Section 2: Task Specification

All the tasks are based on the following scenario. Please read carefully all information contained within the following passage of text.

Horizon Cinemas Booking System (HCBS)

The Horizon Cinemas (HC) is a successful chain of cinemas in Birmingham, Bristol, Cardiff and London. Each city has at least two cinemas at different locations. HC is looking for an IT solution to manage screening of films and ticket booking system with the objective to make it convenient for customers to book tickets when they visit a cinema booking office.

Each cinema has up to 6 screens and each screen runs between one to four daily shows of a selected film. Film listings, show times and prices may vary from one cinema to another. Seating capacity for each screen varies between 50 to 120. For each screen, seat(s) can be reserved in lower hall or in upper gallery. The following table indicates standard price range for lower hall type tickets for different shows/listings at different times of the day.

Table: Price range for lower hall

	Morning Show (between 8am – noon)	Afternoon Shows (From noon – 1700)	Evening Shows (From 1700 – midnight)
Birmingham	£5	£6	£7
Bristol	£6	£7	£8
Cardiff	£5	£6	£7
London	£10	£11	£12

Typically, lower halls have about 30% of total seats. The ticket price for upper gallery is 20% higher than the lower hall. Upper gallery also offers up to 10 VIP seats at 20% higher price. For example,
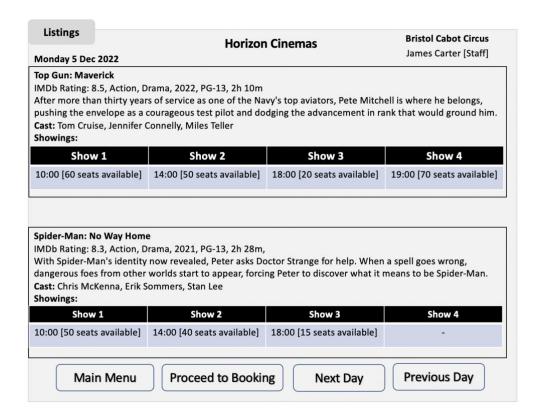
If lower hall price is £10 per ticket, then VIP ticket price would be (£10 + (£10 x 20%)) x 20% = £14.40.

Tickets can also be booked for up to one week in advance. Tickets can be cancelled at least one day prior to film show at 50% cancellation charges. No ticket cancellation allowed on the day of show.

System has three types of users: Booking staff, Admins and Managers.

The system has the following Graphical User Interfaces (GUIs) needs. Please keep it simple and be creative by using labels, text boxes, radio buttons, check boxes, menus, drop-down lists, window tabs, buttons, data tables etc.:

1. **Film Listing:** films with description and actors' details, film genre and age, rating, show times, etc. The following figure depicts an example of how data should look like but be creative and use different GUI widget as you see appropriate:

4

2. **Booking:** System should allow to fill a booking form that will provide option to check seats availability and total tickets price for a selected date, showing and type of tickets. Booking reference should be unique for each booking. Booking receipt should include Booking reference, Film name, Film date, Showing time, Screen #, Number of tickets, seat numbers, Total booking cost and Booking date. The following figure depicts an example of booking form but be creative and use different GUI widget as you see appropriate:

Only admins can select listings from other HC cinemas and make booking on behalf of customers. <u>Note:</u> You are NOT required to provide a payment mechanism for your system, though you may simulate this.

3. **Cancellation:** There should be an option to cancel booking. There is no cancellation or refund for missed shows.

Managers, Admins and Booking staff can access Film listing, booking and cancellation GUIs/views.

4. **Admin view:** Admin view to manage screening of films. They can ==add==, ==update== and ==remove listings== e.g., add new films, remove film, update show times, attach shows to screen/hall, etc. They can also ==generate admin reports== e.g., ==number of bookings for each listing, total monthly revenue for each cinema, top revenue generating film, monthly list of staff making number of bookings in sorted order==, etc.

Admins and Managers can access Admin GUI/view.

5. **Manager view:** HC also expects to expand their business in existing or new cities in near future and would like their IT solution to allow adding new cinemas. Manager view allows to ==add new cinemas and listings in existing or new cities==. These new cinemas then become available for booking by booking staff.

Only Managers can access Manager GUI/view.

You should also consider other suitable non-functional requirements (e.g., security measures) necessary for the HC booking system. Be creative.

You are the leader of a team of three developers who have been asked to design and implement a system which enables the Managers, Admins and Booking Staff to schedule listings and booking activities and keep track of the cinemas, films, screens and bookings in a simpler and easier way, enforcing the rules described above.

More specifically there are following tasks:

You are asked to produce the following deliverables for the scenario given above.

Part-I (Weightage 40%)
Task 1. Produce a use case diagram to capture the functionality for the system to be built.
Task 2. Produce a class diagram to meet all the requirements captured in the use case diagram.
Task 3. Produce at least three sequence diagrams for some use cases that adds information.

Part-II (Weightage 60%)
Task 4. Write a joint report (300-700 words) outlining the steps that you followed to develop the system in relation to an Agile development episode and justify your choices. You should consider benefits and challenges faced and may consider the following steps:
- **Strategy planning:** This is the initial phase for our system development process where we as developers need to identify system users to avoid building wrong solution and identify role and responsibilities of each team member………

- **Continuous team iterations:** The development phases of our project are more flexible as we continuously iterate between planning and implementation compare to conventional development methodology which is too rigid and strict……

- **Team coordination and communication:** The essence of our project is effective coordination and communication among members either through face-to-face or online conversation…….

- **Simplicity:** Our main objective is to practice simplicity which is important for the system to avoid the structure being too complicated……

- **Work Plan (Not mandatory but if they can produce would be good):** Project Backlog, SPRINT Cycle

Task 5. Develop the system using a suitable Object Oriented Programming language (e.g., Python as we'll use Python programming language for this module) and Database(s) considering all the functionalities described above.
- You should design and implement suitable database(s) and <u>fill it with suitable mock data for testing and demonstration</u>.

- You should be creative and come up with your own User Interface Design for different abovementioned GUI needs.

- You should also implement non-functional requirements (e.g., security measures) to a good standard.

Task 6: Testing is typically a part of the program development - You should use a test strategy to test your system thoroughly. You should identify all the suitable test cases for all the classes implemented. When you test your code, you should make sure that your program does not allow bad data to be stored into your objects. Deliberately feed in your program out of range or wrong data and try to make it fail, see if you can swipe bad values into the member variables. One example test case shown below.

Test Case #	Description	Test dataset/Input	Expected output	Actual output
1	Booking staff is able to get price and book five tickets for a selected listing and date	Selecting film from listing on a specific date and time, ticket type, and quantity	Shows seats availability and total price	As expected [Pass/Fail]

Task 7: Individual Contribution and Reflective Report (300-700 word). Your report should include:
      (a) the evidence of your work produced for the above activity with an outline;
      (b) reflection on your contribution to the work in relation to skills and knowledge acquired.
      (c) provide brief reflection on other suitable emerging technologies and/or methods which could be used for designing and implementation of this system.

Your lab tutor will play role of representative of HC. If you have questions about this assignment, please discuss with your lab tutors. You may also post questions for your lab tutors on the discussion board on Blackboard. You can find the discussion board from the front page of the module Blackboard pages and use the forum under the title "**Group project**".