# Configuration Manual

MSc Internship
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**MSc Project Submission Sheet**

**School of Computing**

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| **Programme:** | **CyberSecurity** **Year: 2019** |
| **Module:** | **MSc Internship** |
| **Lecturer:** | **Mr Vikas Sahni** |
| **Submission Due Date:** | **12/12/2019** |
| **Project Title:** | **Detection of Phishing and Spam Emails Using Ensemble Technique** |
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# Configuration Manual

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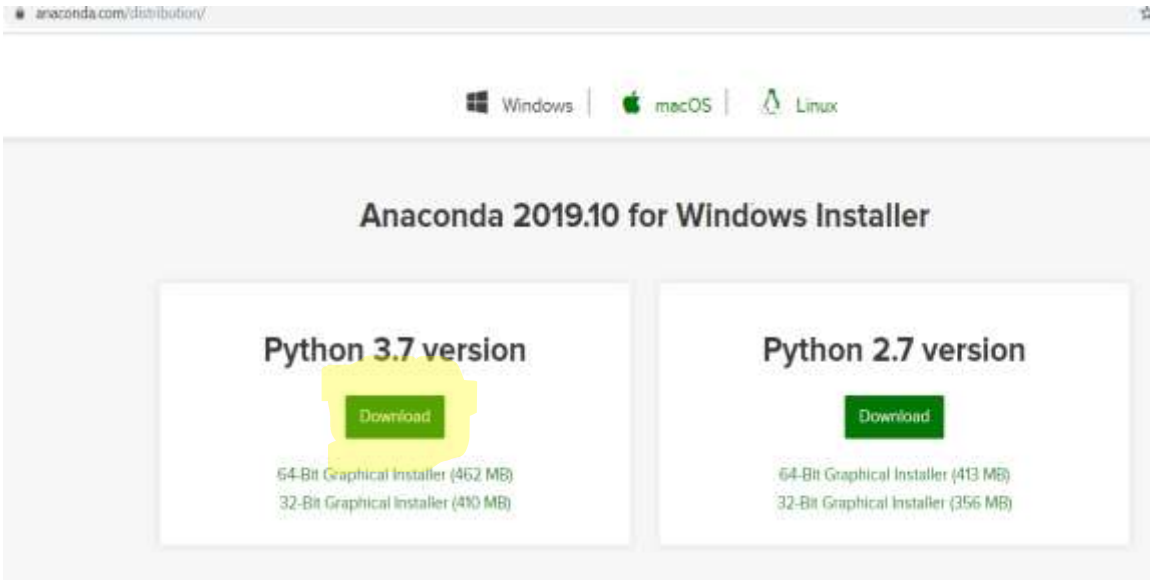
This configuration manual entails the tools capabilities and features used in the course of the project. It gives specific directions on the best replica of the experiment carried out.

The below steps shows how the installation is carried out on Windows Operating System.

