

Configuration Manual

MSc Internship
Cyber Security

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MSc Project Submission Sheet
School of Computing



Student Name: Adeola Daniel Ajiginni

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Programme: Cybersecurity

Year: 2019/2020

Module: Internship

Supervisor: Vikas Sahni

Submission

Due Date:

Project Title: IDENTIFICATION AND CLASSIFICATION OF IP SPOOFING MAN IN THE MIDDLE ATTACK USING MULTILAYER PERCEPTRON

Word Count: **Page Count:**

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Configuration Manual

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1 Introduction

This file contains step by step instructions to be followed to completely reproduce Identification and Classification of IP Spoofing Man in the Middle Attack using Multilayer Perceptron

2 Environment set-up

This are the environments and libraries that were used and should be set-up if you do not have the environment.

PYTHON INSTALLATION

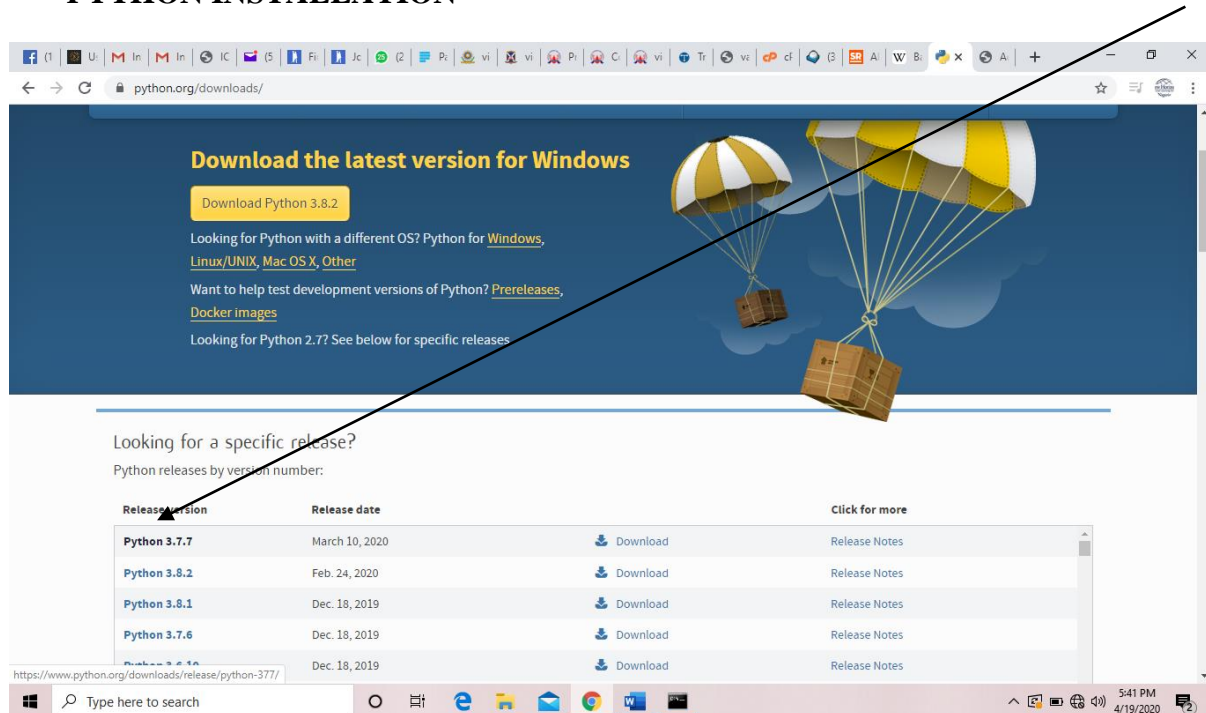


Figure 2. download of Python

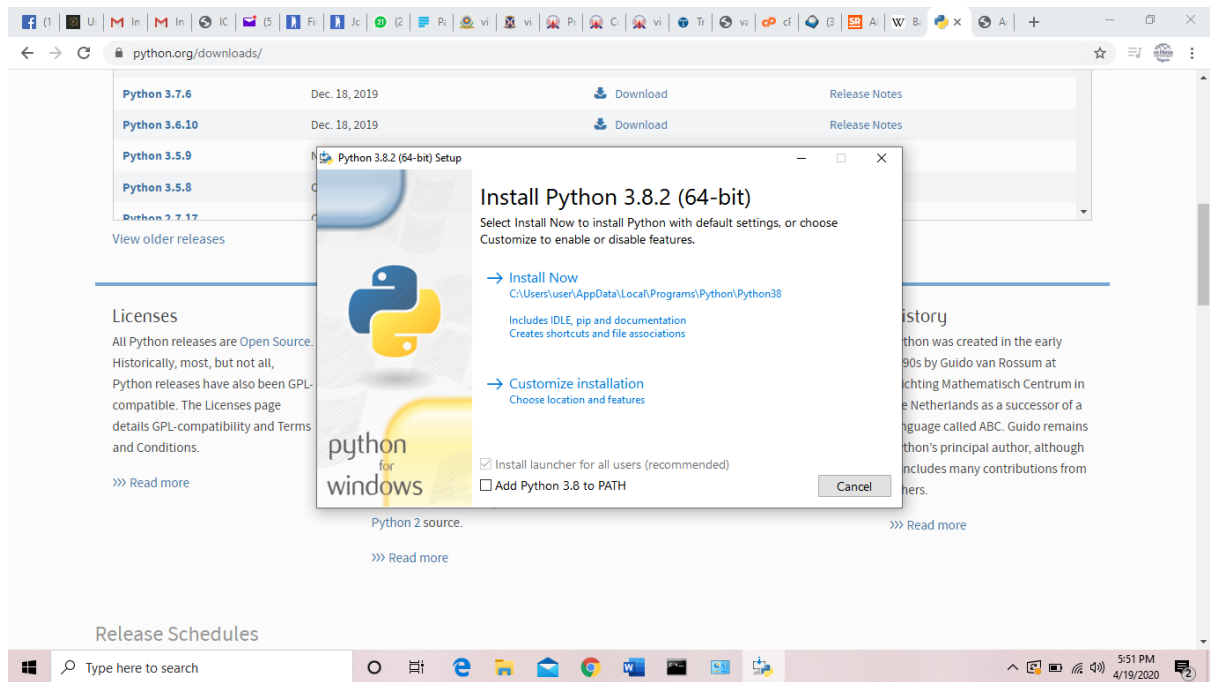


Figure 2.1 Python Installation

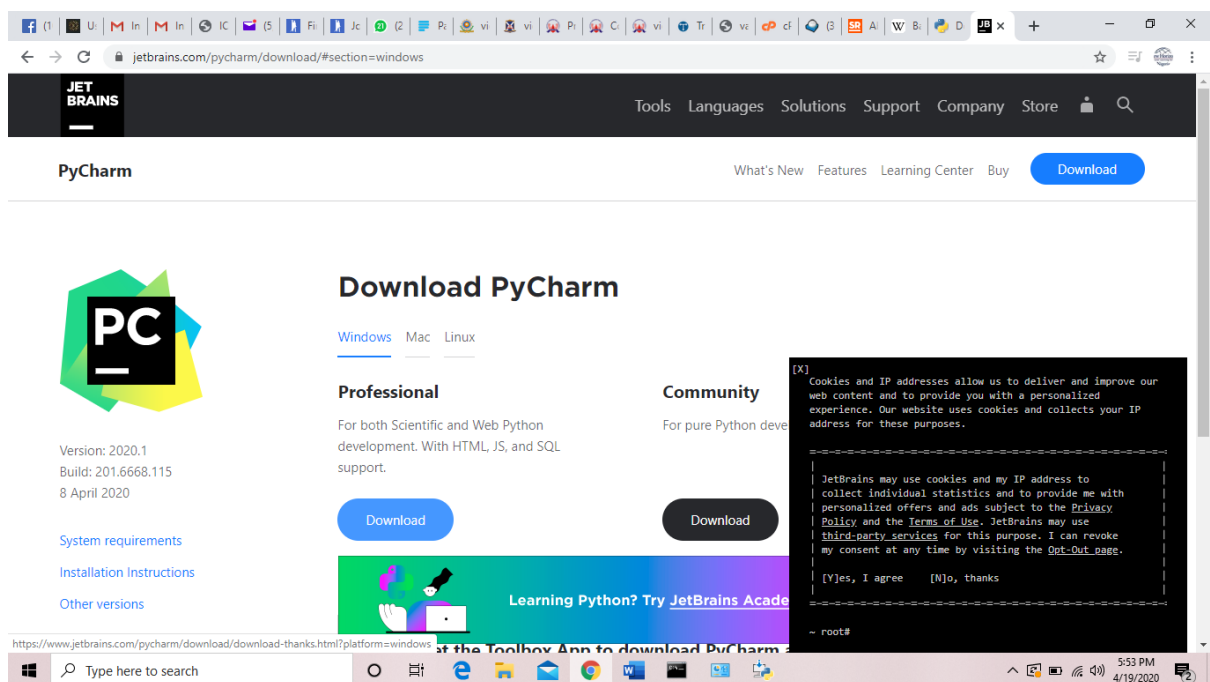


Figure 2.2 Pycharm download

```
Command Prompt
C:\Users\User\AppData\Local\Programs\Python>cd python38

C:\Users\User\AppData\Local\Programs\Python\Python38>pip install numpy
Requirement already satisfied: numpy in c:\users\user\appdata\local\programs\python\python36\lib\site-packages (1.18.2)
You are using pip version 18.1, however version 20.0.2 is available.
You should consider upgrading via the 'python -m pip install --upgrade pip' command.

C:\Users\User\AppData\Local\Programs\Python\Python38>pip install matplotlib
Collecting matplotlib
