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LittleThings Mobile Application

Technical Report



Declaration Cover Sheet for Project Submission

SECTION 1

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- the requirement that a student to attend additional or other lectures or courses or undertake additional academic work.

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Executive Summary

The objective of this project is to produce a mobile application to assist those living with mental health issues through simple lifestyle interventions. The app will be developed with the government campaign 'The Little Things'. This campaign pushes the idea that little things make a big difference when it comes to your mental health. The app will deal with the different areas of 'The Little Things' campaign.

The app will help its users to try and enjoy a healthier lifestyle by attempting to improve their diet, social life and fitness. All these subjects are attributed to mental health problems which the app will try and address.

The app's primary features include a chatroom feature that allows the user to create chatrooms about the different topics revolving around mental and interact with other users about their personal experiences.

A mindfulness feature has been implemented in the app in order to help users in times of stress. Mindfulness has been proven to help people in terms of mental health. There have been three mindfulness tracks added to the app.

- SOS

This is a track that helps the user relax if they're stressing out or having a panic attack.

- Meditation

Mindfulness meditation has been proven to help people that do it once a day to improve their mental health

- Sleep

The sleep track simply helps people that have trouble sleeping to fall asleep with more ease.

A fitness feature has been added to the app to inform people about different fitness plans and also allowing the users to create their own fitness plans.

A mental health quiz was added to the app to help people learn more about mental health in a fun and engaging way.

1 Introduction

The mobile application I am developing is based on the HSE's LittleThings campaign. It is developed with aim to help people who are dealing with mental health issues on a day to day basis.

1.1 Background

The reason for developing this app is to try and develop something that could help people improve their mental health a small step at a time by using the features in the application.

1.2 Aims

The aim is to develop a mobile app with a variety of features and functions that a user can easily use to try improve their everyday lifestyle.

1.3 Technologies

The technologies used will be mainly android based. Android studio will be used as the platform for developing the app. The main languages used will be java and xml. Java will be used for the main development of the different functions and features of the application. XML will be used for design of the app and developing the GUI of the application. I have used Firebase as the database platform for the mobile application.

2 System

2.1 Requirements

2.1.1 Requirement 1 <Fitness>

2.1.1.1 Description & Priority

This requirement will provide information on fitness routines and allow users to create their own.

2.1.1.2 Use Case

The tag for this requirement will be “Fitness”.

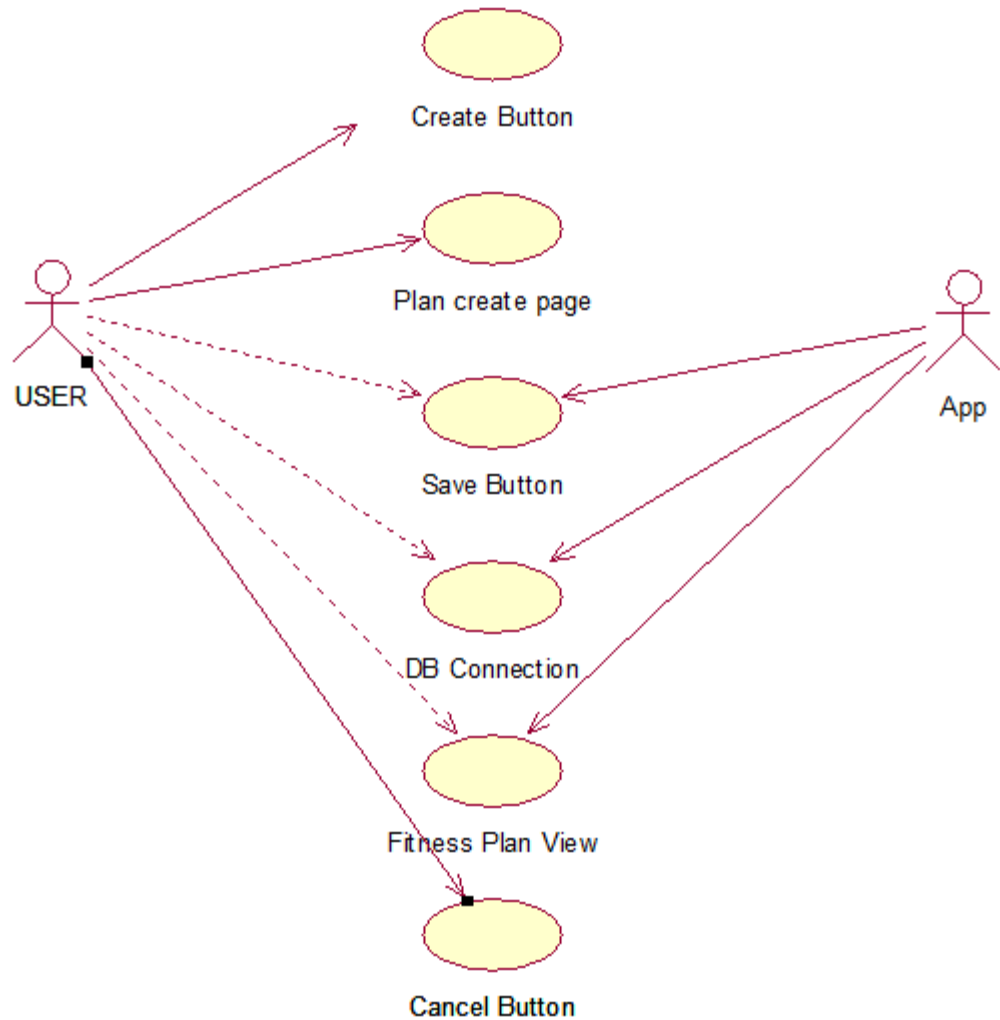
Scope

The scope of this use case is to show how the fitness section of the app will be structured.

Description

This use case describes the how the fitness requirement will work.

Use Case Diagram



Flow Description

Precondition

The system is on the main menu.

Activation

This use case starts when the user selects the fitness button.

Main flow

1. The user selects to create a new fitness plan.
2. The system opens the plan create page.
3. The user enters their new fitness plan and clicks save.
4. The system then sends this information to the database.
5. The system then displays the fitness page.

Alternate flow

A1: User cancels the entry.

1. The system opens the fitness plan entry page.
2. The user cancels the entry.
3. The use case continues at position 9 of the main flow.

Exceptional flow

E1: No Exception flow.

Termination

The System saves the data.

Post condition

The system goes back to the fitness page.

2.1.2 Requirement 2 <Social Aspect>

2.1.2.1 Description & Priority

A description of the requirement and its priority. Describes how essential this requirement is to the overall system.

2.1.2.2 Use Case

The tag for this requirement is "Social".

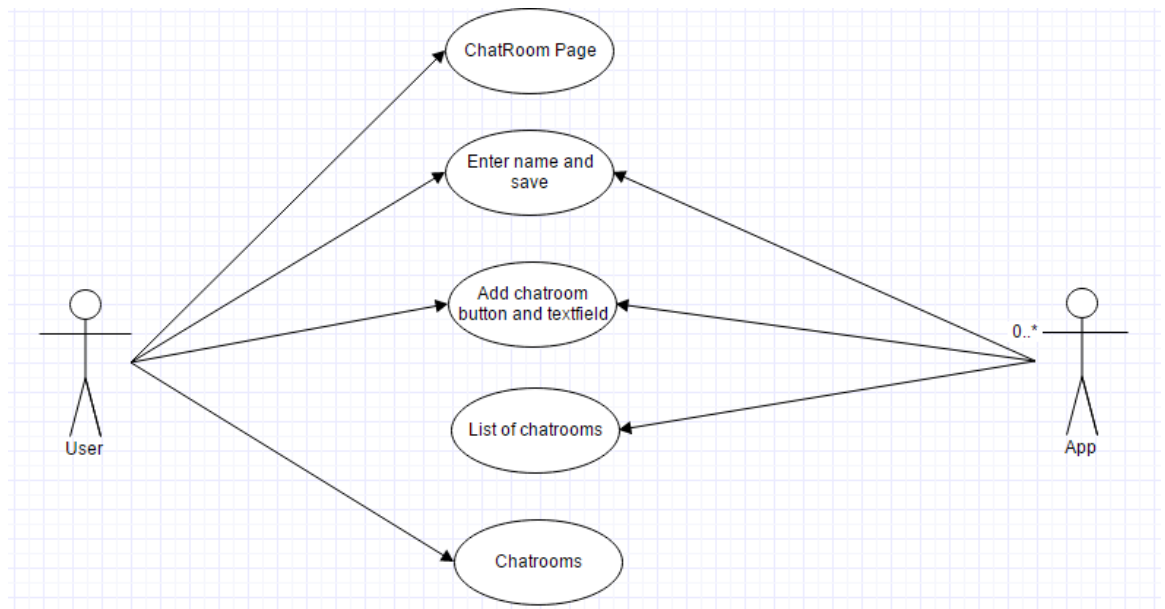
Scope

The scope of this use case is to show the social aspect of the app.

