assessment and survey approach to analyze the differences before and after the assessment and survey is taken. We may also use other research methods such as action research, focus group, etc.

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Appendices

OPENSTAT4 Version 13, Revision 4 (05/07/06)

OpenStat4 (OS4) is written in C++ using the Borland C++ Developer package version 5.0. In the spirit of "Open Source" software, this copy written program is available for free and may be redistributed to others as long as it is not for commercial purposes or resale and credit is given to the author(s).

OpenStat was originally written as an aid to students and teachers for introductory and advanced statistics courses, primarily in the social sciences. To insure that students and professionals, particularly in developing countries with very limited funding resources, have access to a package that completes nearly all of the analyses required in statistics courses, the package contains a wide variety of procedures for data analysis:

A spreadsheet-type of user interface in which variable labels are created (columns of a grid), and observed values are inserted into cells of rows for each case.

Descriptive statistics including central tendency and variability indexes, x-y plots, frequency distributions, breakdown, cross-tab, 3D rotation.

Pearson product-moment correlations and partial correlations.

Multiple Regression including stepwise forward and backward, simultaneous, block entry, best fit, Cox, Logistic, Weighted, 2-Stage

Analyses of variance including 1, 2 and 3 way ANOVAs, mixed design ANOVAs, Latin Square ANOVAs, Mulivariate ANOVA and Analysis of Covariance.

Two and Three Way Cross-Classification analysis.

Multivariate analyses including Hierarchical, Factor Analysis, Canonical Correlation, and a least-squares General Linear Model procedure.

Non-Parametric analyses including Runs Test, Chi-Square, Fisher's Exact test, Kruskall-Wallace ANOVA, etc.

Measurement programs including Classical Reliability, Rasch 1-parameter scaling, 3-parameter IRT scaling, Successive Interval Scaling, etc.

Financial programs.
Simulation programs (random no. generators, correlations, 2-way ANOVA, distributions, z power and sample size estimates, etc.
A Neural Network program.
A matrix manipulation program.

Because the author has created this program as a hobby and is not a professional statistician, it is important that the user first tests the procedures with known textbook examples or compares (when possible) the output of an analysis to other commercial packages. No warranty can be made or implied that the results are correct. Sample data files (stored as TAB separated values) are available for experimentation. Users that have Excel or other software packages that can export tab, comma or space separated values files can import such files into OpenStat and make comparisons.

Updates are posted from time-to-time to correct known errors, add new procedures or improve user interface for the package. Check this site from time to time to insure that you are using the most current version. Report any problems or errors to the author so that updates can be made to correct the problems. If you are a frequent user of computer software, you are well aware that nearly all software packages have "bugs" or errors of some type that require maintenance or new versions to reduce these problems (e.g. Windows itself!) Send your "bug" reports and suggestions to:

Dr. William G. Miller

3705 NW 2nd Place

Ankeny, Iowa 50023

Or email comments to: OpenStat@msn.com

The following are the links to the OS4 setup files for Windows and the source files should you wish to adapt any of the procedures for your own use. The InstallShield setup file is a .zip files of approximately 5 megabytes. The source file is

approximately 1 megabytes. The INNO setup file is a self-executing zip file of approximately 4 megabytes. The INNO setup does not appear to modify the register and may be preferred by users of networked computers.

OS4 Setup Files for Windows Using InstallShield

OS4 Source C++ Files for Windows

OS4 Sample Data Files

INNO OS4 Setup File

The textbook "Statistics and Measurement Using the free OpenStat Package" is available. It was written using Microsoft Office 2000 and is stored as a .zip file. Click on the link: TEXTBOOK

For a Portable Data File (.pdf) version, click on TextBook.

While a Neural Network sub-system exists in OpenStat4, memory restrictions often can create a problem. For that reason, I have made the Neural Network procedure a separate program which should give the user more adequate space and fewer problems. Use the following link to download the stand-alone version.

NEURAL NETWORK

The source code is downloaded from: NEURAL SOURCE and a PDF file downloaded from NEURAL PDF FILE

If you are a user of the Linux operating system, you will find a similar program (LinOStat) by clicking on the following link:

LinOStat.