  Downloading https://files.pythonhosted.org/packages/59/77/7a13ef25b658311d860374959c129cd60ef0eb26979aba7a7ed5b9e792/matplotlib-3.2.1-cp36-cp36m-win_amd64.whl (9.2MB)
100% |#####| 9.2MB 241KB/s
Collecting kiwisolver>=1.0.1 (from matplotlib)
  Downloading https://files.pythonhosted.org/packages/2a/1e/f53031838c75cef71086ab7fc0dea1853d811ba3ec72465d782877223f09/kiwisolver-1.2.0-cp36-none-win_amd64.whl (57kB)
100% |#####| 61kB 1.1MB/s
Requirement already satisfied: numpy>=1.11 in c:\users\user\appdata\local\programs\python\python36\lib\site-packages (from matplotlib) (1.18.2)
Collecting cyclar>=0.10 (from matplotlib)
  Using cached https://files.pythonhosted.org/packages/f7/d2/e07d3eb2bd7af66448ce7e754c59dd546fe1bbe732c8ab68b9c834e61/cyclar-0.10.0-py2.py3-none-any.whl
Collecting pyparsing!=2.0.4,!=2.1.2,!=2.1.6,>=2.0.1 (from matplotlib)
  Downloading https://files.pythonhosted.org/packages/8a/bb/488841f56197b13700afd5658fc279a2025a39e22449b7cf29864669b15d/pyparsing-2.4.7-py2.py3-none-any.whl (67kB)
100% |#####| 71kB 1.2MB/s
Requirement already satisfied: python-dateutil>=2.1 in c:\users\user\appdata\local\programs\python\python36\lib\site-packages (from matplotlib) (2.8.1)
Requirement already satisfied: six in c:\users\user\appdata\local\programs\python\python36\lib\site-packages (from cyclar>=0.10->matplotlib) (1.14.0)
Installing collected packages: kiwisolver, cyclar, pyparsing, matplotlib
Successfully installed cyclar-0.10.0 kiwisolver-1.2.0 matplotlib-3.2.1 pyparsing-2.4.7
You are using pip version 18.1, however version 20.0.2 is available.
You should consider upgrading via the 'python -m pip install --upgrade pip' command.

C:\Users\User\AppData\Local\Programs\Python\Python38>
```

Figure 2.3 Matplotlib library has been installed.

