PROJECT REPORT

OBJECT ORIENTED DESIGN AND PROGRAMMING

(2017/2018 SEM 2)

Members: Li Jin Quan(U1722463A)

Lee Jian Hao(U1721619C)

Kok Jia Hui(U1721022E)

Chen Xing Yu(U1721205J)

NANYANG TECHNOLOGICAL UNIVERSITY

CONTENTS

APPENDIX B _____ 3
UML CLASS DIAGRAM _____ 4
UML SEQUENCE DIAGRAM _____ 5
Object oriented design concepts _____ 6
Abstraction _____ 7
Encapsulation / Information Hiding _____ 7
Inheritance _____ 8
Polymorphism _____ 8
OO DESIGN CONSIDERATION _____ 9
SRP – Single Responsibility Principle. _____ 9
OCP – Open/Closed Principle. _____ 9
LSP – Liskov Substitution Principle. _____ 9
ISP – Interface Segregation Principle. _____ 9
DIP – Dependency Inversion Principle. _____ 9
TESTING _____ 10

APPENDIX B

APPENDIX B:

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

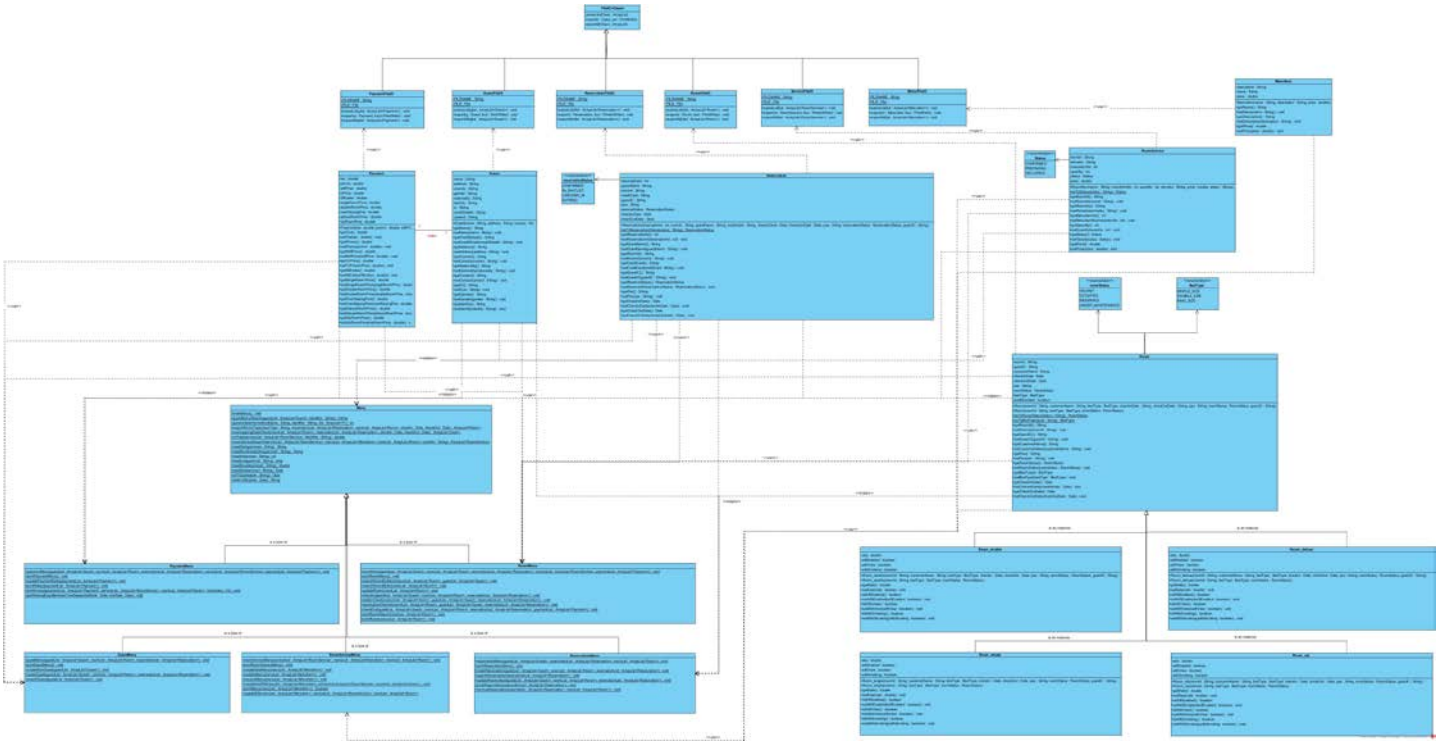
We understand that if plagiarism is found in the assignment, then lower marks or no marks will be awarded for the assessed work. In addition, disciplinary actions may be taken.