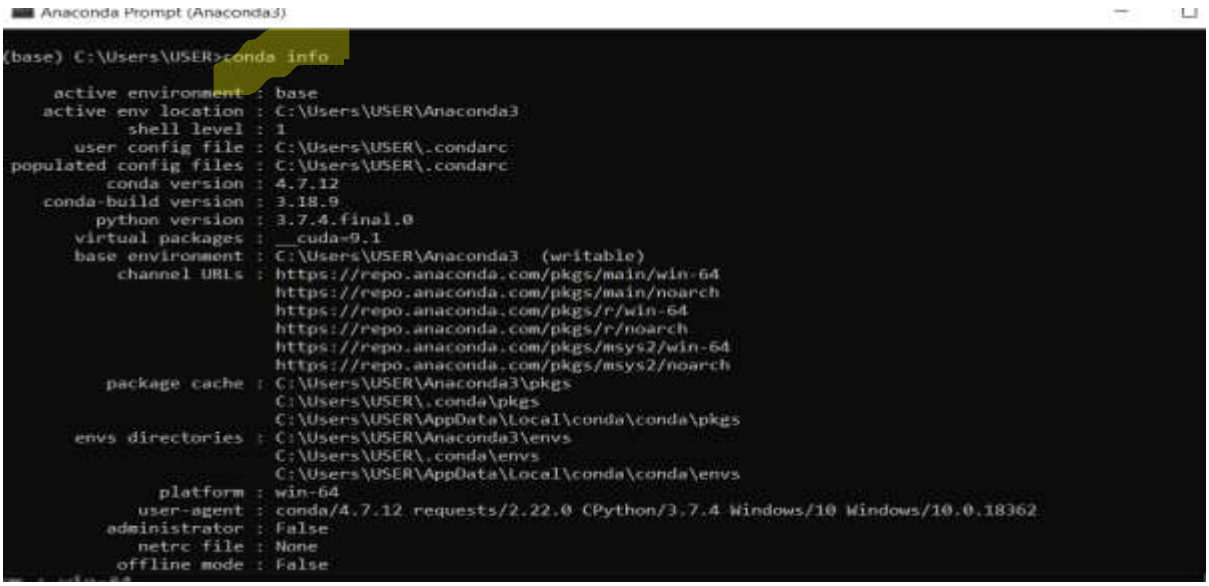
## 1 Installing Anaconda3

This section shows installation of Anaconda on an operating system of windows version 10. Anaconda3 is a designed package manager which is an open source for actualizing data analysis and machine learning project.

**Step 1:** Download the latest version of Anaconda installer with *https://anaconda.com/distribution*

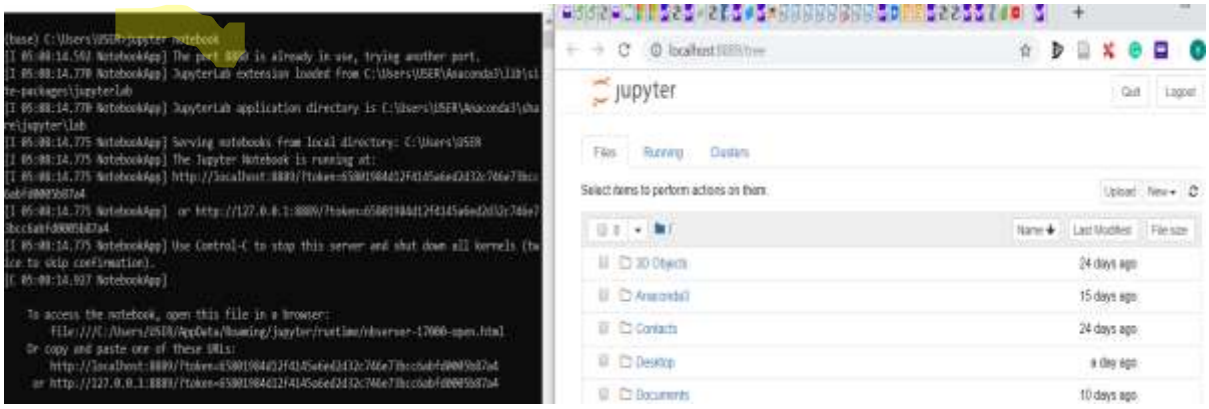


**Step 2:** After successful download, check the file integrity with the highlighted command to be sure that the download is right.