Description

This use case describes how the social aspect of the application works. It is a chatroom feature in the application that allows the users to create chatrooms under different subjects, such as depression. Other users of the app will then interact with each and share experiences and how they dealt with the different aspects of mental health.

Use Case Diagram



Flow Description

Precondition

The system is on the home page

Activation

This use case starts when the user selects the chat room icon.

Main flow

6. The system is on the homepage.
7. The user clicks the chatroom button on the homepage.
8. The system displays the chatroom button.
9. The system displays the enter name text box.
10. The user enters their name.
11. The system saves the name and lands the user on the chatroom page.
12. The user creates a chatroom on a topic of their choice.
13. The system saves this chatroom to the firebase realtime database.
14. The user interacts with other users in the chatroom.

Alternate flow

- A1: The user enters a chatroom not created by them.
4. The user clicks the chatroom button on the homepage.
 5. The system enters the chatroom page and displays the enter name dialog box.
 6. The user enters their name and clicks ok.
 7. The system saves the name entered by the user.

8. The system displays the list of chatrooms.
9. The user selects the chatroom they would like to enter.
10. The system enters that room.
11. The user interacts with other app users.

Exceptional flow

E1: no Exceptional flow.

Termination

The user leaves the chatroom page or closes the app.

Post condition

The user is back on the homepage.

2.1.3 Functional requirements

All functionality in the app should be fully functioning at all times. If this is not the case it may drive users away from the app causing the user base to decline in the future.

2.1.4 Data requirements

The data saved and required by the user must be easily accessed on demand at all times. If data for example, saved by the user in the fitness plan feature is not easily accessible that feature then becomes useless.

2.1.5 User requirements

The HSE's "The Little Things" campaign is built sets out a number of different areas of day to day life that can improve a person's mental health. These areas are the customer requirements that will be implemented in the mobile application. These areas are:

Diet: The application will have a calorie counter that the user can use every day to keep track of their diet. Along with this functionality, information will be provided on

how to improve your diet. This will be provided in the form of easy to make recipes that the user can make at home with little effort.

Fitness: Exercise plans will be provided to the user in two formats. One will be exercises that can be done at home for the users who are not comfortable with going to a gym. The second will be exercise plans for those who want to go to a gym to workout.

These plans will be displayed on a to do list so the user can keep track of what they have done during the week and whether they have hit their goal for that week or not.

Social interaction: The app will allow users to interact with other users via a chatroom feature. This feature will allow the user to create chatrooms about topics to do with mental health or enter chatrooms created by other user about topics they might be interested in.

2.1.6 Environmental requirements

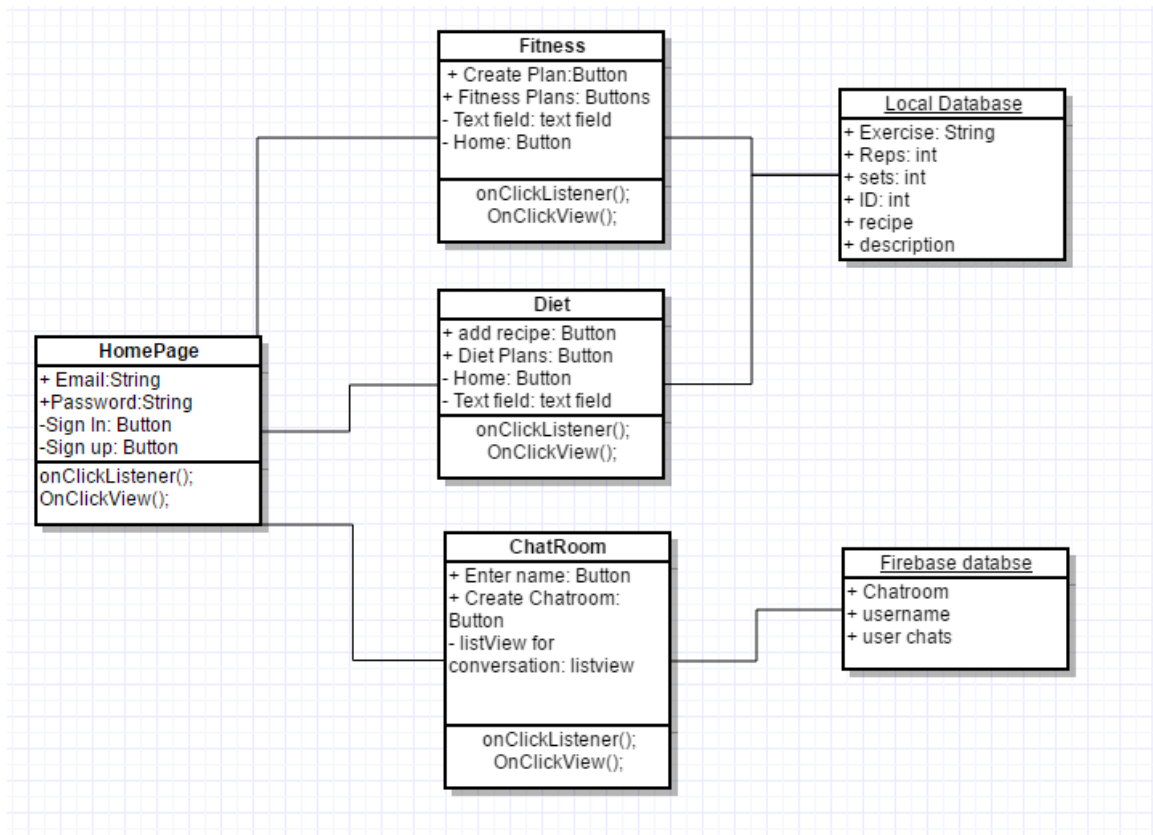
The mobile apps environment should incorporate push and synchronisation capabilities that offer the best way to ensure the user can gain access to information they require when they need it.

2.1.7 Usability requirements

The app has to be easy on the eye while also being simple and straight forward to navigate. The reason for this is that the app may be used by people who are not tech literate and therefore will find something complicatedly structured difficult to use and understand.

2.2 Design and Architecture

Architecture Diagram









2.3 Implementation

The app is broken down into a number of classes each focused on one of the main functionalities of the application. All of these classes will be linked and accessible to the homepage which will be the landing page when the app is opened first.

2.3.1 Authentication

The app uses firebase authentication. The user has to register as a user of the app using their email and a unique password. The table below shows what these users look like inside the database:

Email	Providers	Created	Signed In	User UID ↑
test12@gmail.com		Apr 26, 2017	Apr 26, 2017	2ypwPqPWLWb5s4I2s3IFprpZyr72
test3@gmail.com		Dec 15, 2016	Dec 15, 2016	KDVRgFy22vc3VZMZBcm0ihgncur1
mwhelo@gmail.com		Mar 27, 2017	May 4, 2017	OquyWUZxUZSco7bMSgbiTh7JOc...
test@gamil.com		Dec 14, 2016	Dec 14, 2016	TAziuEd4dEQmlhuyIMb6ic1rdt02
test2@gmail.com		Dec 14, 2016	Dec 15, 2016	ZXD0B10hO1TicDdo7xmmYxC77N...
test1@gmail.com		Dec 14, 2016	Dec 15, 2016	mNtbPNiN4WbdoSTomPWKvbRMk...
<div> Rows per page: 50 ▾ 1-6 of 6 < > </div>				

If the user is already registered the following method will take them directly to the homepage so they don't have to repeatedly login every time they open the app:

```
if(firebaseAuth.getCurrentUser() != null) {
    finish();
    startActivity(new Intent(getApplicationContext(), HomePage.class));
}
```

The method below "registerUser" shows how the application registers a user to the database once they fill in their information and click the register button:


```

private void registerUser(){
    String email = editTextEmail.getText().toString().trim();
    String password = editTextPassword.getText().toString().trim();

    if(TextUtils.isEmpty(email)){
        Toast.makeText(this, "Please enter email", Toast.LENGTH_SHORT).show();
        return;
    }

    if(TextUtils.isEmpty(password)){
        Toast.makeText(this, "Please enter password", Toast.LENGTH_SHORT).show();
        return;
    }

    progressDialog.setMessage("Registering User...");
    progressDialog.show();

    firebaseAuth.createUserWithEmailAndPassword(email, password)
        .addOnCompleteListener(this, new OnCompleteListener<AuthResult>(){
            @Override
            public void onComplete(@NonNull Task<AuthResult> task){
                if(task.isSuccessful()){
                    finish();
                    startActivity(new Intent(getApplicationContext(), HomePage.class));
                }
                else{
                    Toast.makeText(RegisterPage.this, "Could not Registered, Please try again", Toast.LENGTH_SHORT).show();
                }
                progressDialog.hide();
            }
        });
}
}

```

In the login.java class the following method shows how the app checks the users credentials and logs them in if the details entered are correct:

```

private void userLogin(){
    String email = editTextEmail.getText().toString().trim();
    String password = editTextPassword.getText().toString().trim();

    if(TextUtils.isEmpty(email)){
        Toast.makeText(this, "Please enter email", Toast.LENGTH_SHORT).show();
        return;
    }

    if(TextUtils.isEmpty(password)){
        Toast.makeText(this, "Please enter password", Toast.LENGTH_SHORT).show();
        return;
    }

    progressDialog.setMessage("Logging In, Please wait...");
    progressDialog.show();

    firebaseAuth.signInWithEmailAndPassword(email, password)
        .addOnCompleteListener(this, (task) → {
            progressDialog.dismiss();

            if(task.isSuccessful()){
                finish();
                startActivity(new Intent(getApplicationContext(), HomePage.class));
            }

        });
}

```

2.3.2 Fitness function

The fitness function will allow users to access readily available fitness plans and routines as well as create their own. This will help users to choose what works for them best. The user can choose exercises from the available routines and put together their own which will be saved to a local database so they can be accessed any time they need them.