Name	Course (CE2002 or CZ2002)	Lab Group	Signature /Date
Li Jin Quan	CZ2002	FSP6	
Lee Jian Hao	CZ2002	FSP6	
Kok Jia [redacted]i Hui	CZ2002	FSP6	
Chen Xing Yu	CZ2002	FSP6	

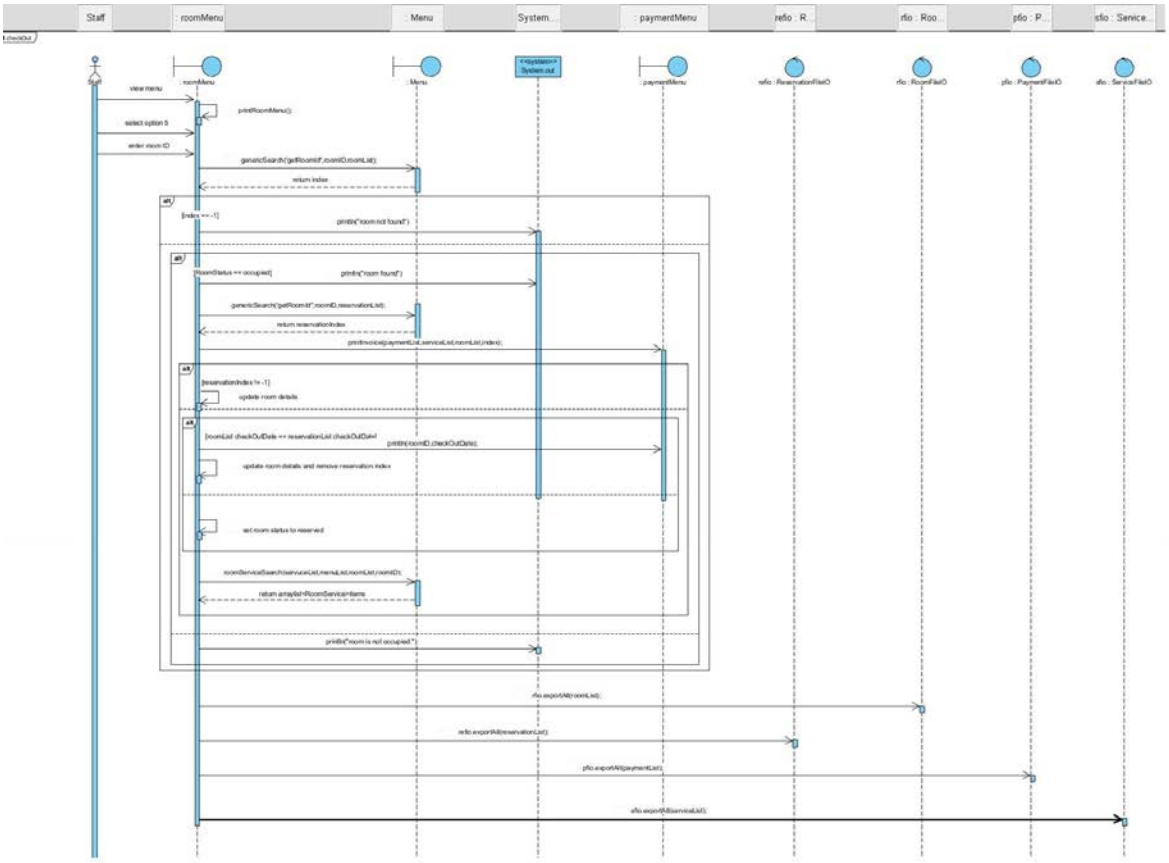
Important notes:

