

**CE/CZ2002: Object-Oriented Design & Programming**

**Assignment**

**Group 4**

Building an OO Application

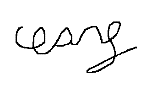
2017/2018 Semester

SCHOOL OF COMPUTER SCIENCE & ENGINEERING NANYANG TECHNOLOGICAL UNIVERSITY

**Declaration of Original Work for CE/CZ2002 Assignment**

We hereby declare that the attached group assignment has been researched, undertaken, completed and submitted as a collective effort by the group members listed below.

We have honoured the principles of academic integrity and have upheld Student Code of Academic Conduct in the completion of this work.

We understand that if plagiarism is found in the assignment, then lower marks or no marks will be awarded for the assessed work. In addition, disciplinary actions may be taken.

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1. Design Consideration and Use of OOP concepts

The very first step we take is identifying important classes for the system and group them into Entity Class, Control Class and Boundary Class.

We want to hide our implementation of methods from users and we do not want them to directly interact with the data files. So, we use Layered Architecture for our system (Refer to the class diagram). There will be total four layers, 1. Presentation layer, Business Layer, Persistent Layer and Database Layer. We put the main application interface class and other interface classes in the presentation layer, control classes in business layer, entity classes in persistent layer and the data text.files in the database layer. We have decided to use this architecture because

1. It increases flexibility and reusability. For example, if we want to update from CLI (Command Line Interface) to GUI (Graphical User Interface), we just need to update the main application interface class in the presentation layer. All other classes from other layers remain the same.
2. It also encourages extensibility and maintainability. Different layers can be independently updated, maintained and deployed.
3. It makes the system loosely coupled since the layers must communicate via top-down approach.
4. Use of OOP Design Principle
   1. Single Responsibility Principle

We make sure that every single class has only single responsibility. For example, Room Controller class has methods relating with rooms only. It cannot manipulate or does not have abilities to manipulate other unrelated classes like reservations and so on.

* 1. Open-Closed Principle

We implement this principle for Room class. Room class have “RoomType” attribute. That “RoomType” attribute is an interface. So, it we want to include more room types in the future, we do not need to change code of the Room class. We just need to add a new room type class realizing “RoomType” interface.

* 1. Interface Segregation Principle

All room type classes realizing the “RoomType” interface required all the methods declared in “RoomType” interface. There are no unnecessary methods inside “RoomType” interface.

1. Consideration for Future Extension (Sending reminder via SMS for a few days before reservation date)

For this extension, we can create a SMS controller class and SMS entity class. We can use the Observer design pattern here. In reservation controller, we can add a new method which will compare the date of the reservations with 3 days after local date and it will add reservation’s date and contact number to the list and return the list. Then SMS controller will call this method to get contact number and reservation date. Then there will be a method which creates SMS object with standard message, “Your reservation at Hotel will be expired at dd/mm/yyyy (reservation date)”. Then SMS controller will have another method which will send out this SMS object to users.

In this case, we can clearly see that we are not required to change any existing code inside our system to accommodate this new function.

