National College of Ireland

# Configuration Manual

MSc Internship
Cyber Security

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**MSc Project Submission Sheet**

**School of Computing**

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**Programme:** Msc Cyber security **Year:** 2019-2020

**Module:** Msc. Internship

**Lecturer:** Prof. Niall Hefernan

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**Project Title:** Analysis and Detection of Unauthorized Access Points Using various Machine Learning Algorithms.

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# Configuration Manual

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## 1 Summary:

The paper discussed describes the method to generate simulation data in a network with the ping times of the nodes and the total time to live (TTL) data, also we have completed programs on SVM, KNN and machine learning algorithm Ant Colony optimization. We have used libraries matplotlib to generate graphs and pandas and numpy to work with arrays and lists, and sklearn for various algorithms discussed in the main paper.

## 2 Tools used:

The implementation is mainly done on Python and Custom simulation application developed on python and can be run anywhere where python is installed.

1. Python: to develop scripts and to run machine learning algorithm and to run clustering algorithms
2. Simulation app (simulation.py): used to generate network ping simulated data with N number of nodes and X percentage of deviation representing infected nodes
3. Matplotlib: used to generate graphs and comparison visualization

## 3 Download and Installation:

### 3.1 Python

Download the latest version of python from : https://www.python.org/downloads/ and follow installation instructions to install on windows machine.

### 3.2 Matplotlib

Use below command to install python matplotlib package in python installed in windows machine:

**py -m pip install matplotlib (or) python -m pip install matplotlib**

### 3.3 pandas

Pandas is data manipulation tool and data analysis tool and can be installed using pip on python.

**py -m pip install matplotlib (or) python -m pip install matplotlib**

### 3.4 numpy

Numpy is python library used to work on arrays, can be installed into python using bellow command in the command prompt in windows

**py -m pip install numpy (or) python -m pip install numpy**

3.5 sklearn
Used for various classification, regression, and clustering algorithms. Can be installed on python in windows using below command.
**py -m pip install sklearn (or) python -m pip install sklearn.**

# 4 Configuration and Exceution:

**4.1 Simulation.py – Python file for Simulation which generates the dataset.**
*Command to start the python on windows:*
**python simulation.py <no of nodes> <percentage of exposed nodes>**
Example: py simulation.py 1000 5

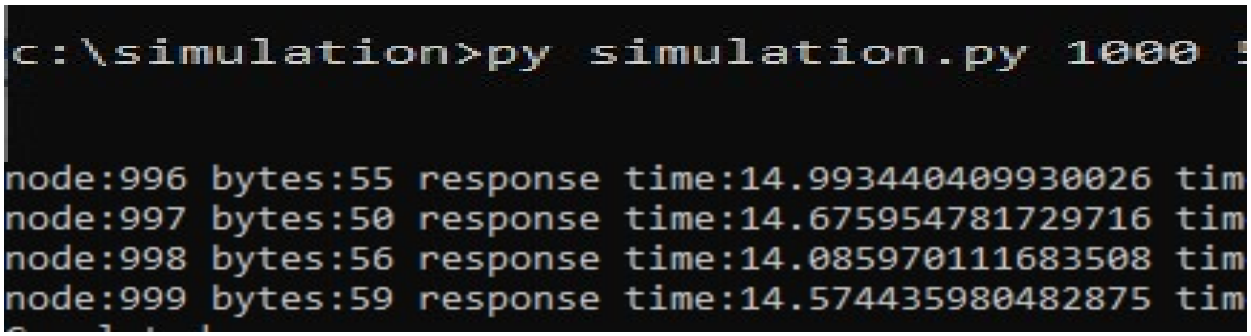

*Figure 1: Simulation.py execution command*

4.2 knn.py – KNN algorithm source code file
***Command for the KNN algorithm:*****py knn.py (or) python knn.py**

*Figure 2: KNN code exceuction command*

4.3 svm.py – Support vector
***Command for the SVM algorithm:*** **py svm.py (or) python svm.py**

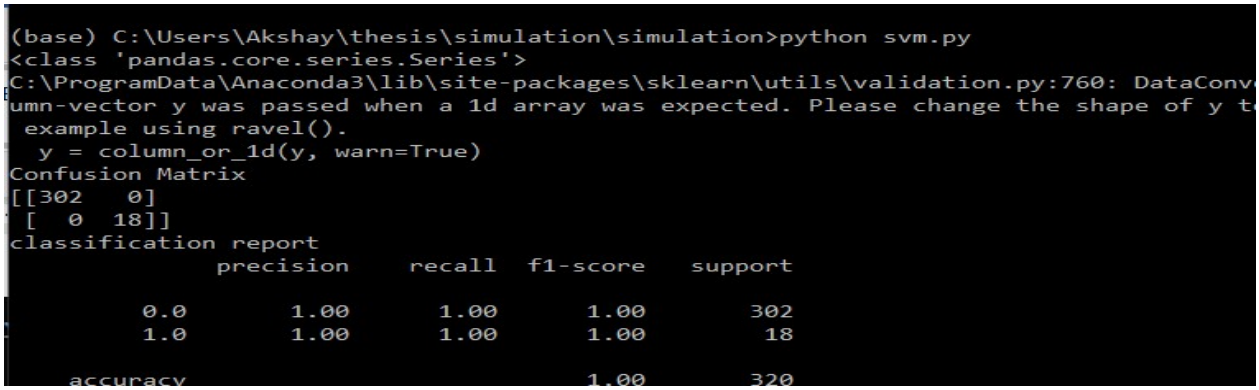

*Figure 3: SVM execution command*

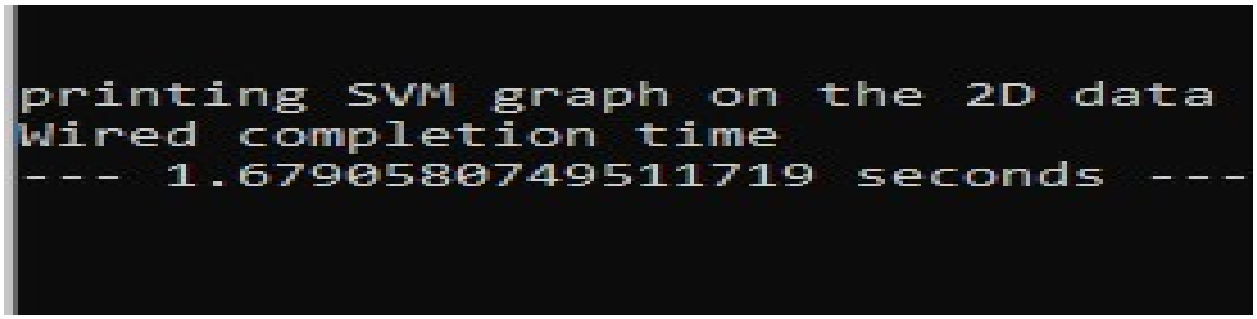


*Figure 4: Printing of SVM Graphs that will be stored in the file*

4.4 aco.py – Ant colony Optimization
***Command for ClusterACO algorithm:*** **py ClusterACO.py (or) python ClusterACO.py**


*Figure 5: ClusterACO execution command*

# References

[1] "Download Python," *Python.org*, 2019. [Online]. Available:https://www.python.org/downloads/. [Accessed: 15-Jun-2020].
[2] ]"Matplotlib: Python plotting — Matplotlib 3.1.1 documentation," *Matplotlib.org*, 2012. [Online]. Available: https://matplotlib.org/. [Accessed: 16-Jun-2020].