# 2 Jupyter Notebook IDE Installation using pip

**Step 1:** From the Anaconda prompt, run Jupyter notebook




# 3 Importing and Extraction of dataset

**Step 1:** Import necessary python libraries for dataset preprocessing

```
# Necessary Python Libraries
import pprint, os, re, email, csv
from bs4 import BeautifulSoup
from collections import Counter
from urllib.parse import urlparse
from IPy import IP
```

**Step 2:** Download dataset from the site as follows; (https://monkey.org/~jose/phishing/) and Spam Dataset (https://spamassassin.apache.org/old/publiccorpus/) and get path to spam, easy_ham, test_emails, and phishing from the Dataset imported.

```
spam_path = "C:\\Users\\USER\\Desktop\\phispam\\phish-spamming-detection\\datasets\\spam"
easy_ham_path = "C:\\Users\\USER\Desktop\\phispam\\phish-spamming-detection\\datasets\\easy_ham"
test_path = "C:\\Users\\USER\\Desktop\\phispam\\phish-spamming-detection\\datasets\\test_emails"
phishing_2017_path = "C:\\Users\\USER\Desktop\\phispam\\phish-spamming-detection\\datasets\\phishing\\phishing_2017"
phishing_2018_path = "C:\\Users\\USER\Desktop\\phispam\\phish-spamming-detection\\datasets\\phishing\\phishing_2018"
```

**Step 3:** Extracting all the 40 features from the dataset

```
def overall_feature_extraction(path, label, mail):
    necessary_fields = extract_necessary_fields(path, mail)
```

**Step 4:** Extract features of all mails in all paths and create a csv with the target attribute 'labels'

```
# Paths and corresponding labels
all_paths_labels = {spam_path : "Spam",
                    easy_ham_path : "Ham",
                    phishing_2017_path : "Phishing",
                    phishing_2018_path : "Phishing"}
pprint.pprint(all_paths_labels, width = 1)

# Datasets used in the paper
datasets = ["final_dataset_HamSpam", "final_dataset_HamPhishing", "final_dataset_HamSpamPhishing"]
```

**Step 5:** After successful feature extraction and dataset creation

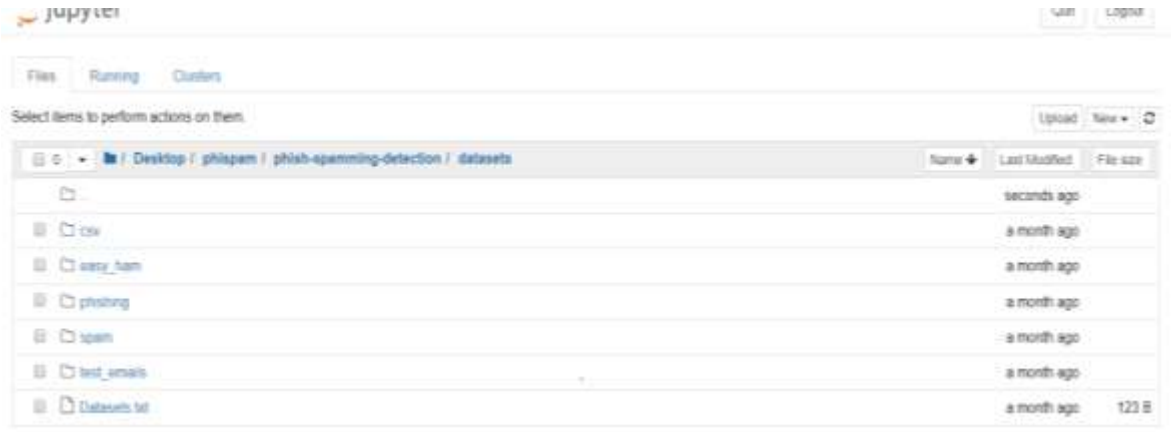
```
create_features_csv: success
extract_features_into_csv: success
dataset_creation: success
```

# 4 Analysis of dataset

**Step 1:** The below codes show the imported libraries in Jupyter notebook for analysis

```
In [1]: %matplotlib inline

import matplotlib.pyplot as plt
plt.style.use('ggplot')

import numpy as np
import os, math, sys
from collections import Counter
from IPython.display import display
import subprocess
import pandas as pd
from itertools import groupby
from operator import itemgetter
import timeit
```

**Step 2:** Insert easy_ham, phishing, spam and test_email files in the same folder, run the preprocessing files to download three csv files; which are test, final_dataset_HamPhishing, final_dataset_HamSpam, and final_dataset_HamSpamPhishing.




