Configuration Manual

MSc Research Project
MSc in Cyber Security

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School of Computing
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MSc Project Submission Sheet

School of Computing

Student Name:	Chirag Chaudhary
Student ID:	X19213808
Programme:	MSc in Cyber Security **Year:** 2020-21
Module:	MSc Research Project/Internship
Lecturer:	Prof. Vikas Sahni
Submission Due Date:	6th September 2021
Project Title:	Novel Approach to Detect SQL Injection Attacks
Word Count:	…………………473…………………… **Page Count:** ……7………………

I hereby certify that the information contained in this (my submission) is information pertaining to research I conducted for this project. All information other than my own contribution will be fully referenced and listed in the relevant bibliography section at the rear of the project.

ALL internet material must be referenced in the bibliography section. Students are required to use the Referencing Standard specified in the report template. To use other author's written or electronic work is illegal (plagiarism) and may result in disciplinary action.

Signature: CHIRAG CHAUDHARY

Date: 1ST September 2021

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Attach a Moodle submission receipt of the online project submission, to each project (including multiple copies).	□
You must ensure that you retain a HARD COPY of the project, both for your own reference and in case a project is lost or mislaid. It is not sufficient to keep a copy on computer.	□

Assignments that are submitted to the Programme Coordinator Office must be placed into the assignment box located outside the office.

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Configuration Manual

Chirag Chaudhary
Student ID: x19213808

1 Configuration Manual Introduction

This configuration manual contains the description of all the hardware and the software tools that are used to implement and execute the project. This configuration manual also comprises of the setup and steps followed through out for the installation of the software tools, execution of the code and commands for the execution of the entire project to attain the final output.

2 Hardware Details

2.1 Specification

Machine learning algorithms and execution requires a lot of resources. The following are the hardware details for my hosted Computer system. These aren't the fundamental essentials. The specifications of each software can be found by going to their individual websites. The performance of the project will be influenced by the value variation.

2.2 Hardware

Device Specifications

Device Name	DESKTOP-41TPEPS
Processor	Intel® Core™ i5-7200U CPU @ 2.50GHz 2.70 GHz
System Type	64-bit Operating System, x64-based Processor
Installed RAM	12.0 GB (11.8 GB usable)
Pen and Touch	No pen or touch input is available for the display

Operating System Specifications

Edition	Windows 10 Pro
Version	20H2
Installed on	8/25/2021
OS build	19042.1052
Experience	Windows Feature Experience Pack 120.2212.2020.0

3   Software Details

For the development and the execution of this project I have used the Anaconda Navigator version 2.0.3. Anaconda Navigator is a desktop graphical user interface (GUI) that comes with the Anaconda® distribution and supports multiple programs to run and manage conda packages, environments, and channels without having to use command-line commands (CLI) (Inc., 2021).

We have used the Jupyter Notebook version 6.3.0 application to run, train and test the machine learning algorithms which is a web-based, interactive computing notebook environment which edit and run human-readable docs while describing the data analysis. You may use the Jupyter Notebook application to create and update documents that show the input and output of a Python or R script. You can share these files with others once they've been saved. NOTE: The Python and R languages are available by default, but Notebook can be customized to run a variety of different kernel environments.

4   Experimental Set-up

4.1   Files uploaded: There are two data source files,

4.1.1   plain.txt

4.1.2.   sql_querys.txt

Both the files are stored in the folder TrainingData. These files have to be imported in the python Jupyter notebook file "Research Code for Detecting sql injection.ipynb".

The figure shown below, shows the code where the path of the dataset needs to be changed. The variable "basedir" stores the location of the files. Currently the path is set up according to the system used.

To load the data please change the path according to the machine in the "basedir" variable.

```
# Reading data from file "trainingdata"
basedir = 'C:/Users/Chirag/Desktop/TrainingData'
filelist = os.listdir(basedir)
df_list = []
```

