King Fahd University of Petroleum & Minerals
College of Computer Sciences and Engineering
Information and Computer Science Department

ICS 104 Lab Project

Title: KFUPM Restaurant Management System Upgrade

We aim to upgrade the current restaurant management system at King Fahd University of Petroleum and Minerals (KFUPM), KSA, to enhance efficiency and customer satisfaction. The current system has several issues, including long queues during peak hours, food shortages, and a lack of student preferences for weekly meals.

The Enhanced Restaurant Management System with User Authentication is a Python-based application. The system will include advanced features such as advance daily food preferences, payment at the end of the month from bank accounts, and offering food based on students' preferences. Additionally, the system will implement a user authentication system for three types of users: Student, Restaurant Manager, and Admin. Each user will have to log in using their ID and password stored in three different files **(STUDENT.txt, MANAGER.txt, ADMINISTER.txt**). For authentication, use the provided files attached to the project folder.

Specifications:

1. **User Authentication:** The system will support three types of users*:* *Student, Restaurant Manager, and Admin*. Each user will have to log in using their ID and password stored in the respective files (**STUDENT.txt, MANAGER.txt, ADMINISTER.txt**).
2. **Advance Daily Food Preferences:** *Students* will be able to request their daily (for specific date) food preferences in advance, allowing the restaurant to plan and prepare accordingly. The list of available food items is in **FOODITEMS.txt** file containing three column Item No, Name and Unit Price (in SAR). Firstly, the system will ask the student to provide the date for the meal. After demonstrating the food items from FOODITEMS.txt file, it will ask for the number of items.

Finally, students will food items' serial and the quantity (as 2 1) separated by newline. It will automatically update the **PAYMENT.txt** file when any student submits new order.

3. **Payment at the End of the Month:** A file will be created (**PAYMENT.txt**) containing student ID and their payment dues based on the food preferences they submitted for each day. The amount will be updated if any student submits new preferences. A payment system will be implemented where students will provide their bank account and password (same password for login) to pay for meals at the end of the month, reducing queues at the counter. A file (**STUDENTBANK.txt**) will store the bank details (ID, BANK ACCOUNT) to verify their information. Assumption: If a student submits his preference for a specific date, he/she must have to pay for it.
4. **Offer Food Based on Students' Preferences:** The system will utilize data from students' preferences to offer food items that are more in demand, reducing food shortages and ensuring student satisfaction. A new file will be created (**FOODDEMAND.txt**) for each date containing a list of food items and their amount for a specific date. This option will be available for *MANAGER* only.
5. **Add, Update and Delete Information:** The *ADMIN* will be able to add new students and managers to the existing files (STUDENT.txt and MANAGER.txt). Moreover, admin can update specific information (one, two or all columns) for specific user (STUDENT/MANAGER). Additionally, admin can delete any users. Admin can also add, update and delete food items from **FOODITEMS.txt** file.

Important instructions:

The lab project will be done by teams of 2 students.

The students should be informed about the following items: (**All the part below should be posted to your students)**

- Comments are important, they are worth (worth 5%)
- The code must use meaningful variable names and modular programming (worth 10%)
- Global variables are not allowed. Students should learn how to pass parameters to functions and receive results.

- Students must submit a working program. Non-working parts can be submitted separately. If a team submits a non-working program, it loses 20% of the grade.
- User input must be validated by the program i.e. valid range and valid type
- Lab project is limited to the material covered in the labs and lectures.

The deadline for submitting the lab project is **Saturday May 11 before midnight**.
Submitting Sunday before midnight will lead to 5% penalty
Submitting Monday before midnight 15% penalty

Deliverable:
Each team has to submit:

- The code as a Jupyter notebook
- The report as part of the Jupyter notebook or as a separate word file. The report will describe how they solved the problem. In addition, they need to describe the different functions with their task and screen shots of their running code. (worth 5%)

Lab demo/presentation:

- **The week of May 12-16** will be used for lab project presentations. You need to arrange for your students presentations via MS Teams or physically.
- A slot of 15 minutes will be allocated to each team for their presentation and questions
- Students who do not appear for lab demo/presentation will get 0.

20% of the grade are highlighted above. The remaining 80% will be on the code itself and presentation.