The app uses a local database to allow the user to create their own fitness plans. The DatabaseHelper.java class creates and controls the local database. The strings below create the database, db table and db columns of the database:

```

public static final String DATABASE_NAME = "ExerciseRoutine.db";
public static final String TABLE_NAME = "Exercise_table";
public static final String COL_1 = "ID";
public static final String COL_2 = "Exercise";
public static final String COL_3 = "Reps";
public static final String COL_4 = "Sets";

```

The method below creates the database table and adds columns to it:

```

@Override
public void onCreate(SQLiteDatabase db) {
    db.execSQL("create table " + TABLE_NAME + "(ID INTEGER PRIMARY KEY AUTOINCREMENT, Exercise TEXT, Reps INTEGER, Sets INTEGER) ");
}

```

The two methods below show how the code allows the user to delete different exercises they've added and to drop a table if it already exists:

```

public Integer deleteExercise(String id){
    SQLiteDatabase db = this.getWritableDatabase();
    return db.delete(TABLE_NAME, "ID = ?", new String[]{id});
}

@Override
public void onUpgrade(SQLiteDatabase db, int oldVersion, int newVersion) {
    db.execSQL("DROP TABLE IF EXISTS "+TABLE_NAME);
    onCreate(db);
}

```

The three methods below allow the user to insert data into the table when they click the save button. The second method returns the plan once the user clicks the view plan button and the final method updates the db table in order to update different exercises:

```

public boolean insertData(String exercise, String reps, String sets){
    SQLiteDatabase db = this.getWritableDatabase();
    ContentValues contentValues = new ContentValues();
    contentValues.put(COL_2, exercise);
    contentValues.put(COL_3, reps);
    contentValues.put(COL_4, sets);
    long result = db.insert(TABLE_NAME, null, contentValues);
    if(result == -1)
        return false;
    else
        return true;
}

public Cursor getPlan(){
    SQLiteDatabase db = this.getWritableDatabase();
    Cursor res = db.rawQuery("select * from " + TABLE_NAME, null);
    return res;
}

public boolean updatePlan(String id, String exercise, String reps, String sets ){
    SQLiteDatabase db = this.getWritableDatabase();
    ContentValues contentValues = new ContentValues();

    contentValues.put(COL_1, id);
    contentValues.put(COL_2, exercise);
    contentValues.put(COL_3, reps);
    contentValues.put(COL_4, sets);

    db.update(TABLE_NAME, contentValues, "id = ?", new String[]{id});

    return true;
}

```

2.3.3 Chat Function

The social function will allow users to interact with other users via a chatroom feature. This feature will allow the user to create chatrooms about topics to do with mental health or enter chatrooms created by other user about topics they might be interested in.

The chatroom functionality is Google firebase based in terms of where the chat information is stored. The chatroom uses google firebase real time database to allow users to interact in real time.

The code below tells the db to add the chatroom name to the root of the database:

```
private DatabaseReference root = FirebaseDatabase.getInstance().getReference().getRoot();
```

The on click listener screenshotted below shows what happens when the user clicks the add chatroom button. The information the user enters about the name of the chatroom being created is added to the root of the db using the “root.updateChildren(map);” line of code:

```
add_chat.setOnClickListener(new View.OnClickListener() {  
    @Override  
    public void onClick(View view) {  
  
        Map<String, Object> map = new HashMap<>();  
        map.put(chat_name.getText().toString(), "");  
        root.updateChildren(map);  
  
    }  
});
```

The code below makes sure that no two chatrooms have the same name:

```
root.addValueEventListener(new ValueEventListener() {  
    @Override  
    public void onDataChange(DataSnapshot dataSnapshot) {  
        Set<String> set = new HashSet<>();  
        Iterator i = dataSnapshot.getChildren().iterator();  
  
        while(i.hasNext()) {  
            set.add(((DataSnapshot)i.next()).getKey());  
        }  
        list_of_chats.clear();  
        list_of_chats.addAll(set);  
  
        arrayAdapter.notifyDataSetChanged();  
    }  
});
```

When the user enters the chatroom page of the app they’re met with an alertDialog that asks them to enter a name they want to use for that instance of using the chat. This alertDialog code is shown below:

```

private void request_user_name() {
    AlertDialog.Builder builder = new AlertDialog.Builder(this);
    builder.setTitle("Enter Your Name");

    final EditText input_field = new EditText(this);

    builder.setView(input_field);
    builder.setPositiveButton("OK", new DialogInterface.OnClickListener() {
        @Override
        public void onClick(DialogInterface dialogInterface, int i) {
            name = input_field.getText().toString();
        }
    });

    builder.setNegativeButton("Cancel", new DialogInterface.OnClickListener() {
        @Override
        public void onClick(DialogInterface dialogInterface, int i) {
            dialogInterface.cancel();
            request_user_name();
        }
    });

    builder.show();
}

```

Once the user enters a chatroom they can interact with other users. This works in terms of the database by the following line of code finding out what the name of the chatroom is:

```

root = FirebaseDatabase.getInstance().getReference().child(chat_name);

```

The following method allows the user to interact with others by sending information to inside the "chat_name" node of the database:

```

send_btn.setOnClickListener(new View.OnClickListener() {
    @Override
    public void onClick(View view) {
        Map<String, Object> map = new HashMap<>();
        temp_key = root.push().getKey();
        root.updateChildren(map);

        DatabaseReference message_root = root.child(temp_key);
        Map<String, Object> map2 = new HashMap<>();
        map2.put("name", user_name);
        map2.put("msg", input_msg.getText().toString());

        message_root.updateChildren(map2);
    }
});

```

2.3.4 Quiz Function

The idea behind the quiz functionality is to try to inform the users about the issues revolving mental health. This task was assigned to me by a student support employee in the NCI student learning centre. She proposed that a feature that the user could interact with and learn about mental health. The quiz function is what I came up with to add functionality to this idea.

The code below shows the array of strings that hold the questions and answers for the quiz:

```

public String mQuestions[] = {
    "How many people will experience some kind of mental health problem in the course of a year?",
    "What is the most common mental health disorder in Britain?",
    "What percentage of children have a mental health problem at any given time?",
    "How many people does depression affect?",
    "Who is most likely to die from committing suicide?",
    "How many prisoners have a mental disorder?",
    "How many people worldwide are estimated to have a mental health problem?",
    "What are not physical symptoms of depression?",
    "How many people are affected by an eating disorder in the uk?",
    "What is the female to male ratio of Obsessive Compulsive Disorder"
};

private String mChoices[][] = {
    {"1 in 4", "1 in 10", "1 in 6", "1 in 3"},
    {"Eating Disorders", "Schizophrenia", "Depression", "Epilepsy"},
    {"15%", "10%", "5%", "20%"},
    {"1 in 5", "1 in 3", "1 in 10", "1 in 12"},
    {"Men", "Women", " ", " "},
    {"1 in 2", "1 in 5", "9 in 10", "1 in 3"},
    {"300 million", "450 million", "100 million", "550 million"},
    {"Sleeping for longer", "Lessened sex drive", "Constipation", "Loss of appetite"},
    {"0.5 million", "1.7 million", "0.9 million", "1.1 million"},
    {"10:7", "15:9", "7:10", "9:15"}
};

```

The correct answers are pulled from the mCorrectAnswers array:

```

private String mCorrectAnswers[] = {"1 in 4", "Depression", "10%", "1 in 5", "Men", "9 in 10", "450 million", "Sleeping for longer", "1.1 million", "15:9"};

```

Once the questions, answers and correct answers were established getters were implemented so the arrays could be pulled by another java class:


```

public String getQuestion(int a){
    String question = mQuestions[a];
    return question;
}

public String getChoice1(int a){
    String choice = mChoices[a][0];
    return choice;
}

public String getChoice2(int a){
    String choice = mChoices[a][1];
    return choice;
}

public String getChoice3(int a){
    String choice = mChoices[a][2];
    return choice;
}

public String getChoice4(int a){
    String choice = mChoices[a][3];
    return choice;
}

public String getCorrectAnswer(int a){
    String answer = mCorrectAnswers[a];
    return answer;
}

```

The QuizMainActivity.java class controls the functional part of the quiz function. Four on click listeners were added to control four different buttons. These buttons were added to allow the user to answer the questions put forward to her. An example of one of these on click listeners is shown below:

```

answer1.setOnClickListener(new View.OnClickListener() {
    @Override
    public void onClick(View view) {

        if(answer1.getText() == mAnswer){
            mScore++;
            score.setText("Score: " + mScore);
            updateQuestion(r.nextInt(mQuestionslenght));
        } else{
            gameOver();
        }
    }
});

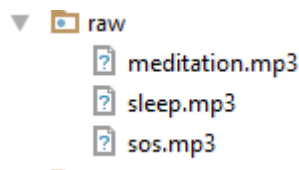
```

2.3.5 Mindfulness Function

Mindfulness refers to a depth of awareness that is at the very core of our being and the practice of mindfulness supports us in nourishing and cultivating this simple awareness. Introducing mindfulness into daily life supports us in living life with a sense of contentment and clarity, it nourishes the body, mind and emotions.