5 CODE FILE:

"Research Code for Detecting sql injection.ipynb " This is the python Jupyter notebook that contains the code script. To execute our solution, this file needs to be run in a Anaconda IDE > Jupyter Notebook shown in the figure below.
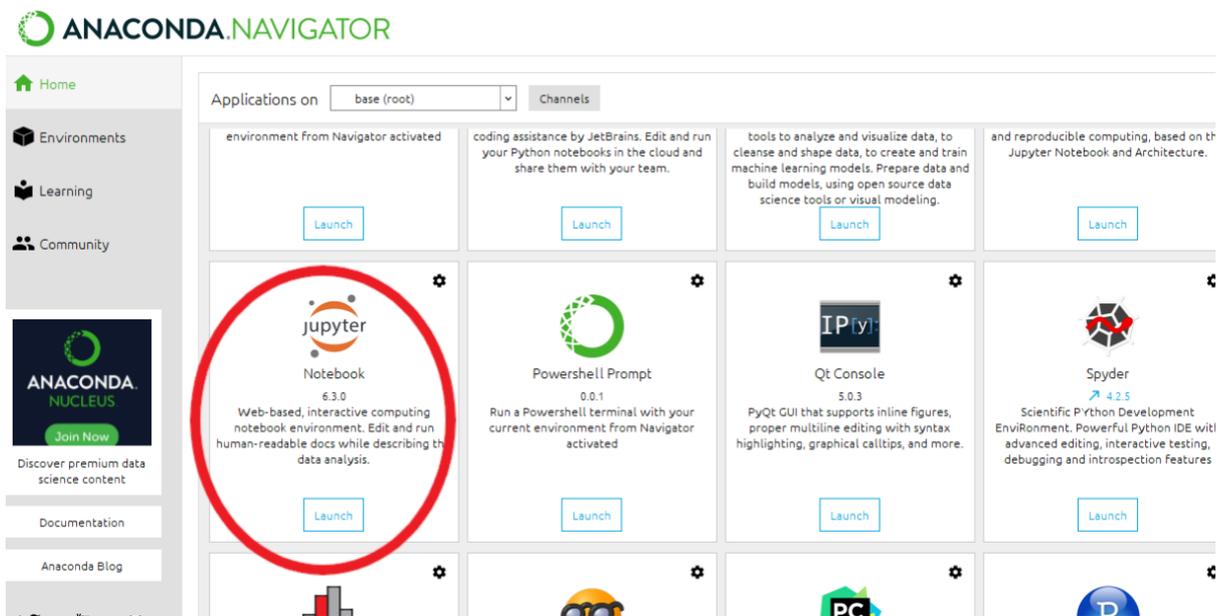
6 References

Inc., A., 2021. *Anaconda Individual Edition.* [Online]
Available at: https://www.anaconda.com/products/individual-d
[Accessed 04 July 2021].

Appendix H – Monthly Internship Activity Report

The Internship Activity Report is a 1-page monthly summary of the activities performed by you and what you have learned during that month. The Internship Activity Report must be signed off by your Company and included in the configuration manual as part of the portfolio submission.

Student Name: ___Chirag Chaudhary_. Company: _Dataships Limited_

Student number: _x19213808_. Month Commencing: ___JUNE___

- Analysing the security events and the activities performed over the network for potential threats.

- Analysing the web applications for Injection Vulnerabilities.

- Using wireshark to inspect the traffic, targeting the SQL injection vulnerabilities.

- Conducting penetration testing on 2 web applications of the Dataships Limited and 1 website.

- Using the tools such as Nikto, Burpsuite, nmap, sqlmap, and other tools.

- Configuring Cloud trail and cloud watch over AWS to capture the logs, activities and alerts for analysis.

Employer comments

Chirag has been working for Dataships and its clients on the security related activities and events. As of now, he is working on the above mentioned tasks. He is also carring out research to identify security vulnerabilities and finds out their recommendations.

Student Signature: _CHIRAG CHAUDHARY_ Date: _25 June 2021_

Industry Supervisor Signature: _____ Date: _1 July 2021_

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Student Name: ___Chirag Chaudhary_. Company: _Dataships Limited_

Student number: _x19213808_. Month Commencing: _____JULY_____

Implemented the below mentioned tasks:

- Performed Data Preparation (Data cleaning: Removed Null Values).

- Created Regular Expression (sql_regex).

- Created Tokens – defined a function called Sql_tokenizer.

- Implemented G-test score, G-test, Entropy , G-means.

- Define training data and test data.

- Configured IAM over AWS wherein creating groups and assigning policies.

- Created new S3 bucket to store the logs delivered from CloudTrail.

Employer comments

```
        Chirag had been doing the work mentioned above.
He had been doing the work properly as per our expectations.
```

Student Signature: _CHIRAG CHAUDHARY_   Date: _9 August 2021_

Industry Supervisor Signature: _____   Date: _10 August 2021_

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Student Name: ___Chirag Chaudhary_. Company: _Dataships Limited_

Student number: _x19213808_. Month Commencing: _____August_____

Implemented the below mentioned tasks:

- Finalized the dataset by including all the relevant features.

- Listed feature vectors.

- Encoded categorical features (converted all the non-numerical data into numerical using Label encoding function).

- Enabled Multi Factor Authentication on AWS IAM users.

- Enabled and configured CloudWatch on AWS.

- Enabled and configured Simple Notification Services on AWS.

Employer comments

Chirag worked to configure the roles and authorisations in AWS IAM.
Overall he did a good job throughout his internship.

Student Signature: _CHIRAG CHAUDHARY_   Date: _30 August 2021_

Industry Supervisor Signature: _____   Date: ___31/08/2021_____