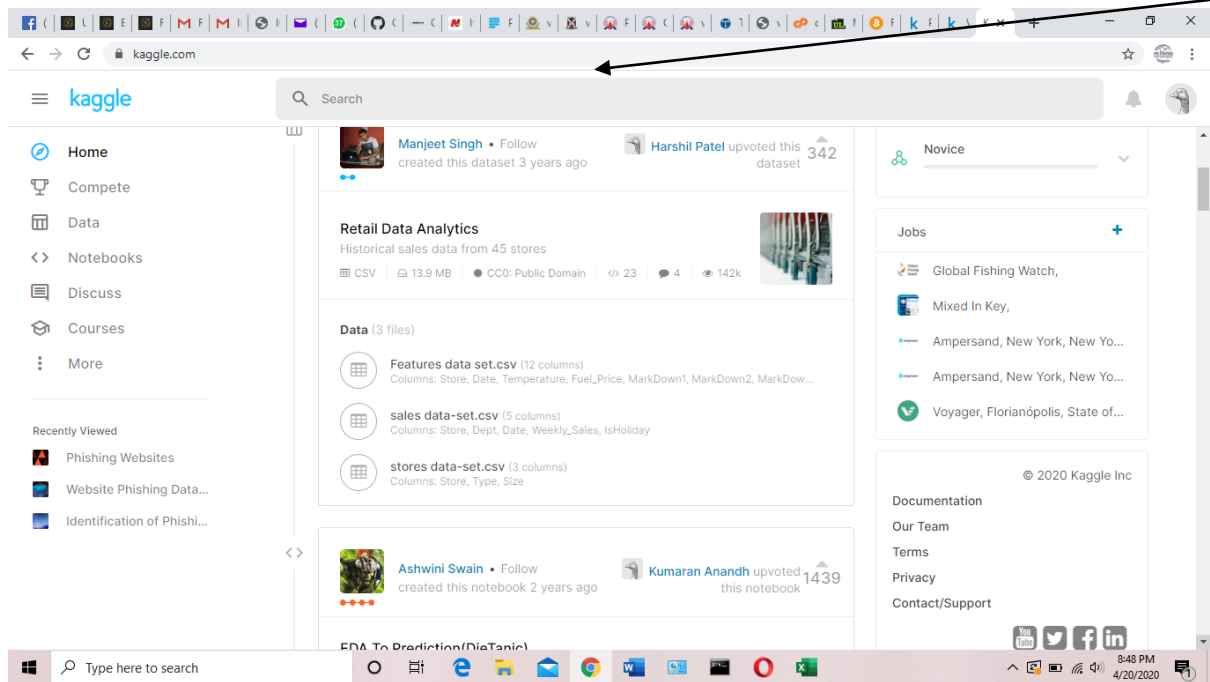
```
Command Prompt - pip install tensorflow==2.0.0
0)
Collecting markdown>=2.6.8 (from tensorflow==2.0.0)
  Using cached https://files.pythonhosted.org/packages/ab/c4/ba46d448556eb1770a12edace5a165a0c6de13349f592b9036257f3c3d3/Markdown-3.2.1-py2.py3-none-any.whl
Collecting google-auth>=1.6.3 (from tensorflow==2.0.0)
  Downloading https://files.pythonhosted.org/packages/4f/97/5e7083a5be4cbd1d928061c9d9cb3c070e55da15c563be41cb47b544807/google_auth-1.14.0-py2.py3-none-any.whl (88kB)
100% |#####| 92kB 423KB/s
Collecting werkzeug>=0.11.15 (from tensorflow==2.0.0)
  Downloading https://files.pythonhosted.org/packages/cc/94/5f7079a0e0b0d6863ef8f1da638721e9da21e5bacee597595b318f71d62e/Werkzeug-1.0.1-py2.py3-none-any.whl (298kB)
100% |#####| 307kB 2.0MB/s
Collecting requests>=2.21.0 (from tensorflow==2.0.0)
  Using cached https://files.pythonhosted.org/packages/1a/70/1935c770cb3be63a8b78ced23d7e0f3b187f5cbfab4749523ed65d7c9b1/requests-2.23.0-py2.py3-none-any.whl
Collecting google-auth-oauthlib<0.5,>=0.4.1 (from tensorflow==2.0.0)
  Using cached https://files.pythonhosted.org/packages/7b/b8/88def36e74bee9fce511c9519571f4e485e98093ab7442284f4ffae60b/google_auth_oauthlib-0.4.1-py2.py3-none-any.whl
Collecting rsa<4.1,>=3.1.4 (from google-auth>=1.6.3->tensorflow==2.0.0)
  Using cached https://files.pythonhosted.org/packages/02/e5/38518af393f7c214357079ce67a317307936896e961e35450b70fad2a9cf/rsa-4.0-py2.py3-none-any.whl
Collecting cachetools<5.0,>=2.0.0 (from google-auth>=1.6.3->tensorflow==2.0.0)
  Downloading https://files.pythonhosted.org/packages/b3/59/524ffb454d05001e2be74c14745b485681c6ed5f2e625f71d135704c0909/cachetools-4.1.0-py3-none-any.whl
Collecting pyasn1-modules>=0.2.1 (from google-auth>=1.6.3->tensorflow==2.0.0)
  Using cached https://files.pythonhosted.org/packages/95/de/214830a981892a3e286c3794f41ae67a4495df1108c3da8a9f62159b9a9d/pyasn1_modules-0.2.8-py2.py3-none-any.whl
Collecting certifi>=2017.4.17 (from requests>=2.21.0->tensorflow==2.0.0)
  Downloading https://files.pythonhosted.org/packages/57/2b/26e37a4b034800c960a00c4e1b3d9ca5d7014e983e6e729e33ea2f36426c/certifi-2020.4.5.1-py2.py3-none-any.whl (157kB)
