INF1002 Programming Fundamentals

Data Analyzers

Python Team Project Specification

AY2022/2023 Trimester 1

Objective

Python has become one of the most popular programming languages in a lot of application scenarios such as the data crawling, scripting, data analytics, machine learning and Artificial Intelligence. Thus, the objective of this project is to allow you to develop a Python program such that you can:

1. Apply and familiarize the knowledge learnt from the class
2. Learn more new Python programming skills through self-learning to deepen your skills
3. Learn team collaboration using Python tools and libraries
4. Gain more hands-on experience in solving a real-world problem using Python

The Detail Requirements

Data has become the new oil for now and the future. Most of, if not all, the industries have heavily relied on data to strategize their business. They have been collecting and generating a large amount of data from different resources. However, data is useless without analyzing them. Therefore, companies have invested a lot of resources and manpower to analyze the data and derive the insight that help them better understand what is happening and predict what will likely happen. The insight derived from the data analysis has empowered the companies to make more intelligent decision and strategic planning. Many startup companies have also relied on data analytics to provide data-driven innovations for their customers. And Python has become the most popular tool used in industry to drive this movement. Therefore, in this project, your team will have opportunities to develop innovative and intelligent tools based on data using Python.

Consider the backgrounds of the students are diverse. To make sure that the project maximumly benefit to everyone, we are allowed to choose different topics and applications for your project.

The overall instructions for every team to follow is provided as follows.

1. Figure out one interesting and innovative application scenario where data can help make a difference. Then you need to search for the corresponding datasets that can support your application. In a separate file, we will provide you some sample project ideas and datasets. But *you are free and encouraged* to come out with your own applications and ideas in your project.
2. Develop the proper data parser and cleaner to extract the proper information from the data you have.
3. Build your own story about how to make sense of the datasets and perform some meaningful analytics with different visualization or user interfaces.
4. Provide some evaluations and comparisons if needed.

In particular, your system shall allow users to perform some basic features shown as below:

- Read data from an external data sources, e.g. txt, Jason, excel or other formats.
- Allow users to view the datasets.
- Allow users to search the data based on some criterion.
- Allow users to see some statistics information based on the data.

- Allow users to export some of the results.
- As some advanced features, you need to perform some complex analysis on the data you have, such as pattern/anomaly detection, sentiment analysis, topic detection, regression analysis, prediction or other analyses using advanced data science libraries like machine learning libraries. The advanced features may vary based on the project you are working on.
- You have to perform some detailed result analysis and try to provide some meaningful insight by analyzing the data. In your report, you have to proper document your approach, the experiment done, and results.

Note that based on the applications chosen, your program may include all or part of the features listed above. You need to design one user-friendly UI such that your program is easy to use. As one example, the program should be able to allow users to choose which function to perform and display the result nicely. You can build any innovative UI. Note that it is not compulsory to build a GUI. However, building one GUI will be considered as one of the advanced features of your program. We will provide you some project ideas for you to select. If you wish to propose your own project idea, please let your lab instructors or A/Prof. Daniel Wang know and seek the approval of your project ideas. If you need any help on your project, please approach to your lab instructors.