Mindfulness has been proven to improve the mental health of the people who use it. With this in mind I thought it would be helpful to users of the app to include three different types of mindfulness meditation. These three types are SOS, a 10-minute meditation and sleep meditation.

The three audio files are stored locally on the device in the raw folder as shown below:



The code below shows the on click listeners set up to play, pause and stop the SOS audio file. The code also shows how the seekbar tracks the progress of the audio file:

```

private void setupListeners1() {
    startButton.setOnClickListener(new View.OnClickListener() {
        @Override
        public void onClick(View v) {
            soundPlayer.start();
        }
    });

    pauseButton.setOnClickListener(new View.OnClickListener() {
        @Override
        public void onClick(View v) {
            soundPlayer.pause();
        }
    });

    stopButton.setOnClickListener(new View.OnClickListener() {
        @Override
        public void onClick(View cuttentView) {
            soundPlayer.stop();
            soundPlayer = MediaPlayer.create(getBaseContext(), R.raw.sos);
        }
    });

    soundSeekBar.setOnSeekBarChangeListener(new SeekBar.OnSeekBarChangeListener() {
        @Override
        public void onStopTrackingTouch(SeekBar seekBar) {

        }

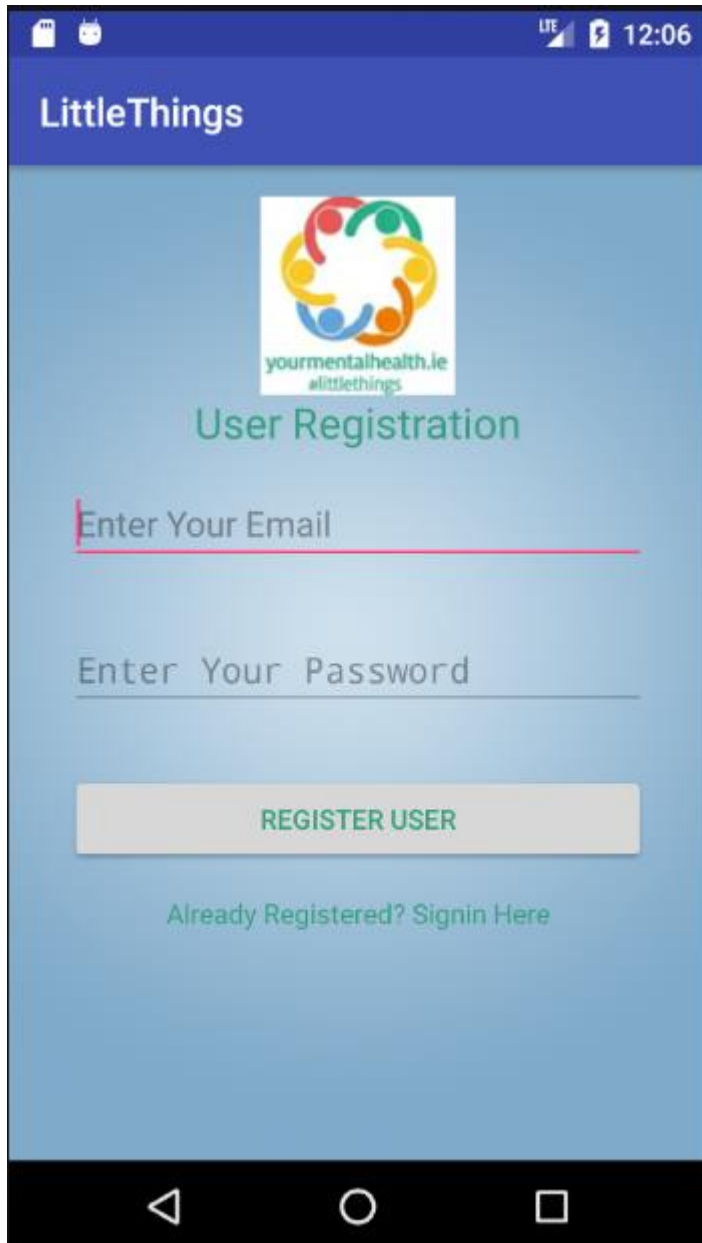
        @Override
        public void onStartTrackingTouch(SeekBar seekBar) {

        }

        @Override
        public void onProgressChanged(SeekBar seekBar, int progress, boolean fromUser) {
            if (fromUser) {
                soundPlayer.seekTo(progress);
            }
        }
    });
}

```


2.4 Graphical User Interface (GUI) Layout



The screenshot displays the 'LittleThings' mobile application interface for user registration. At the top, a blue header bar contains the app's name 'LittleThings'. Below this, a logo for 'yourmentalhealth.ie #littletthings' is centered, featuring a circular arrangement of colorful human figures. The title 'User Registration' is prominently displayed in green text. The form includes two input fields: 'Enter Your Email' with a pink underline and 'Enter Your Password' with a grey underline. A grey button labeled 'REGISTER USER' in green text is positioned below the password field. At the bottom of the form, a green link reads 'Already Registered? Signin Here'. The interface is framed by a black Android-style status bar at the top (showing LTE, battery, and 12:06) and a black navigation bar at the bottom (with back, home, and recent apps icons).