100% |#####| 163kB 1.9MB/s
Collecting idna<3,>=2.5 (from requests>=2.21.0->tensorflow==2.0.0)
  Using cached https://files.pythonhosted.org/packages/89/e3/afebe61c546d18fb1709a61bee788254b40e736c77271c7de5de2dc4128/idna-2.9-py2.py3-none-any.whl
Collecting urllib3!=1.25.0,!=1.25.1,<1.26,>=1.21.1 (from requests>=2.21.0->tensorflow==2.0.0)
  Downloading https://files.pythonhosted.org/packages/e1/e5/df302e8017440f111c41a0b432838672f5a70aa29227bf58149dc72f/urllib3-1.25.9-py2.py3-none-any.whl (126kB)
100% |#####| 133kB 1.3MB/s
Collecting chardet<4,>=3.0.2 (from requests>=2.21.0->tensorflow==2.0.0)
  Using cached https://files.pythonhosted.org/packages/bc/a9/01ffebfb562e4274b6487b4bb1ddc7ca55ec7510b22e4c51f14098443b8/chardet-3.0.4-py2.py3-none-any.whl
Collecting requests-oauthlib>=0.7.0 (from google-auth-oauthlib>=0.4.1->tensorflow==2.0.0)
  Using cached https://files.pythonhosted.org/packages/a3/12/b92740d845ab62ea4edf04d2f4164d82532b5a0b03836d4d4e71c6f3d379/requests_oauthlib-1.3.0-py2.py3-none-any.whl
Collecting pyasn1>=0.1.3 (from rsa<4.1,>=3.1.4->google-auth>=1.6.3->tensorflow==2.0.0)
  Using cached https://files.pythonhosted.org/packages/62/1e/a94a8d635fa3ce4cfc7f506003548d0a2447ae7fd5ca53932970fe3053f/pyasn1-0.4.8-py2.py3-none-any.whl
Collecting oauthlib>=3.0.0 (from requests-oauthlib>=0.7.0->google-auth-oauthlib>=0.4.1->tensorflow==2.0.0)
  Using cached https://files.pythonhosted.org/packages/05/57/ce2e7a8fa7c0afb54a0581b14a65b56e62b5759dbc98e80627142b8a3704/oauthlib-3.1.0-py2.py3-none-any.whl
tensorflow 2.0.2 has requirement setuptools>=41.0.0, but you'll have setuptools 40.6.2 which is incompatible.
Installing collected packages: astor, wrapt, termcolor, protobuf, google-pasta, grpcio, opt-einsum, wheel, tensorflow-estimator, absl-py, markdown, pyasn1, rsa, cachetools, pyasn1-modules, google-auth, werkzeug, certifi, idna, urllib3, chardet, requests, oauthlib, requests-oauthlib, google-auth-oauthlib, tensorflow, gast, tensorflow
Running setup.py install for wrapt ... done
Running setup.py install for termcolor ... done
Running setup.py install for absl-py ... done
```