|  |  |
| --- | --- |
| Test Cases | Result |
| Create a new room | |
| Room Type: Single Room  Room Number: 02-50  Bed Type: Single  Wifi-enabled: Yes  View: Sea View  Smoking allowed: Yes  Room Status: Vacant | You have successfully created the room!!! |
| Update room information | |
| Room number: 02-02  Update: Room status  Room status: Under Maintenance | You have successfully updated the room information!!! |
| Print room statistics | |
| Print room statistics | List of vacant room:  SINGLE: Number: 16 out of 21  Rooms: 02-03 | 02-06 | 02-07…  DOUBLE: Number: 8 out of 9  Rooms: 03-01 | 03-03 | 03-04…  DELUXE: Number: 6 out of 9  Rooms: 04-01 | 04-05 | 04-06…  VIPSUITE: Number: 8 out of 13  Rooms: 05-01 | 05-05 | 06-02…  List of rooms by room status:  Vacant:  Rooms: | 02-02 | 02-03…  Occupied:  Rooms: | 02-01 | 02-05…  Reserved:  Rooms:  UnderMaintenance:  Rooms: | 02-02 | 02-04… |
| Create room service menu | |
| Name: Chicken  Description: Chicken meat  Price: 10 | Item Created!  -Printing Menu Item-  Menu Name: Chicken  Description: Chicken meat  Menu Price: $10.00 |
| Update room service menu item | |
| Update: Chicken  Price: 5 | You have successfully updated the menu item!!!  -Printing Menu Item-  Menu Name: Chicken  Description: Chicken meat  Menu Price: $5.00 |
| Delete room service menu item | |
| Item: Chicken | Item Deleted! |
|  |  |
| Make a new reservation | |
| Number of rooms: 1  Room number: 05-01  New guest  Name: Peter Tan  Id: Passport  ID Number: 1234567890  Address: SG  Contact: 12345678  Gender: M  Country: SG  Nationality: SG  No credit card | Guest Created!  Guest Name: Peter Tan  ID No: 1234567890  Identity Type: PASSPORT  Gender: m  Contact No: 12345678  Country: SG  Nationality: SG  Address: SG  -Printing Credit Card-  Credit Card Name: null  Credit Card No : null  Credit Card Biling Address: null |
| Number of adults: 1  Number of children: 1  Check in Date: 21/04/2018  Check in Time: 09:00 AM  Pay by: Cash | Reservation created successfully!  Reservation Code: 1  Guest Name: Peter Tan  Room Number: |05-01|  Check In Date: 21/04/2018  Scheduled Check In Time: 09:00 AM  Status: CONFIRMED |
| Update guest information | |
| Name: Peter Tan  ID Number: 1234567890  Change: Name  New name: Alex Tan | You have successfully updated the guest information!!!!  -Printing Updated Information-  Guest Name: Alex Tan  ID No: 1234567890  Identity Type: PASSPORT  Gender: m  Contact No: 12345678  Country: SG  Nationality: SG  Address: SG  -Printing Credit Card-  Credit Card Name: null  Credit Card No : null  Credit Card Biling Address: null |
| Search for guest | |
| Name: Alex Tan  ID Number: 1234567890 | Guest Exist!  Guest Name: Alex Tan  ID No: 1234567890  Identity Type: PASSPORT  Gender: m  Contact No: 12345678  Country: SG  Nationality: SG  Address: SG  -Printing Credit Card-  Credit Card Name: null  Credit Card No : null  Credit Card Biling Address: null |
| Check in by reservation | |
| Guest ID: 1234567890 | Checked In Successfully! |
| Check in by walk in | |
| Number of rooms: 1  Room number: 05-05  Existing guest  Name: Alex Tan  ID Number: 1234567890 | Guest Exists! |
| Number of adults: 1  Number of children: 1  Pay by: Cash | Checked in successfully!  Reservation Code: 2  Guest Name: Alex Tan  Room Number: |05-05|  Check In Date: 18/04/2018  Scheduled Check In Time: 07:27 PM  Status: CHECKEDIN |
| Make a new reservation | |
| Number of rooms: 1  Room number: 06-02  Existing guest  Name: Alex Tan  ID Number: 1234567890 | Guest Exists! |
| Number of adults: 1  Number of children: 1  Check in Date: 21/04/2018  Check in Time: 09:00 AM  Pay by: Cash | Reservation created successfully!  Reservation Code: 3  Guest Name: Alex Tan  Room Number: |06-02|  Check In Date: 21/04/2018  Scheduled Check In Time: 09:00 AM  Status: CONFIRMED |
| Remove a reservation | |
| Guest ID: 1234567890 | Reservation Code: 3  Guest Name: Alex Tan  Room Number: |06-02|  Check In Date: 21/04/2018  Scheduled Check In Time: 09:00 AM  Status: CONFIRMED  Reservation Removed! |
| Order a room service | |
| Room number: 05-05  Item: Tonkatsu  Date: 21/04/2018  Time: 09:00 AM  Special request: spicy | Room Service Added! |
| Change Room service status | |
| Room number: 05-05  Item: Tonkatsu  Status: Delivered | Room Service Status updated to 'DELIVERED'! |
| Print all reservation | |
| Print all reservation | Reservation Code: 2  Guest Name: Alex Tan  Room Number: |05-05|  Check In Date: 18/04/2018  Scheduled Check In Time: 07:27 PM  Status: CHECKEDIN |
| Check out | |
| Name: Alex Tan  ID Number: 1234567890 | Reservation found!  Reservation Code: 2  Guest Name: Alex Tan  Room Number: |05-05|  Check In Date: 18/04/2018  Scheduled Check In Time: 07:27 PM  Status: CHECKEDIN |
| Check Out Date: 21/04/2018  Check Out Time: 09:00 AM  Discount: 0  Tax: 8 | Reservation Code: 2  Guest Name: Alex Tan  Room Number:  |05-05|  Pay by: Cash  Check in date: 18/04/2018  Check in time: 07:27 PM  Check out date: 21/04/2018  Check out time: 09:00 AM  No. of Adult: 1  No. of Children: 1  Walk in?: true  Type Item Price Date & TimeStamp  =============================================================  Room VIPSUITE ROOM 900.00 3 (weekdays)  Room (Weekend) VIPSUITE ROOM 330.00 1 (weekends)  Room Service Tonkatsu 8.00 21/04/2018 09:00 AM  Discount -0.0% -0.00 Nil  tax 8.0% 75.04 Nil  Total: $1013.04 |
| Confirm check out | Checked Out! |