LTE 12:05

LittleThings



yourmentalhealth.ie
@littethings

User Login

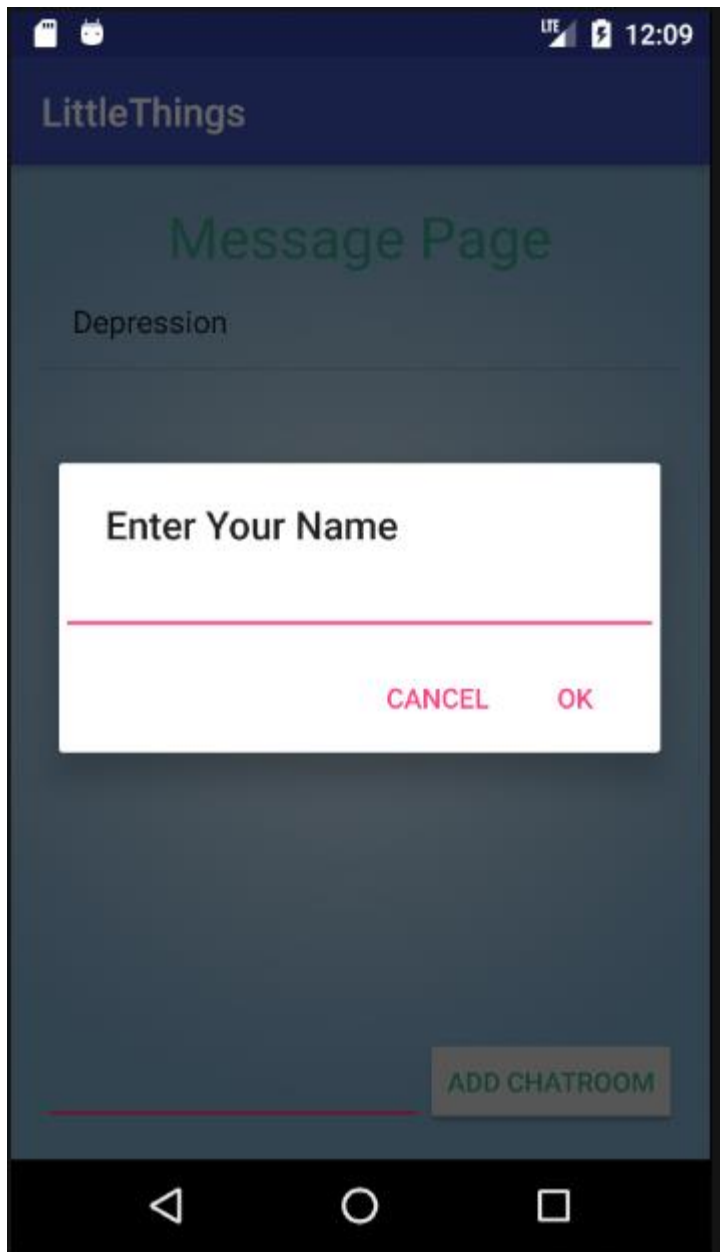
Enter Your Email

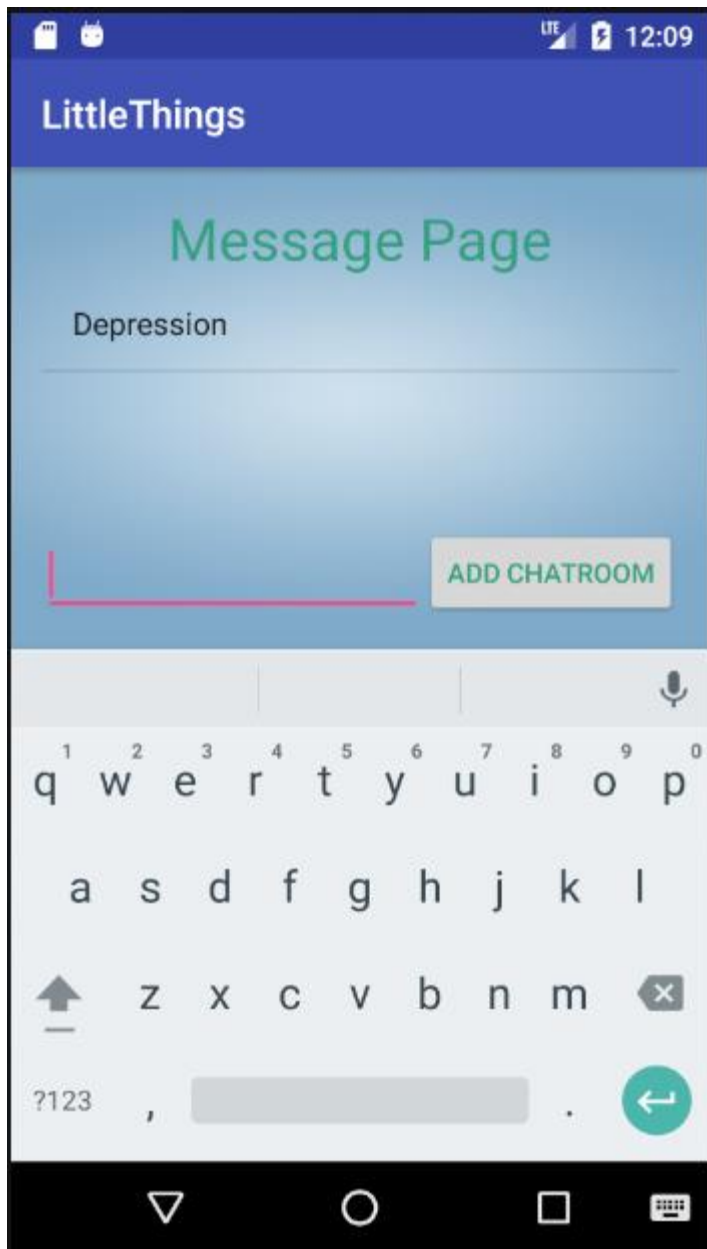
Enter Your Password

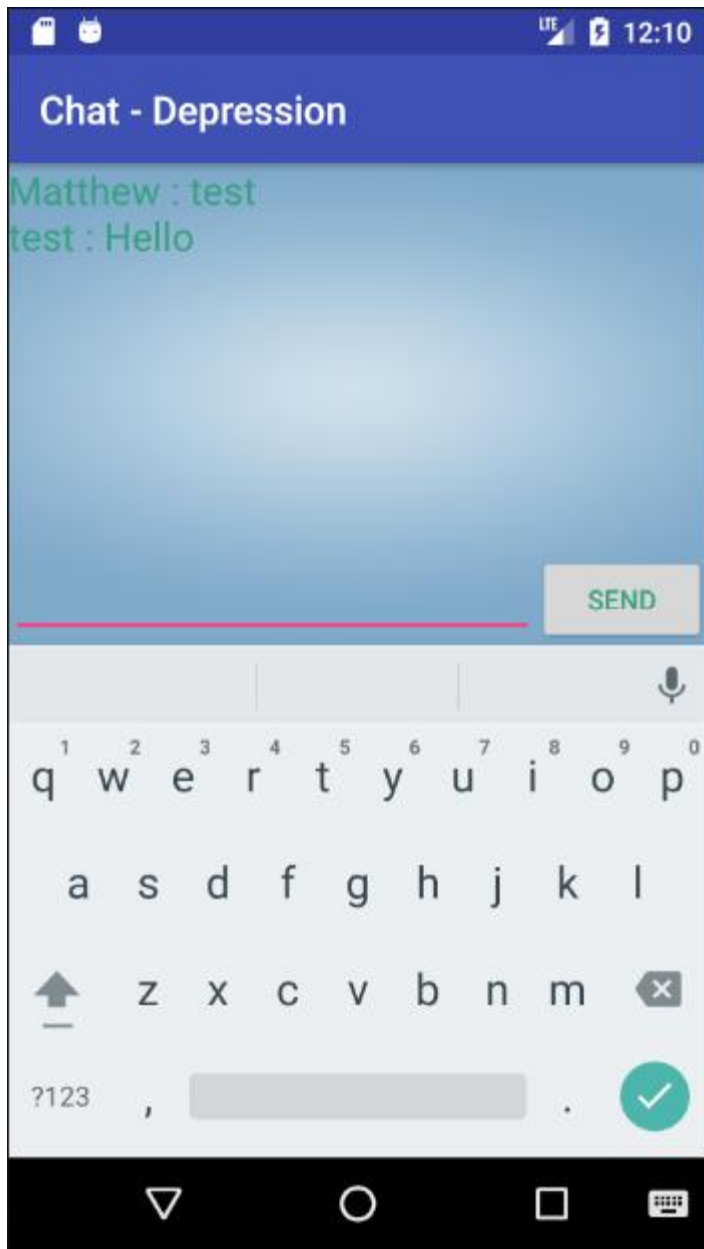
SIGNIN

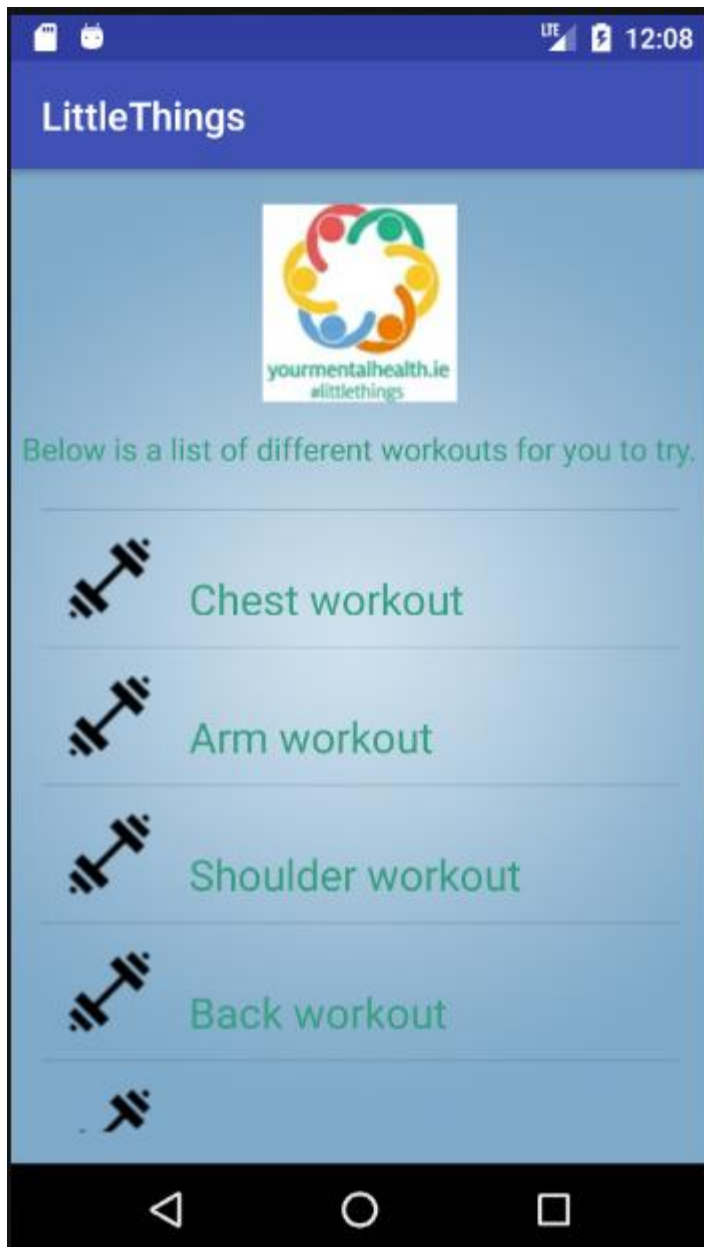
No Account? Register Here











LTE 12:09

LittleThings

Exercise

Reps

Sets

ID

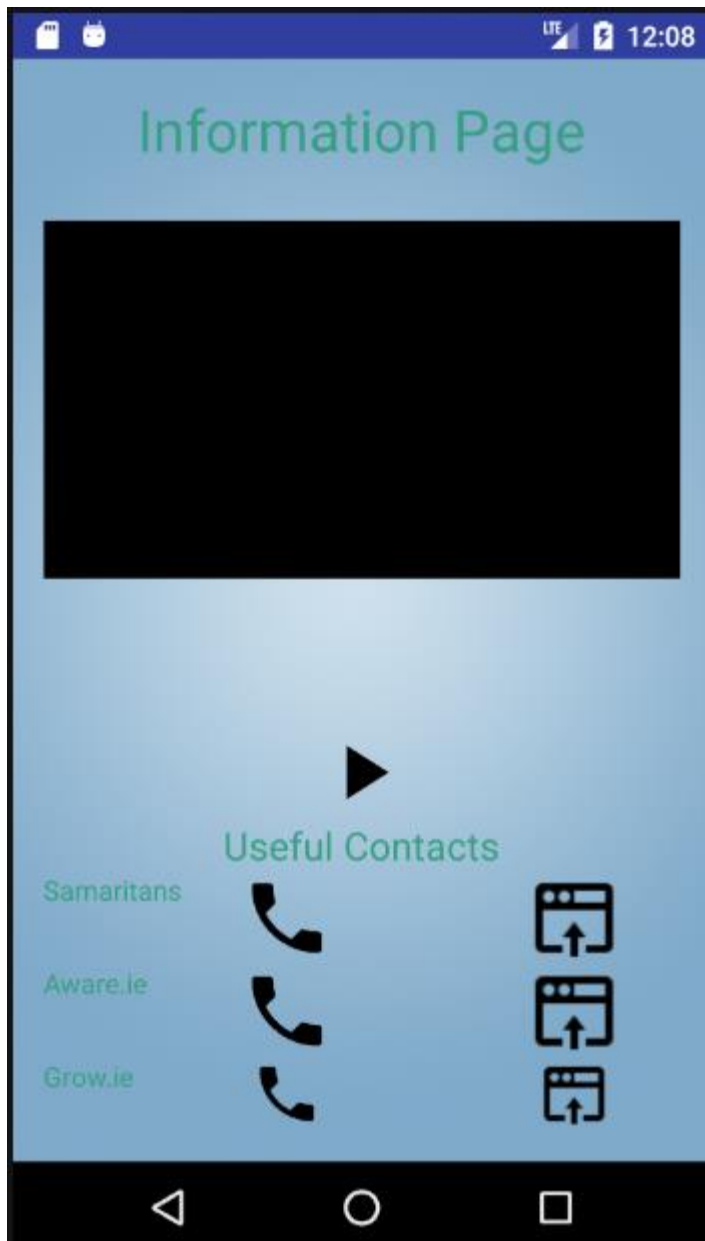
SAVE

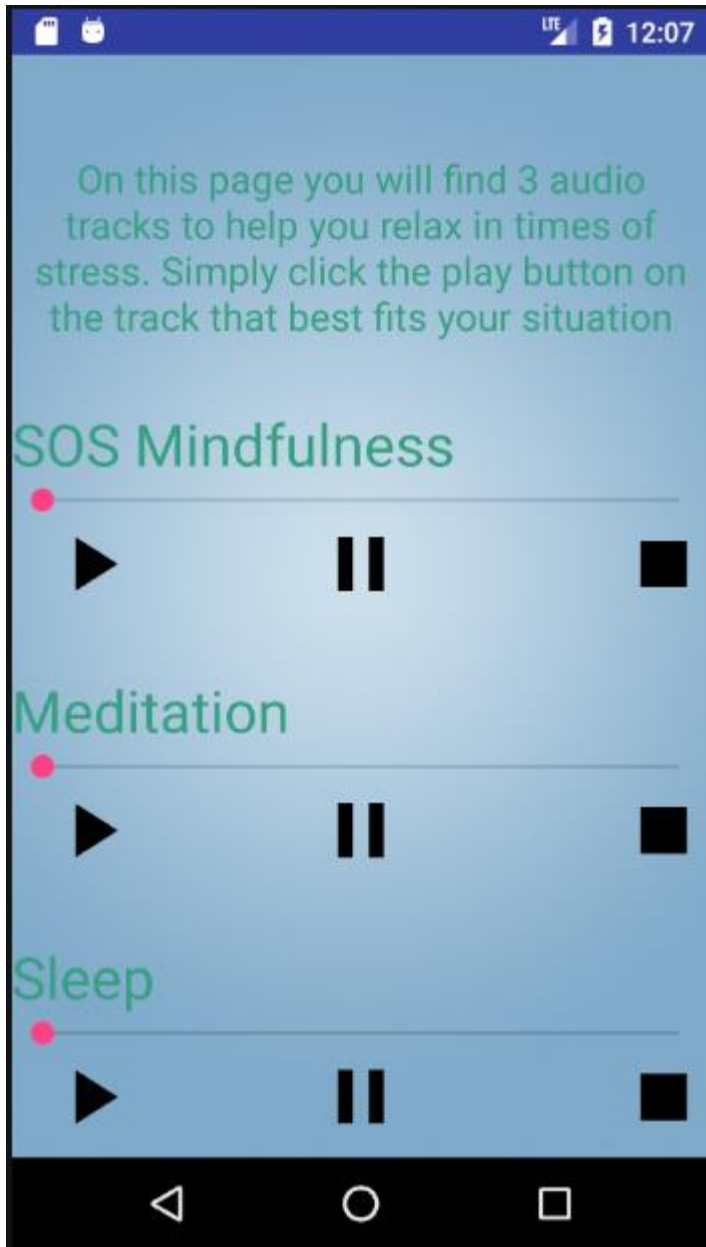
VIEW ROUTINE

DELETE EXERCISE

UPDATE ROUTINE

Enter the Exercises you want to add to your Plan





2.5 Testing

2.5.1 Unit Testing

Throughout the develop of each function, I carried out unit testing on each of the functions. This involves running the app on both my android phone and an emulator on my pc and monitoring the “Android Monitor” view in android studio. This view returns any errors that are in the code while the app is running. This was a very effective way of finding errors in the code in order to fix them.

2.5.2 Persona Testing

To test my application on the broadest scale possible, I created 3 personas for people that will use the app.

- College student: Aaron is a 22 year old college student studying business in Dublin city centre. He owns an android smart phone and thought the layout of the app was easy to learn and efficient when an icon was clicked. He really enjoyed the chatroom aspect of the app.
- Business owner: Gerry is a 45 year old man who owns his own landscaping business. He owns an android mobile smart phone. He thought the app was simple and easy to use. He enjoyed the fact that the information page had direct links to helpful websites and phone numbers opened the phone application on his phone when clicked.
- Retired: Mary is 68 year old woman and has been retired for 2 years. She doesn't own a smart phone. For someone who doesn't own a smart phone, Mary had no problems navigating the app and using the different features of the application.

2.5.3 Scenario Testing

Scenario 1

- The user was tasked with starting the app.