Figure 2.4 Keras and Tensorflow libraries have been installed

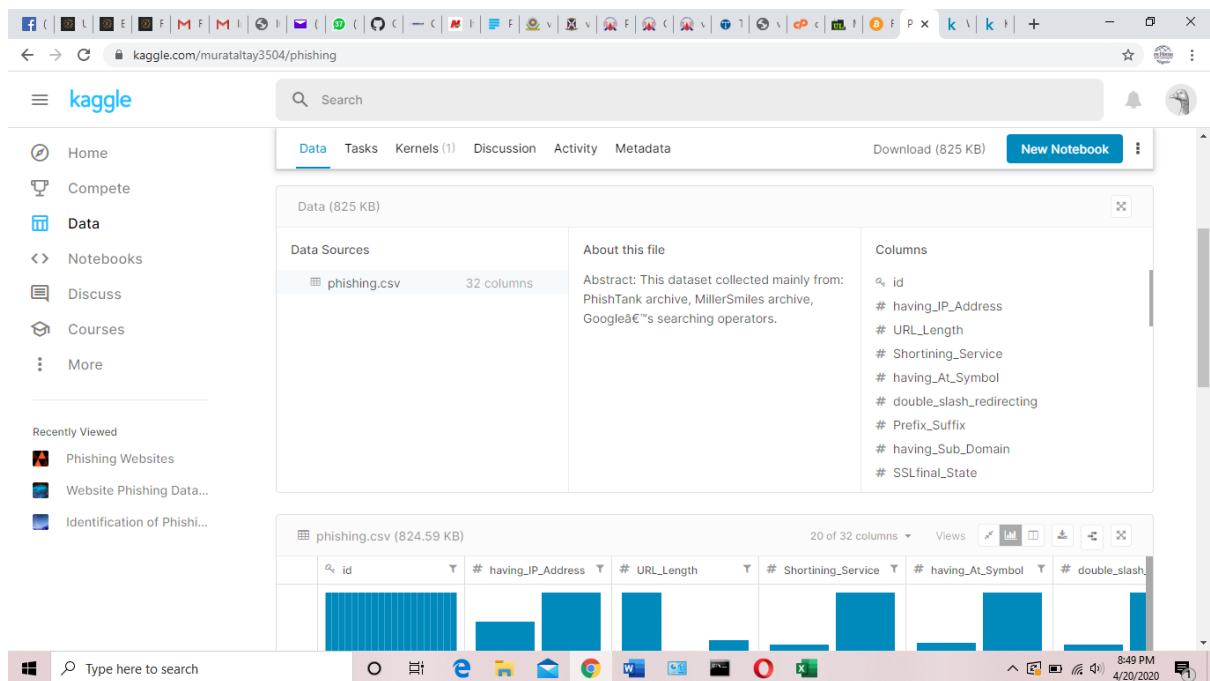
3 Implementation

3.1 Data source

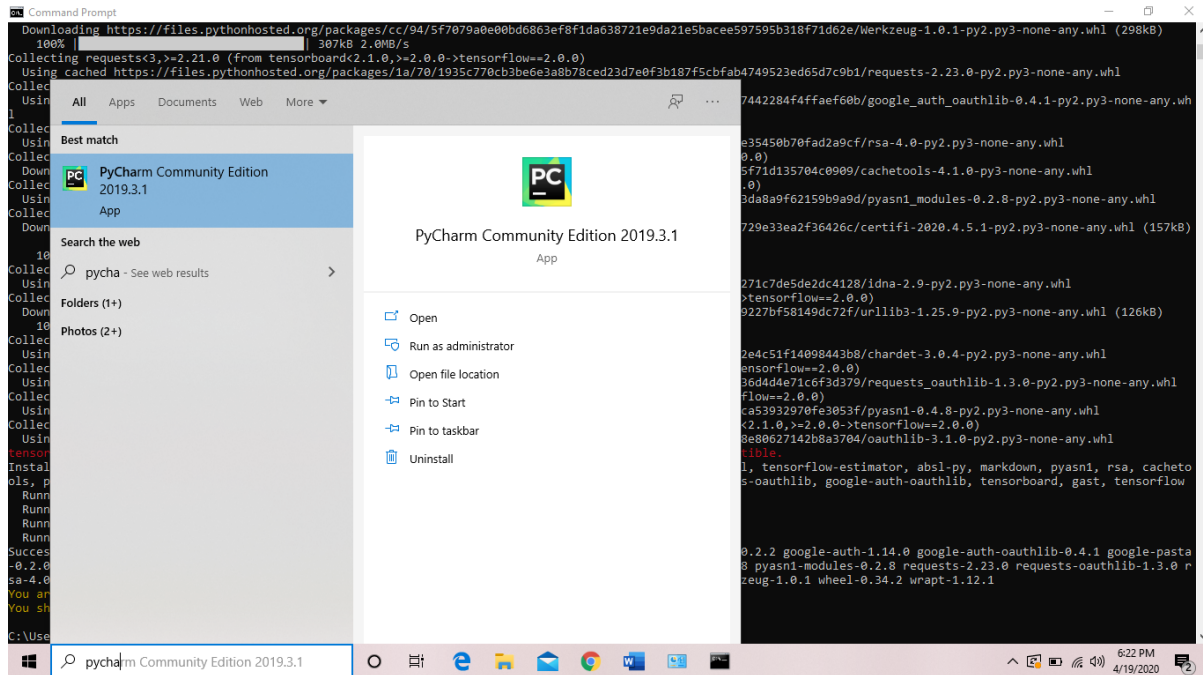
The data used in this project was gotten from kaggle.