**Step 3:** Find below the view of our preprocessing and data analysis files in Jupyter notebook.

# 5 Read File and Sklearn Configuration

**Step 1:** Specify the directory that files are located and read **final_dataset_HamSpamPhishing** file only

```
csv_directory = "C:\\Users\\USER\\Desktop\\phispam\\phish-spamming-detection\\datasets\\csv\\"
files = ['final_dataset_HamPhishing', 'final_dataset_HamSpam', 'final_dataset_HamSpamPhishing']
```

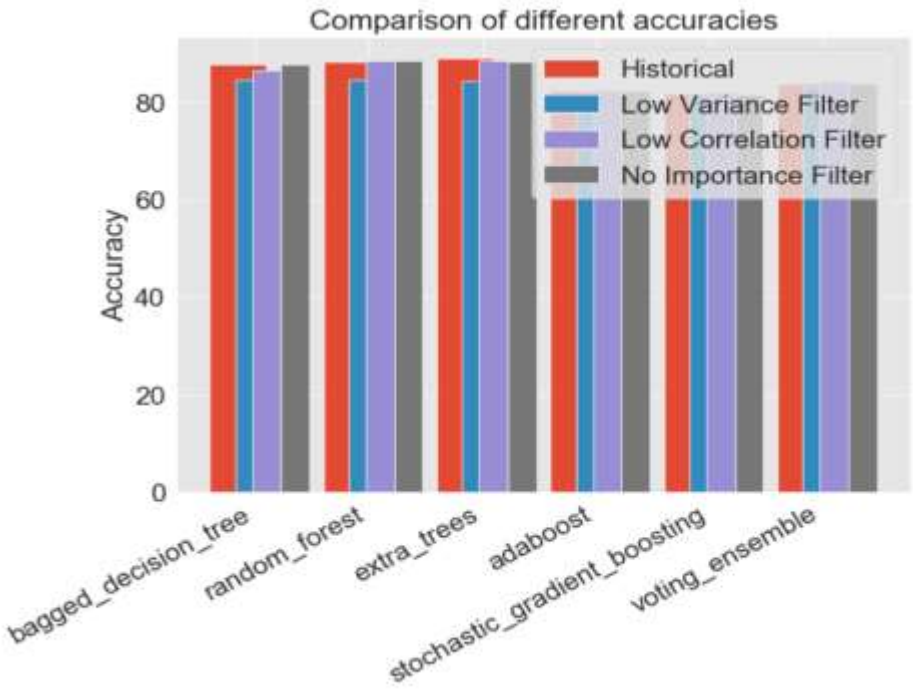
**Step 2:** Additional command to read head and tail of final dataset

```
global df
def get_data(filename):
    filename = csv_directory + filename + '.csv'
    df = pd.read_csv(filename)
    return df

filename = files[2]
df = get_data(filename)
display(df.head())
display(df.tail())
```

**Step 3:** Import all the algorithm from Sklearn

```
from sklearn import model_selection

from sklearn.ensemble import BaggingClassifier
from sklearn.tree import DecisionTreeClassifier
from sklearn.ensemble import RandomForestClassifier
from sklearn.ensemble import ExtraTreesClassifier

from sklearn.ensemble import AdaBoostClassifier
from sklearn.ensemble import GradientBoostingClassifier

from sklearn.svm import SVC
from sklearn.ensemble import VotingClassifier

from sklearn import metrics
from sklearn.naive_bayes import GaussianNB
from sklearn.discriminant_analysis import LinearDiscriminantAnalysis
```

**Step 4:** Knowledge chart of the classification model




# References

[1] https://docs.anaconda.com/anaconda-enterprise-4/ae-and-nav/

[2] https://scikit-learn.org/stable/install.html#installing-the-latest-release