- Registering as a user.
- Entering the chatroom app.
- Creating a chatroom

User 1

Aaron

Task analysis

The user was able to complete this test without too much trouble. The feedback from the user was that he found it easy to find the chatroom feature and create a chatroom to start interacting with other users.

Scenario 2

- The user was tasked with starting the app.
- Registering as a user.
- Entering the fitness page.
- Entering some test exercises to the database.

User 2

Gerry

Task analysis

The user completed the test, although he had to ask about where to click on the login screen to register a new user. His reason for this was not knowing that the test view was able to be clickable and was expecting a button.

Scenario 3

- The user was tasked with starting the app.
- Registering as a user.
- Enter the information page.
- Simply find out how to ring one of the direct numbers on the info page.

User 2

Mary

Task analysis

The user completed the task after taking a little bit of time to get through the registration process.

2.5.4 Backwards Compatibility Test

The app was mainly testing on android SDK version 25 due to the fact it was developed on this platform. However, the app was always tested on an android phone that had SDK 23 installed on it as well as being tested on a simulator using SDK 21. The app passed all tests ran on the different versions of android SDK mentioned above.

2.6 Evaluation

I will frequently be able to evaluate the system and test how the app is running. In Android Studio I will be able to run the app on its built-in simulators to make sure the app itself is running fine. I will be able to test the database by entering information into the app or registering users and monitoring the database tables updating in real time on the firebase dashboard. Once the app is completely finished I will be able to publish the app on the google play store and monitor user activity to make sure the app runs just as smooth with a larger user base.