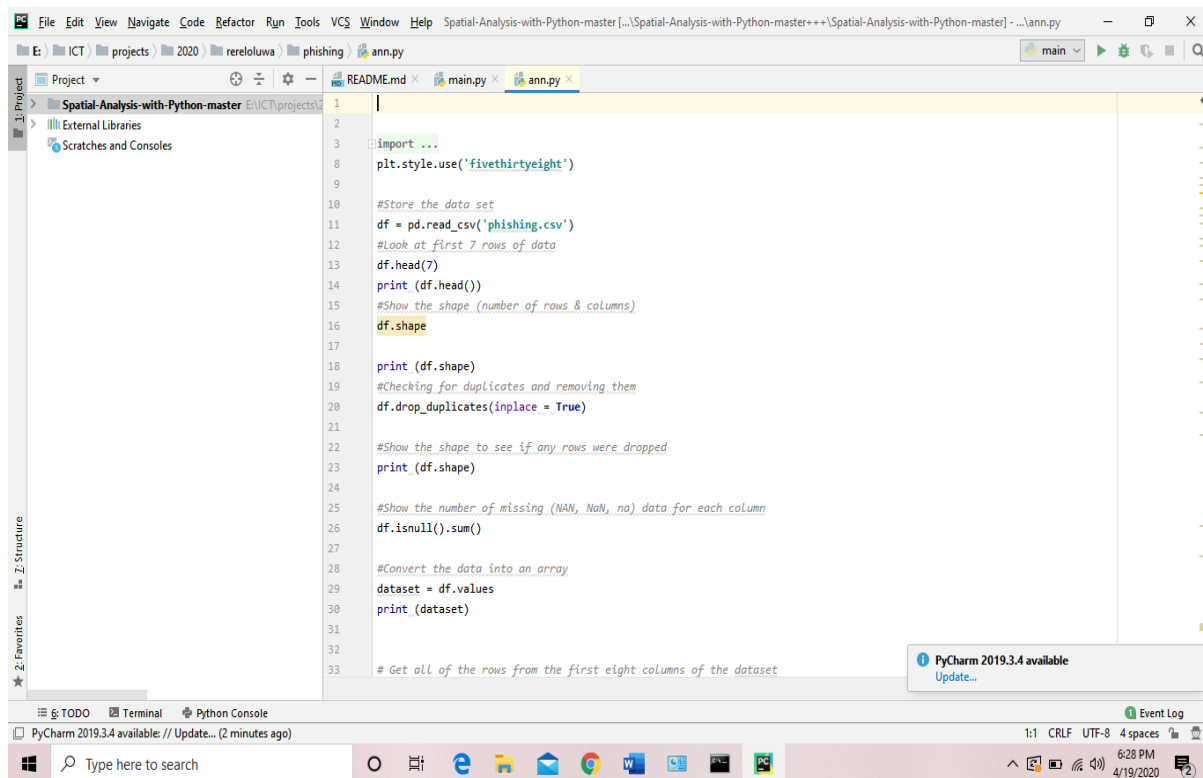
Dataset Download from Kaggle



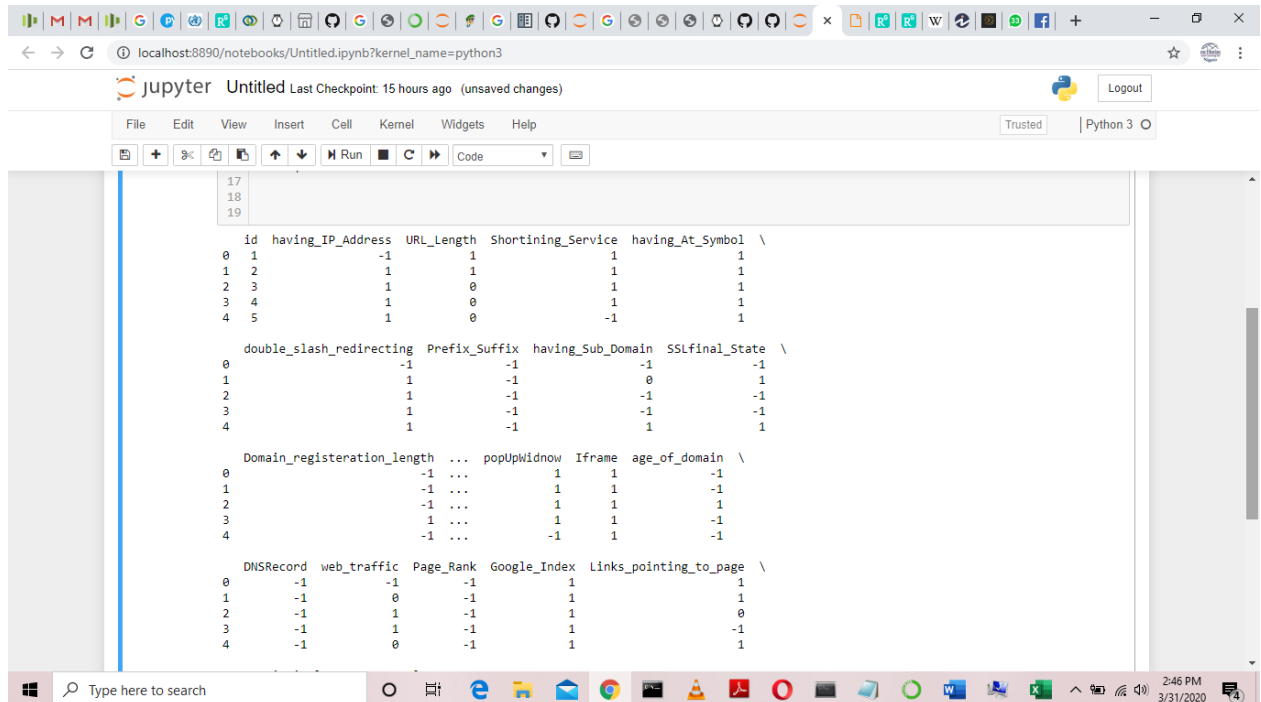
2.0 Launch Pycharm application



2.4 Code input



2.5 Output



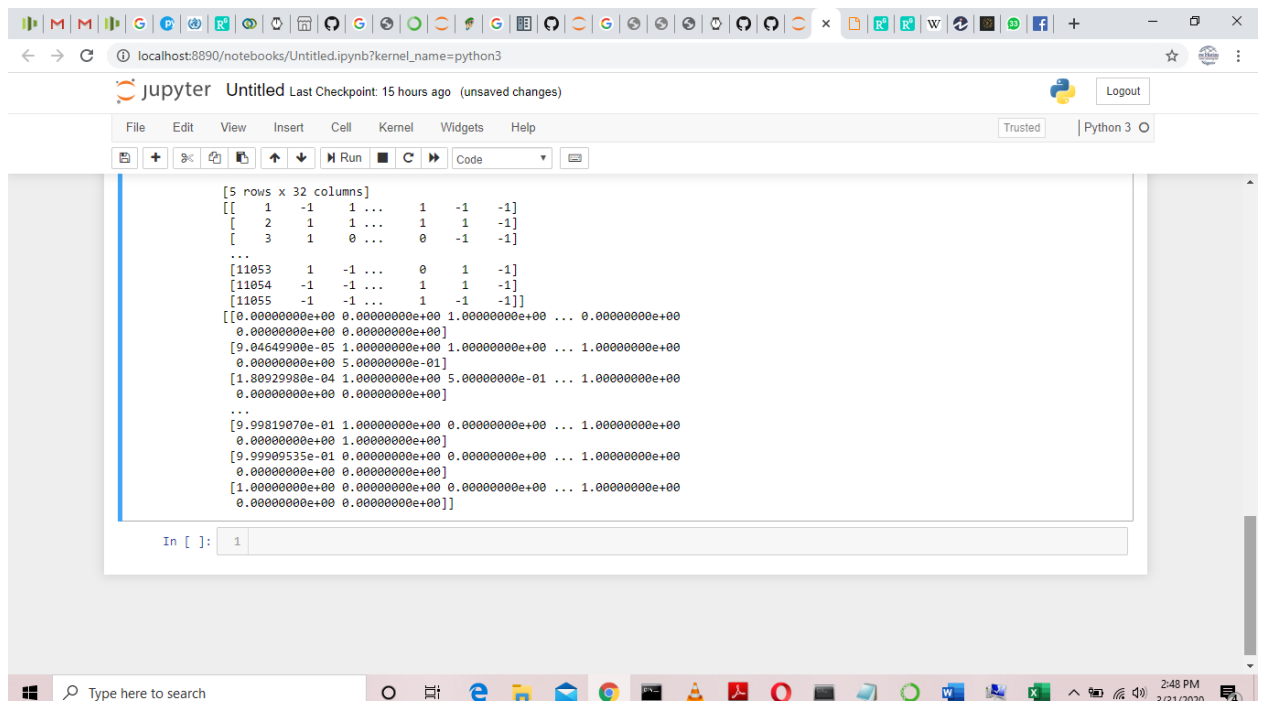
A screenshot of a Jupyter Notebook interface. The browser address bar shows 'localhost:8890/notebooks/Untitled.ipynb?kernel_name=python3'. The Jupyter header includes 'jupyter', 'Untitled', 'Last Checkpoint: 15 hours ago (unsaved changes)', and a 'Logout' button. The menu bar contains 'File', 'Edit', 'View', 'Insert', 'Cell', 'Kernel', 'Widgets', and 'Help'. The toolbar has icons for file operations, running, and code execution. The code cell contains a DataFrame with 5 rows and 10 columns of binary features. The features are: 'id', 'having_IP_Address', 'URL_Length', 'Shortning_Service', 'having_At_Symbol', 'double_slash_redirecting', 'Prefix_Suffix', 'having_Sub_Domain', 'SSLfinal_State', 'Domain_registration_length', 'popUpWidnow', 'Iframe', 'age_of_domain', 'DNSRecord', 'web_traffic', 'Page_Rank', 'Google_Index', and 'Links_pointing_to_page'.

```
17
18
19