Other Linux programs that may be of interest are available from the following links:

GradeBook

ItemBank

MatMan

Another Windows program I find useful for viewing my graphic files is PicView. For a link to this program click on: PICVIEW

Some of you are Visual Basic programmers. If you are interested in a "legacy" version of OpenStat written in Visual Basic version 4 some years ago, you can download the source and setup files of FreeStat. Click on the following links to download the zip files:

FreeStatSrc.zip

FreeStatSetup.zip

EXCELLENT SOURCES FOR FREE STATISTICS

http://www.vipbg.vcu.edu/~mx/mxgui A great matrix manipulation program and structural equations analysis program Mx.

http://www.ghg.net/clips/CLIPS.html Programs for Expert systems.

http://freestatistics.altervista.org/stat.php A source page of other free statistics software.

http://www.angelfire.com/wv/bwhomedir/stats.html A source of on-line books and other statistics software.

http://www.personal.rdg.ac.uk/~snscolet/MScGLMs On-line lectures on the generalized linear model.

http://www.statistics.com/content/freesoft/AZlisting.html Another source of free statistics software.

http://149.170.199.144/multivar/intro.htm#Multivariate An on-line introduction to multivariate statistics.

http://obelia.jde.aca.mmu.ac.uk/multivar/lr.htm On-line lecture on logistic regression.

http://lib.stat.cmu.edu/modules Another source of free statistics software and source code.

http://www.pbarrett.net/statistics_corner.htm#Interrater Articles by Paul Barrett on a variety of statistics.

http://www.personal.psu.edu/users/d/m/dmr/testing/testlinks.htm Dennis Roberts Test/Scale construction links.

http://www.southalabama.edu/coe/bset/johnson/dr_johnson/2textbook.htm Burke Johnson and Larry Christensen book and lectures on statistics concepts.

http://gsociology.icaap.org/methods/soft.html Additional links to statistical software and discussion group on OpenStat.

http://oerl.sri.com A source for project evaluation personnel.

http://pareonline.net/getvn.asp?v=8&n=2 Link to Practical Assessment, Research and Evaluation on-line journal.

http://www.education.umd.edu/EDMS/tutorials/FreeSoftware.html Roberts site for Gummit and related software.

http://statgen.iop.kcl.ac.uk/bgim/mle/sslike_1.html S. Purcell's on-line book on Maximum Liklihood Estimation

http://www.weibull.com/LifeDataWeb/lifedataweb.htm On-line material on Life Data Analysis.

http://www.visualstatistics.net On-line text for visual statistics.

http://forrest.psych.unc.edu/research/index.html Forrest W. Young's ViSta program for visual statistics.

For other sources of free statistics see the excellent page maintained by John Pezzullo at: http://www.statpages.org John has several interactive Java language programs at his site that permit interactive analysis right on the web. For example, he has an excellent program for non-linear regression.

MY FAVORITE FREE SOFTWARE

The following software is exceptional! I encourage you to download and explore their capability.

PAST version 0.45. This is an excellent statistics package and includes multiple multivariate and univariate procedures. I particularly like to choice of the cluster analysis procedures. Go to http://www.uio.no/~ohammer/past for the download.

Khi3 - 1.1.1 . This is a desktop calculator with great features! It includes games, star maps, conversions, and all kinds of calculations. A great package. Go to http://www.1dustrie.com for the download of the free version.

Mxgui32. See the reference link in the above listing of sites. This package has great use for the investigation of causal patterns.

Do you need to convert your music CD's to MP3 files for you listening pleasure while computing? This great little program will read the tracks directly from your CD and convert to MP3 files. You can also convert your older vinyl records! http://www.audiograbber.com-us.net/

PERSONAL NOTE: I have been retired since 1997. I have muscular dystrophy and am also receiving radiation for cancer. While I wish to continue the development of OpenStat, I am finding that my pension is strained with all of my additional costs. While I wish to keep this a free package, I would welcome donations of any size to help sustain my efforts. Anything would be welcome.

Updated: May 7, 2006