3 Conclusions

3.1 Advantages

The advantages of this app is that it is being developed with a view to helping people who need it. This can make a difference for people struggling on a day to day basis with mental health issues. It can also create awareness for the Little Things campaign as many people with mental health issues may not know how the simple things of everyday life can make a huge difference when it comes to mental health problems such as depression and anxiety.

The chatroom function of the app allows user to chat and share information anonymously with each. This is an advantage of the app as people tend to not want to talk about their mental health problems in public. This function gives them a safe place to share their experiences.

3.2 Disadvantages

The disadvantages of developing this app are the limited target audience that it will target and the lack of opportunities that will come out of it. There is no real financial gain to be made from developing this app as it will be free to use as an aid for people that need it.

3.3 Opportunities and Limits

The opportunities involved in developing this app are that it may be endorsed and released by the HSE as part of their LittleThings campaign. If this happened hopefully the app would be able to help people deal and improve their mental health.

The next step in the development of the app would to release it on the google play store wit google ads sense added. This would be an opportunity to make money

from the app as well as monitor how well the app handles a larger amount of traffic through the system.

The limits to the project are its small target market and their being little chance of any profit being made off it. There is little to no chance that the HSE would charge people to download the app if released by them.

4 Further development or research

With more resources and time the app could develop into something bigger by having more features and functions added. With feedback from users the app can be changed to meet their needs. The project could develop into something that can really help the people who need it with enough time and effort being put into it. Hopefully in the future more attention can put towards developing into app that can make a difference to those living with mental health problems.

5 References

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<https://www.udacity.com/course/android-development-for-beginners--ud837>

<https://developer.android.com/training/basics/firstapp/index.html>

<https://firebase.google.com/docs/>

<http://www.yourmentalhealth.ie/>

<https://material.io/icons/>

6 Appendix

6.1 Project Proposal

Mental Health Mobile App

Matthew Whelan x12431142 matthew.whelan@student.ncirl.ie

BSc (Hons) in Computing

Specialisation: Mobile Technologies

20/10/2016

1. Objectives

The objective of this project is to produce a mobile application to assist those living with mental health issues through simple lifestyle interventions. The will be developed with the government campaign 'The Little Things'. This campaign pushes the idea that little things make a big difference when it comes to your mental health. The app will deal with the different areas of 'The Little Things' campaign.

The app will help its users to try and enjoy a healthier lifestyle by attempting to improve their diet, sleep schedule, social life and to drink less. All these subjects are attributed to mental health problems which the app will try and address.

Fitness is key factor in enjoying a healthy lifestyle and the app will assist its users by promoting easy to do home fitness routines, encouraging users to leave the

house to go for a walk/run and by allowing users to set goals for themselves to achieve. The feeling of completing a goal you set for yourself gives you the feeling of accomplishment even if it's something as small as going for a walk a couple of times a week.

Diet is another area focused on by "The Little Things" campaign, the app will help users try and improve their diets through a number of different features. The app will include a calorie counter which users can set goals against in order to stay under the set amount each day. Keeping track of what you eat allows you to see where you are going wrong in terms of your diet. This app will allow users to improve their eating patterns by tracking their daily eating routine.

Your social life can hugely effect your mental health and by doing things in a group you can feel a sense of worth within that group. The app will allow you to share your fitness and diet progress with others so you may interact with other people in similar situations to yourself. Getting positive feedback from your peers can give you a major boost in confidence which is what this feature aims to achieve.

1. Background

The reason I chose to take on this project was that I know a number of people who have had mental health issues in the past and would like to try create something to help. I also have family members that work within the HSE and have heard a lot about "The Little Things" campaign and how it helping people deal with their problems a small step at a time.

I also have an interest in mobile app development and hope that by developing this android app alone, it will give me a skill set that I can use once in the real world.

“The Little Things” campaign focus’ on a number of different areas linked with mental health problems with each of these areas having their own slogan attached. These are:

- Sleep: “8 hours sleep make the other 16 easier”
- Diet: “Boost your mood with healthy food”
- Drinking: “Drink less and great nights become good mornings”
- Fitness: “The more you move the better your mood”
- Social: “Problems feel smaller when you share them”

Each of the areas focused on by the campaign might seem easier to do to most people but to a lot of people living with depression getting the motivation to try tackles these problems in their life can be difficult. That’s where I hope this app can help, by getting users to improve on a small number of things they can improve their overall life on a number of levels.

1. Technical Approach

The first objective will be to gather information on the areas which the campaign focus’ on and design a wireframe of what the mobile applications UI will look like. The goals of this UI will to make it easy to use and attractive as possible for the users.

Once the UI is designed the next phase of the project can begin, this being developing the mobile app using Android Studio. This I hope to have finished before the new year so the half of the college year can be focused on the functionality I plan to implement in the app. The knowledge gained from the Mobile Development modules in college along with personal research will help with the UI development.

After the UI is development as stated above this should be completed by January. Work will then start on the apps functionality.

This will include:

- The Database implementation
- Fitness features (routines, user motivation etc..)
- Diet features (Diet tracking, sharing, calorie counter etc..)
- Sleep features (Sleep schedule tracking etc...)
- Social features

Once all functionality has been developed, the next stage of the process will be to test the application. This will be done in a couple of different ways.

Internal testing: This will be done by myself by making sure all features implemented are working as they should before the end user testing can begin.

End user testing: For this stage of testing I plan to get help from a number of different people with various technical ability. For example: Class mates, friends, family and work mates from my 3rd year internship.

1. Special resources required

All source material will be taken from the website set up by the HSE for “The Little Things” campaign. There is a huge amount of information on the subject on this website which will guide the direction in which the app is developed.

<http://www.yourmentalhealth.ie/Get-involved/LittleThings-campaign>

1. Project Plan

Task Mode	Task Name	Duration	Start	Finish	Predecessors	Resource Names
Manually Scheduled	Research into Project information	9 days	Wed 19/10/16	Mon 31/10/16		

Manually Scheduled	UI Design and Development	45 days	Tue 01/11/16	Sun 01/01/17		
Manually Scheduled	Prototype Due	1 day	Fri 02/12/16	Fri 02/12/16		
Manually Scheduled	Mid Point Presentation	2 days	Fri 16/12/16	Sat 17/12/16		
Manually Scheduled	Requirements Specification Upload Date	1 day	Fri 11/11/16	Fri 11/11/16		
Manually Scheduled	Fitness Functionality	23 days	Sun 01/01/17	Tue 31/01/17		
Manually Scheduled	Diet Functionality	20 days	Wed 01/02/17	Tue 28/02/17		
Manually Scheduled	Sleep Functionality	23 days	Wed 01/03/17	Fri 31/03/17		
Manually Scheduled	Showcase Materials	1 day	Mon 17/04/17	Mon 17/04/17		

Manually Schedule d	Testing and Fixing	22 days	Sat 01/04/1 7	Sun 30/04/1 7		
Manually Schedule d	Final Changes to the project code	13 days	Mon 01/05/1 7	Wed 17/05/1 7		
Manually Schedule d	Upload Date	1 day	Wed 17/05/1 7	Wed 17/05/1 7		

1. Technical Details

The mobile application will be developed using Android studio for the purpose of using the app on android mobile devices.

The languages used to develop the app in Android Studio will be:

- Java
- Java script
- HTML
- XML
- SQL

The database used to store information will be a SQLite Database. From research online this type of database seems to be the most compatible and popular.

1. Evaluation

The mobile application will be tested in a number of different ways both internally and externally.

I personally have nine months' experience as a QA Engineer Intern from a placement I completed last year. I will run my own internal testing using test user and data from the HSE website.

External testing or end user testing will be done by people I can agree to help in the process such as class mate, friends and work colleagues from my internship. Their feedback will be taken into consideration before the final build and uploading of the application.

Matthew Whelan 20th/10/2016

Signature of student and date

6.2 *Monthly Journals*

4th Year Reflective Journal

Matthew Whelan – x12431142

Introduction:

My name is Matthew Whelan and I am a 4th year computing student at NCI. This journal will be comprised of my thoughts and progress in regards to my 4th year project throughout the year. Hopefully maintaining a journal just like this will keep me focused on my project.

September:

With this being the first month of the college year the majority of it was spent trying to come up with and research various ideas for my 4th year project. A number of variables came into consideration when trying to decide on what to put forward for review for my 4th year project. The knowledge and skill needed to develop certain ideas that I came up with. After research on various ideas some were too simply and could be completed in a number of days, whereas others were too complex

and I wasn't confident in my own ability to complete these apps. Maybe these ideas can be revisited once I hopefully graduate either as personal projects or in the hope they may be profitable in the future.

In conclusion the month of September was a month of idea generation and research on these ideas while trying to decide which idea is best suited to put forward to get through the review.

October:

At the start of October was the project proposals, I went into the proposal with a very vague and non-complex idea. This was reflected in the responses from the lectures judging the proposals. The feedback I got was that the project as I thought was not complex enough and the idea did not get through the judging process. The idea was for an app that allowed you to select different options in regards to building a custom PC. The app then returned a list of the optimum components to build this pc. The lecturers thought along with this already existing to some format that it would not be enough to pass the 4th year project module.