id having_IP_Address URL_Length Shortning_Service having_At_Symbol \
0 1 -1 1 1 1
1 2 1 1 1 1
2 3 1 0 1 1
3 4 1 0 1 1
4 5 1 0 -1 1

double_slash_redirecting Prefix_Suffix having_Sub_Domain SSLfinal_State \
0 -1 -1 -1 -1
1 1 -1 0 1
2 1 -1 -1 -1
3 1 -1 -1 -1
4 1 -1 1 1

Domain_registration_length ... popUpWidnow Iframe age_of_domain \
0 -1 ... 1 1 -1
1 -1 ... 1 1 -1
2 -1 ... 1 1 1
3 -1 ... 1 1 -1
4 -1 ... -1 1 -1

DNSRecord web_traffic Page_Rank Google_Index Links_pointing_to_page \
0 -1 -1 -1 -1 1
1 -1 0 -1 1 1
2 -1 1 -1 1 0
3 -1 1 -1 1 -1
4 -1 0 -1 1 1
```



A screenshot of a Jupyter Notebook interface, similar to the one above. The browser address bar shows 'localhost:8890/notebooks/Untitled.ipynb?kernel_name=python3'. The Jupyter header includes 'jupyter', 'Untitled', 'Last Checkpoint: 15 hours ago (unsaved changes)', and a 'Logout' button. The menu bar contains 'File', 'Edit', 'View', 'Insert', 'Cell', 'Kernel', 'Widgets', and 'Help'. The toolbar has icons for file operations, running, and code execution. The code cell contains a DataFrame with 5 rows and 32 columns of binary features. The features are: 'id', 