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MSc In Data Analytics CA2

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# Executive Summary

## Introduction

This project is an integrated assessment used for analysing a large dataset derived from the Twitter API named “ProjectTweets.csv”. The dataset comprises od 1,600,00.0 tweets, and the primary objective was to investigate the sentiment shift over the recorded time period. A time series forecast was mandated fir projecting the sentiment across 1 week, 1 month, and 3 months into the future. The forecast results representation in a dynamic dashboard.

## Dataset Description

The Twitter dataset comprises of five key attributes: ”ids” (tweet ID), “date” (tweet date), “flag” (query status), “user” (tweeting user), and “text” (tweet content).

# Data Storage and Cleaning

## Dataset Storage

The dataset “ProjectTweets.csv” was stored into the Hadoop Distributed File System (HDFS), a reliable and scalable storage system designed to span across multiple clusters of commodity hardware (Databricks, 2023). The storage procedure followed these key steps:

* HDFS Initialization: Using the command “start-dfs.sh”, the HDFS was initialized. This command ensured all background processes have been successfully started and are currently active.
* YARN Initialization: The YARN (Yet Another Resource Negotiator) resource management platform was initiated using the “start-yarn.sh” command. YARN is very important for efficient resource allocation and task scheduling within Hadoop ecosystem.
* Dataset storage: The dataset was saved in HDFS using the command “-put” and using “user1” folder.
* Pyspark Integration: To facilitate data processing and analytics, Pyspark was used. Pyspark is an interface for Apache Spark in Python with powerful big data processing capabilities.
* Jupyter Notebook Access: The dataset analysis was executed using Jupyter notebook. By starting Pyspark, a Jupyter notebook was automatically launched and made accessible at the address “http://localhost:8889/notebooks/Downloads/Ca2.ipynb”

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Figure 2.1: Jupyter Notebook Access

In summary, the dataset was securely stored in HDFS. YARN together with Pyspark were then used to establish a robust analytical environment through the Jupiter notebook interface.

## Data Cleaning

The initial row of the dataset served as the header, which was preserved and saved under the name "header\_row". Subsequently, it was added back into the dataset with the header names being updated to: "index", "user\_id", "timestamp", "query", "username", and "tweet\_text".

### Timestamp Transformation

The dataset contained timestamps in the format "Mon Apr 06 22:19:45 PDT 2009". All timestamps were converted into a standard datetime format to support time series sentiment analysis. Using PySpark's in-built datetime functions, the timestamps were transformed into the format "2009-04-07 06:19:45"

# Reference

# Annexture

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Note: the total count includes section title, references etc.

Github project location: https://github.com/cuculicu/CA2-Second-semester