After the proposal panic set in because I did not know what I was doing for the rest of the year. A week after the proposals a list was published on the project module page with a number of projects put forward by the lecturers for students who had their project ideas rejected to choose from. After reading through the list of proposals, I selected a project to do with the subject of mental health and the HSE's "The Little Things" campaign. The proposal laid out a description of a mobile application that helped users with mental health issues in a number of different areas.

"The Little Things" campaign focus' on a number of different areas linked with mental health problems with each of these areas having their own slogan attached. These are:

- Sleep: "8 hours sleep make the other 16 easier"
- Diet: "Boost your mood with healthy food"

- Drinking: “Drink less and great nights become good mornings”
- Fitness: “The more you move the better your mood”
- Social: “Problems feel smaller when you share them”

Once I got the all clear from the lecturer that put forward the project to proceed with it, I started writing up the project proposal. The project proposal was due on Friday the 21st of October. Once uploaded I could start trying to get my head around where to start developing the project. The aim before the midpoint presentation is to have the UI of the app developed to have something to show during this presentation. The month of November will be focused on developing this UI hand in hand with writing the requirement specification for the project which is due on Friday the 11th of November.

November:

After the requirement specification was finished and submitted it was time to start working on the development of the actual app. During the month of November, I started researching and developing some of UI for the application. I started by drawing the layout to the homepage on paper to give myself an idea of what it should look like while I was coding it. The Homepage is basic enough and contains information about what the app does then provides buttons to each of the functional parts of the app.

I incorporated the YouTube API into the app in order to playback some of the HSE’s campaign videos and ads they have released throughout the campaign cycle. To do this I first had to acquire a API from Google to be able to access the API library which was downloaded from <https://developers.google.com/youtube/android/player/downloads/>. I then had to create an activity and xml layout to display the video. Through researching online about how to do this I then set about coding the new activity. This was a small step

in the right direction in terms of finishing the project but there was still a long way to go.

I then revisited the project a few days later as I had to finish other projects for college with a view to start developing another one of the apps activities. The one I chose to start on was the sleeping function of the app. The idea behind this function is to provide the user with some form of alarm that they can set to remind them to go to sleep at a certain time. One of the things highlighted in the Little Things campaign is that sleep can be a major factor in terms of your mental health. So the aim of this function is to improve the users sleep schedule.

The function itself allows the user to set the time they want to sleep at. An alarm will go off at the set time to remind them that they should try sleep. The app implements the TimePicker function in android studio. The alarm runs in the background even if the app is closed so the user can go about using their phone for other things or not use it at all and the alarm will still go off at the set time. This function is currently still being developed and I hope to finish it in the next couple of days.

The objective for the first half of the month of December with regards to the project is to finish off the alarm function and also to start and finish or at least start one more function of the app. I also have to create a PowerPoint presentation for the mid-point presentations coming on either the 19th or 20th of December. The aim for this presentation is to have a working prototype to show the examiners to try and achieve the highest mark possible for this section of the project. Hopefully the examiners can provide some helpful feedback on the project to push me in the right direction towards completing the project in the best possible way in terms of achieving a high grade.

December:

The month of December was probably the busiest month of the year so far in terms of deadlines. Apart from the project itself I had four projects due around the last

week of the semester. As well as these deadlines, we had our mid-point project presentations.

The requirements for this presentation were to have a PowerPoint presentation along with a prototype of the mobile application I was working on. The week leading up to this presentation was mainly spent putting the final few features into the application prototype, to have something to show on the day. The presentation itself I think went ok. The feedback I received was to focus more on the mental health side of the application rather than the physical fitness aspect which was what the prototype was mainly focused on.

A few weeks after this presentation we were sent our mid-point marks which account for 25% of the overall grade. I got a mark of 53%, which was below my target. To make up for this I must work harder in the second semester to achieve my target of a 2:1 final grade. The biggest companies while hiring graduates will look to those who achieved Firsts and 2:1 so for this reason I think it is very important to hit this goal, along with the fact that the higher your grade is the more money you earn out the gate.

After the mid-point presentation, my focus then turned to trying to finish the projects due for the rest of my subjects before turning my attention to the four exams we face in January. All but one of my modules this semester has a final exam, so the Christmas break will be mainly spent at a desk studying. The aim going into the exams is to have as much marks from the CA's as possible to take the pressure off the exam itself.

Once the exams are finished I plan to use the week we have off to return to working on my final project so I am a step ahead going into the second semester and can focus on getting my head around the new modules in the early weeks of the semester.

January:

I did not get much done in terms of the project in the early stages of January due to semester one exams. Having four exams really took up a lot of time with the amount of studying that entails. The four exams we had were on the 5th, 10th, 11th and 12th of January, the three being clustered together at the end made it difficult to decide which subject to put the most effort into.

Once the exams were over it was time to turn my attention back towards the project. The aim for the weeks following the exams was to try think of ways to implement the feedback I got from my midpoint presentation. I was told that the app was too fitness focused and that I should try reverse this trend in the direction of mental health.

So I needed to come up with ideas of how to incorporate mental health in a more prominent way into the app. The first idea I come up with was to implement some kind of spinner into the app that would return information on a number of mental health diseases such as depression. In this information page there is a section where I quote experts on these diseases on how they think the best way to start dealing with them is.

During this period, we received our exam results, I was happy enough with what I got but was 2% short of the target of a 2:1 I set myself before the start of the year. This short coming was mainly down to one subject which brought my average down. This was frustrating but at this stage there's nothing you can do about it.

Following these results, the aim is now to work harder in the second semester in an attempt to salvage a 2:1 with better results than the first semester. This is where the project plays a huge part down to the fact that it is a 20 credit module whereas the rest are only 5 credits each. This means a good final mark in the project is really make or break when it comes to your final overall grade.

The objectives for February are to continue trying to add more functions in the area of mental health, along with trying to push for the full 10% that is allocated towards

the testing section of the project. This is the final stretch in the project development cycle and probably the most important in terms of how the final app will turn out.

February:

The start of February came with a change in supervisor for my 4th year software project. This is think came as an opportunity for a fresh perspective and advise for the project. After meeting with Frances, my new supervisor, she set up a meeting for me with Catherine in Learning support. This was a huge help in terms of gathering new requirements for the mental health aspect of the application.

She introduced me to a new method people are using to relax themselves in mentally stressful situations called Mindfulness. Mindfulness refers to a depth of awareness that us at the very core of our being and the practice of mindfulness supports us in nourishing and cultivating this simple awareness. Introducing mindfulness into daily life supports us in living life with a sense of contentment and clarity, it nourishes the body, mind and emotions. This can be used by people who get anxious or nervous in certain situations to calm down and in turn perform better because of it.

Another feature that I have been contemplating implementing into the app is a chat service that will allow users to talk to a support agent when they feel like they're having a low moment. This obviously is difficult to do as I don't possess the facilities or manpower to be able to include such a feature. With this in mind I researched different API's and techniques people use to create a ChatBot. The idea behind this is to include a feature that talks to the user without having a real person on the other end. This feature will be used as a placemat to showcase to companies that may be interested in the app, who do possess the manpower to have people available 24/7 to talk to people, how this function looks and feels.

Another couple of small features that were gathered over this month are:

- Having links to useful websites easily available.

- Have helpline numbers available, that allow the user to call just by clicking on them.

March:

With only two months' left till the final project code had to be uploaded and one month till the end of the semester March was a busy month. As well as trying to finish projects for three other modules I had to find time to work on my project. Over the past month I have thinking of different functionality to include in the final app and have come up with a number of ideas I am considering including.

The first one was inspired by my final project for the Advanced Mobile Development module. For this project I developed a social media application. One the features of this app allows the user to create chatrooms about any topics of their choice and interact with other users either anonymously or if they choose to with their real name displayed to other users. This gave me the idea to include this feature in my app to allow users to share their experiences coping with mental health problems to other users. Users can share methods, articles or doctors that have helped them in the past.

From my research of the subject of mental health I found that many people don't actually know that much about it. With this in mind I tried to think of a fun way to inform people. I came up with the idea of including a quiz about mental health in the app for people to tests their knowledge as well learn more about the subject on a broad scale. While not being a main feature of the app, I thought this would be an interesting way for people to get interested in the topic. Picking the questions for this quiz was a challenge due to the vast amount of information and opinions available on various topics revolving around mental health.

Due to adding more features to the app the design will have to be changed to accommodate these changes. Originally all features were available via a button from the homepage. With the extra features now being added I think the apps

layout would work best if on the homepage the user had two options. Whether to interact with the physical or mental focused features of the application. The idea behind this is to not overwhelm the user once they land on the homepage with too many options. Simpler is better when it comes to designing an application.

The next step after these features have been implemented completely is to test the application. Two products I am considering using for this are Espresso and JUnit. I have used these two applications for testing during my Advanced Mobile Dev project which is why I have chosen to use them for this project also.