CS4013 Software Development Project
University of Limerick
Michael.English@ul.ie

Objectives:

- Apply an object-oriented approach to the design and development of a small software application.
- Apply the concepts and techniques introduced in lectures, tutorials and labs to the design and development of a small software application.

System Requirements:

Congratulations! Your software company BestSolutions Ltd has won the contract to develop a new hotel reservation system for the L4 chain of hotels. At present the chain consists of a 5-star, 4-star and 3-star hotel but the chain may expand or contract in the future. Each hotel has a few room types. The hotel and room info, including room rates are included in the file l4Hotels.csv which is also available online. The reservation system needs to handle reservations, cancellations, hotel stays and billing/accounts.

The most fundamental functionality that is required in this system is that of making a room reservation. A hotel will have several rooms available each day. A reservation enquiry has a check-in date and a check-out date. A reservation can only be successfully made if the number of room(s) requested are available on all the dates from the check-in date up to, but not including the check-out date. A successful reservation must be stored in a comma separated value (csv) file called reservations.csv

A reservation can be either a standard reservation (S) or an advance purchase reservation (AP). A 5% discount applies to all AP reservations.
The cancellation policy is as follows:
Advance purchase reservations are non-refundable. For a standard reservation, the full booking value will be charged if the cancellation is received within 48 hours of check-in or if the booking is a 'no-show'. A standard reservation is fully refundable if cancelled more than 48 hours before the check-in date.

The following is the type of information that should be recorded for a reservation:

- Reservation number
- Reservation name
- Reservation type (S/AP)
- Check-in date
- Check-out date
- Number of rooms
- For each room
    - Room type
    - Occupancy (number of persons)
- Total cost

The L4 hotel group requires that the details of all charged hotel reservations be maintained on the system (in csv files). This information must be stored for at least 7 years for tax and audit purposes.

One of the main reasons that BestSolutions won the tender for this contract was that it proposed to provide some analysis on the hotel reservations and billing data for the L4 hotels. This analysis will provide L4 hotels with the ability to better assess their current offerings, including room prices and to tailor special packages in the future. This data analysis should provide occupancy figures/rates for each of the hotels and room type over a specific period of time (i.e. given a start date and end date). In addition, the billing/accounts data analysis should calculate the income for each of the hotels over a specific period of time (i.e. given a start date and end date).

The details of the l4 hotels are available in the attached l4Hotels.csv file. This can be viewed in a text editor or via a spreadsheet application (MS Excel). This file has information for each hotel, including room type, minimum and maximum occupancy for each room and the price for each room for each night of the week.

A text-based interface is a minimum requirement for the system. The text-based interface should use System.out and System.in and does not include the use of JOptionPane.

You must use a GitHub repository for this project. This must be the main repository for source code and team members are expected to contribution regularly to this repository. Documents should be checked out of the repository when being edited and should be checked in when changes have been applied. All document changes should be reflected in the repository.

A graphical user interface can be included if all other functionality is fully completed, and the target is a maximum grade.

Project Deliverables

This project must be implemented in the Java programming language. As can be seen from the deliverables below this project is not just an implementation project, it also involves design and documentation.

The following are the deliverables for the project:

- A document outlining the Class Responsibility Collaboration (CRC) cards and a UML diagram showing the relationships between the classes. These can be created in a word document. The UML Diagram only needs to include the class names (You don't need to include data fields and method details).
- Documentation for the software generated using the javadoc utility.
- A help file describing how to compile and run the application **from the command line**. During the project interview, the system will be compiled and tested from the command line. Ensure your project compiles and runs from the command line. Also, please ensure that instructions for compilation and execution

are accurate and tailored to the command line interface. **The help file should also contain a link to the project repository on GitHub**,
- The source code for the system where each Java class is stored in a separate file.
- The csv files that you populate and use and are required by the system should also be included. These files must have data already included. It is in fact an advantage to include these files with data in them as you should be using this data to test the application yourself. Ensure that reasonable, sensible, and appropriate data is included in these files.

Rules and Regulations

- **You must undertake this assignment on a group basis (maximum and normal number per group is 4 students)**. If you can form a group of 5 or 6 then split this group into two groups and accept new team members who do not already have a group. Any groups with less than four students must accept new team members. For example, if there are two groups or more of 2 students then these groups will be merged to form groups of four.
- Everyone must submit your details to the following file by Thursday 28/10/2022, even if you don't have a group or have a group with less than four. Leave a blank row on the spreadsheet between each group/individual details. Her is the link to the file: https://ulcampus-my.sharepoint.com/:x:/g/personal/michael_english_ul_ie/EX1-BUuq4QtPhIAbN2L8bKkBP2dnv_nvNKDZFogSiTKPXQ?e=JBZS4W
- You will be required attend a group project interview, to give a code walkthrough and demo at a selected time from the start of week 13 to the end of the examination period. It is your responsibility to prepare adequately for such a demonstration and to be knowledgeable about the design, implementation and documentation submitted (as well as about the concepts from this module in general). The time for each interview is limited. Failure to satisfactorily demonstrate your project will result in an F grade for the assignment irrespective of the contents of the submitted documentation. An unsatisfactory demonstration is also likely to be considered plagiarism. It is also your responsibility to ensure that other students do not submit any part of your work as part of their project. This will also be deemed as plagiarism**. Plagiarism will result in 0% being awarded for all in-term assessments in CS4013 and the University Code of Conduct will be applied.**
- The contributions of each team member must be clearly outlined in a document called 'contributions.xlsx'(template available shortly on Sulis). This document must be agreed by all team members. Each team member's overall contribution to the design, documentation, implementation and testing must be stated. In addition, the author of each class and method must be specified, along with the authors of the design and documentation. Each team member is expected to contribute relatively equally to each part of the project (design, documentation, implementation and testing). Marks will be awarded on an individual basis and will be impacted by the contributions of each team member.

- The project must be submitted as a single compressed file to Sulis by the stated deadline. Submission deadline is **12h00 Monday Week 13. A penalty of 10% per day** thereafter will be imposed for late submissions. **Late submissions can be uploaded to Sulis until 12h00 Thursday Week 13.**
- Accidental loss of work will not be accepted as an excuse.

Project Grade Target Guidelines:

The following are general guidelines to help you to form groups with classmates that are aiming for a similar target grade. These targets are just guidelines and are not necessarily part of the marking scheme of the project.

- A-grade: Complete well-designed solution with all functionality and documentation including multiple user types, text-based user interface and graphical user interface and with evidence of extensive testing.
- B-grade: Well-designed solution that may not include graphical user interface but includes other functionality, testing, documentation etc..
- C-grade: A solution that follows good fundamental design processes. It should have a text-based interface, facilitate the reservation of a room (and in doing so check availability for all the dates of the reservation. There should be evidence of testing and the documentation requested should be included.
- D-grade or lower: Does not achieve the minimum standard for a C-grade or does not meet some of the other basic requirements outlined in this document.