Design and Analysis of Software Systems – Sprint 2024

Assignment 1 – Python

Due Date: 08 February 2024, 8.00 PM

Instructions:

- This assignment is an individual submission.
- Total Marks of 50 Marks for 3 weeks.
- All script submissions should be submitted via Moodle.
- Inputs/output should fit the criteria mentioned in respective question.
- All other conditions are open to your interpretations.
- Try applying Object-Oriented concepts wherever possible.
- Evaluation will be conducted based on a fixed grading rubric (syntax, logic, input, and output) and the marks are divided as per prescribed weightage in respective questions.
- For queries, reach out to TAs via Moodle.

Q1: Build "Marks Directory" for Faculty in Python. Here, a directory consists of a list of entries. Each entry can store details such as First Name, Last Name, Roll Number, Course Name, Semester, Exam Type, Total Marks and Scored Marks. To maintain a Marks directory, the following functionalities are required. **(15 Marks)**

1. A Faculty should be able to add new entry from command prompt.
2. Consider reading/loading marks entries from .csv file too.
3. Display the marks directory on terminal (in a table-like format).
4. Allow removing and updating entries in the Marks directory.
5. Search for entries in the directory based on some attribute(s) (your choice of search)

Sample Data Entry (Input):

First Name	Last Name	Roll Number	Course Name	Semester	Exam Type	Total Marks	Scored Marks
Sai Anirudh	Karre	20112153	Software Engineering	Monsoon2021	Assignment 1	50	35
Sai Anirudh	Karre	20112153	Software Engineering	Monsoon 2021	Final Exam	100	58
Sachin	Tendulkar	2015896	Intro to Database Systems	Spring 2023	Class Test	10	9

Q2: Person P is at location S and moves around in the 2D world based on sequence of input commands. You can consider S as any coordinate. Take user or file input for sequence of commands. For example, [(3mm, N), (4.5mm, NW), (2mm, SE)] is one such example of sequence of commands. It says that P moves for 3 milli-meters in N direction from the current location. Next, P moves 4.5 mm in NW and so on. Here, N, S, W, E are North, South, West and East, respectively. Length can be taken in milli-meters or centi-meters. **(20 Marks)**

- Show a 2D plot that describes how P is moving in 2D world starting from S. Use library like Matplotlib in Python.
- Interpret the current/last location of P with respect to the starting point S. (Example: North/North-East of S)
- Calculate the total distance from the starting point S to the current/last location.

Q3: Build a **kaooa** board game in python using following resources. You may use Python libraries like Turtle etc. Following are few references about this board game. **(15 marks)**

- https://www.whatdowedoallday.com/kaooa/
- https://www.youtube.com/watch?v=Jzeug1XTRQM

Submission Guidelines:

- Create three files, one for each question (Q1: mdirectory.py; Q2: map.py; Q3: kaooa.py). The code can be divided into modules, but your submission must be executable from these files for each question.
- Create one readme file called readme.txt that include steps to execute your code, input of each script around each step and the outputs generated by your own scripts,
- Add all the files in a directory named <rollnumber> and zip the contents as <rollnumber>.zip
- If and only if the size of your submission is more than 20 MB, please check-in your assignment submission in github and provide us the repository URL in readme.txt. ZIP the readme.txt in <rollnumber>.zip

P.S.: Use of Code Assist tools and GENERATIVE AI is not permitted.