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Date: 1/23/2024  
Week: 2 - Create an Analysis Model for a Small Bed & Breakfast Reservation System

1)  
Rubric Criteria:  
Create UML use case diagram of 3-7 use cases 10%  
Your Response:

A diagram of a hotel reservation system

Description automatically generated

2)  
Rubric Criteria:  
Write use case sequence of events for each use case in the use case diagram 20%  
Your Response:

1. John and Jane log into the system
2. They make sure room description and pricing is up to date
3. John/Jane view the customer information such as payment history to see if they made their deposit for a reservation.
4. Drop reservation if customer information displays that a payment was not guaranteed in time.
5. Customer calls 🡪 John and Jane view vacancies
6. John and Jane add reservation when the customer requests an open room.
7. Manage customer information by adding the customers information to the system along with their reservation information
8. Manage payment to confirm payment to guarantee the reservation or give refund if the customer is cancelling the reservation/if the payment is not guaranteed.

3)  
Rubric Criteria:  
Explain approach, steps, and rationale of the use case model 25%  
Your Response:

To come up with the content of the use case diagram, I broke down the information from the development requirements into smaller pieces. I deducted first who the user/users would be, in this case it is John and Jane only since they do not want customers making their own reservations. Then, I thought about what use cases I might need. What information do they need in a reservation system? I created the sequence of events to help brainstorm the different use cases and I used our learning resource of the week on use case diagram to help guide my thought process.

Here was my approach and rationale for each use case in the diagram:

* Customer information would need to be included to store the demographics mentioned in the software development requirements.
* I found it logical to include the ability to manage room listings.
  + This included a use case of updating price and description.
* Viewing vacancies was an obvious need as it is part of the requirement before John and Jane could drop or add a reservation.
* Add reservation and drop reservation, I kept as separate use cases because they required different actions.
  + Both extend into a use case of managing payments from a customer since dropping a reservation may include a refund (the requirements did not state so, but I made the assumption that it’s a possibility) or a payment to guarantee a reservation

Once I came up with the logic, I created the diagram using draw.io with John and Jane being the only actor in this scenario.

4)  
Rubric Criteria:  
Create UML class diagram 10%  
Your Response:A diagram of a customer

Description automatically generated

5)  
Rubric Criteria:  
Explain approach, steps, and rationale of the class diagram model 25%  
Your Response:

This part was more challenging than I had expected. I have created many class diagrams before, but most of the time, I created the diagrams after writing a whole program so thinking of one before writing out my program was difficult.

To get this started, I first came up with a class called Reservation which would hold all information about a reservation including whether or not it is guaranteed and processing a payment. I added a start and end date for the reservation to make it easier for John and Jane to check the calendar for vacancies of a room. It also has a method to drop the reservation if the guarantee is not met. I then added a Customer class which contained all needed information about the customer which will be stored in a Reservation. Having this class helped me organize elements better and not have the Reservation class be unnecessarily long with elements. After that, I created a class called Room which stored the Room information that was to be stored each Reservation. I ended up also creating a Payment class to help process a payment made by a customer for a reservation.

To process and manage all the reservation information, I figured that John and Jane could possibly do this all from the Calendar class kind of like a calendar system. They can create and drop a reservation if a customer calls them. It checks the availability of a reservation by comparing start and end dates of a pre-existing reservation if any and a new one. It would also consider room number since multiple rooms can be reserved on the same date range.

After creating the classes and filling them with elements and methods, I had to consider their relationships in order to connect them. Reservation somewhat serves as the heart of the system. Reservation contains a customer and room but can exist without a payment being made. A Calendar is made up of a list of reservations whether or not it is empty so it manages reservations. I used compositions for the relationships between Calendar-Reservation, Customer-Reservation, and Room-Reservation. I listed Payment-Reservation as an association because payment cannot really exist without a preexisting reservation but Reservation can exist without a payment being made (it will just eventually be deleted).

6)  
Rubric Criteria:  
Reflect on the learning experience and lessons learned 10%  
Your Response:

This assignment was certainly a challenge, since I have learned all this time about the actual programming of software. Programming itself can be challenging but so can the planning for it. It took me a while to get used to the concept of developing a use case diagram and a class diagram with a written description of requirements that do not include what classes and methods that need to be implemented. In previous experiences, I was given the needed classes and methods and members beforehand and I would just program them based on the requirements. In this situation, I had to come up with everything from scratch.

Even though it was a challenge, this was rewarding because I learned of the complexities and what it takes to develop software from the ground up. I also appreciated my deeper understanding of use case diagrams and class diagrams that came out of this assignment. The learning resources from the class also really helped this week with this assignment, but it helps me learn more by putting the theory to practice.