DEPARTMENT OF COMPUTER & INFORMATION SYSTEMS ENGINEERING
BACHELORS IN COMPUTER SYSTEMS ENGINEERING

Course Code: CS-115
Course Title: Computer Programming
Complex Engineering Problem
FE Batch 2024, Fall Semester 2024
TERM PROJECT

Term Project Title:
SIMPLE DATABASE MANAGEMENT SYSTEM (DBMS)

Project Overview:
The objective of this project is to develop a simplified database management system (DBMS) using Python. Students will create a system that allows users to define custom databases with variable fields and associated field lengths. The DBMS will enable users to add, delete, edit, view and search records within the created databases.

Key Requirements:
1. Database Creation:
   - The user should be able to create a new database by specifying field names and their corresponding maximum lengths.
   - Two files will be created for each database:
     - System file: Stores the names of fields and their lengths.
     - Data file: Stores the actual records in a structured format.
2. Data Manipulation:
   - The system should allow the user to open any database from the already existing databases.
   - The system must provide the following operations on the opened database:
     - Add a record: Allow users to input data for each field, ensuring it does not exceed the specified field length.
     - Edit a record: Provide functionality to modify an existing record.
     - Delete a record: Enable users to remove records from the database.
     - Display all records: Enable users to view all records from the database.
     - Display a selected record: Enable users to view a selected record from the database.
3. User Interface:
   - A user friendly, command-line interface (CLI) should be implemented for interacting with the DBMS, guiding the user through the database creation and data manipulation processes.

Design Hints:
1. Finalize the user interface for your application.
2. Choose data structures/objects to keep and organize the information when your application is running.
3. Decide on information that needs to be stored in files. Also decide naming conventions for files.
4. Divide the code into modules and functions for easy distribution of tasks among the group members.

Some Extension Ideas:
1. Allow user to set controlled access through username and password for a database.
2. Display some statistical results for a database. This could be as simple as overall statistics on the database like number of records, number of fields etc; or these could be advanced level features like mean, standard deviation, etc on numeric fields, or graphical representation of numeric fields.
3. Use GUI to improve interface and/or display products.
4. Make web interface for the application.