'having_IP_Address', 'URL_Length', 'Shortning_Service', 'having_At_Symbol', 'double_slash_redirecting', 'Prefix_Suffix', 'having_Sub_Domain', 'SSLfinal_State', 'Domain_registration_length', 'popUpWidnow', 'Iframe', 'age_of_domain', 'DNSRecord', 'web_traffic', 'Page_Rank', 'Google_Index', 'Links_pointing_to_page', and 17 other unnamed binary features.

```
[5 rows x 32 columns]
[[ 1 -1 1 ... 1 -1 -1]
 [ 2 1 1 ... 1 1 -1]
 [ 3 1 0 ... 0 -1 -1]
 ...
 [11053 1 -1 ... 0 1 -1]
 [11054 -1 -1 ... 1 1 -1]
 [11055 -1 -1 ... 1 -1 -1]]
[[0.00000000e+00 0.00000000e+00 1.00000000e+00 ... 0.00000000e+00
 0.00000000e+00 0.00000000e+00]
 [9.04649900e-05 1.00000000e+00 1.00000000e+00 ... 1.00000000e+00
 0.00000000e+00 5.00000000e-01]
 [1.80929980e-04 1.00000000e+00 5.00000000e-01 ... 1.00000000e+00
 0.00000000e+00 0.00000000e+00]
 ...
 [9.99819070e-01 1.00000000e+00 0.00000000e+00 ... 1.00000000e+00
 0.00000000e+00 1.00000000e+00]
 [9.99909535e-01 0.00000000e+00 0.00000000e+00 ... 1.00000000e+00
 0.00000000e+00 0.00000000e+00]
 [1.00000000e+00 0.00000000e+00 0.00000000e+00 ... 1.00000000e+00
 0.00000000e+00 0.00000000e+00]]
```