1. Name must **EXACTLY MATCH** the one printed on your Matriculation Card.

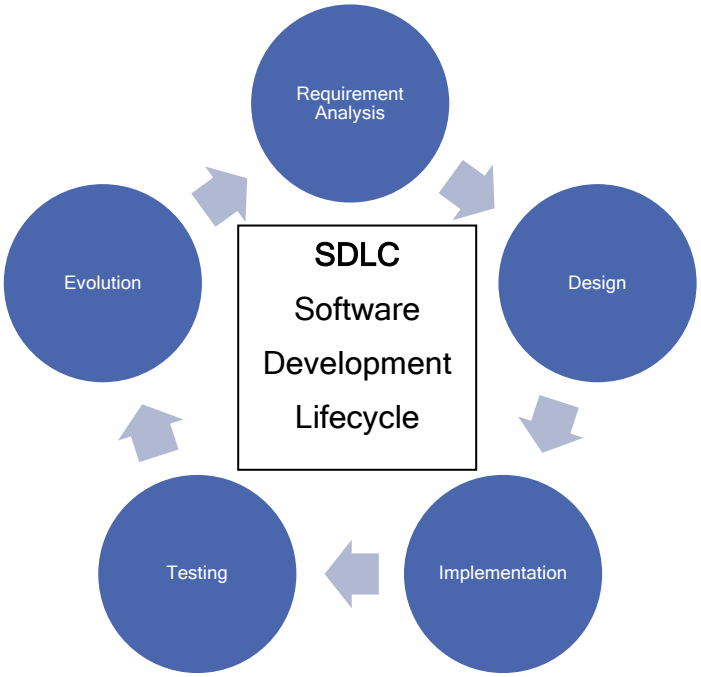
UML CLASS DIAGRAM



UML SEQUENCE DIAGRAM



OBJECT ORIENTED DESIGN CONCEPTS



Software Development Life Cycle is a well-defined, structured sequence of stages to develop the intended software product. Requirement and planning analysis allows the group members to evaluate various technical approaches that can be followed to implement the Hotel Reservation and Payment System successfully. A key component of a successful software is to have good design. It clearly defines all the architectural communication modules and data flow. It is a fundamental to Evolution stage where easy plug and play to the software allows extendibility, reusability and portability.

Assumption made:

- PaymentRate is a text file that must exist before program can run smoothly.
- Reservation and Maintenance must be planned and made at least 1 day in advance.
- Duration of stay must be at least 1 day.
- One Guest can make multiple reservations.
- Contact number of Guest is string as it can consist country code (e.g +65 for Singapore)
- User can only delete menu item from the menuList when there is no record of that menu item in serviceList.
- Each of the room have fixed attributes (e.g Wi-Fi, view, smoking), so customer who make a reservation should have already know the different specification of the room.
- Guest who check out early will still have to pay the full amount.
- Total price does not include view and smoking charges.
- Staff will physically check the Guest's ID when they are checking in with reservation.

Abstraction

In Object-Oriented(OO) technology, thinking in terms of objects perspective, it is the initial step to identify the essential characteristic of an object , include state, attributes and behaviors related to the object.

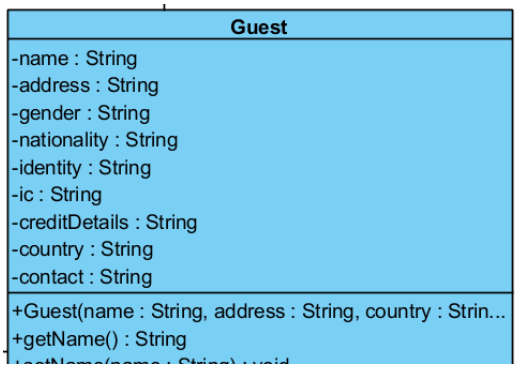


Figure 2:Guest entity class

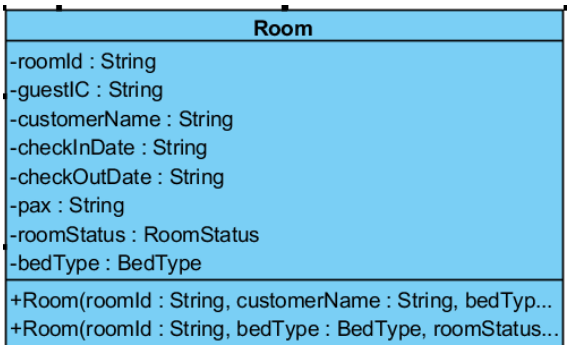


Figure 1: Room entity class

Encapsulation / Information Hiding

Encapsulation build a barrier to protect an objects private data. In good OO design, an object should only reveal the interface that other object needs to use. Information hiding is major part of encapsulation to avoid unnecessary modification to the data. For example,*Guest* class with private attributes such as name and address and modification are only available through getters and mutator methods. Robust classes are design with encapsulation in mind that is within control.

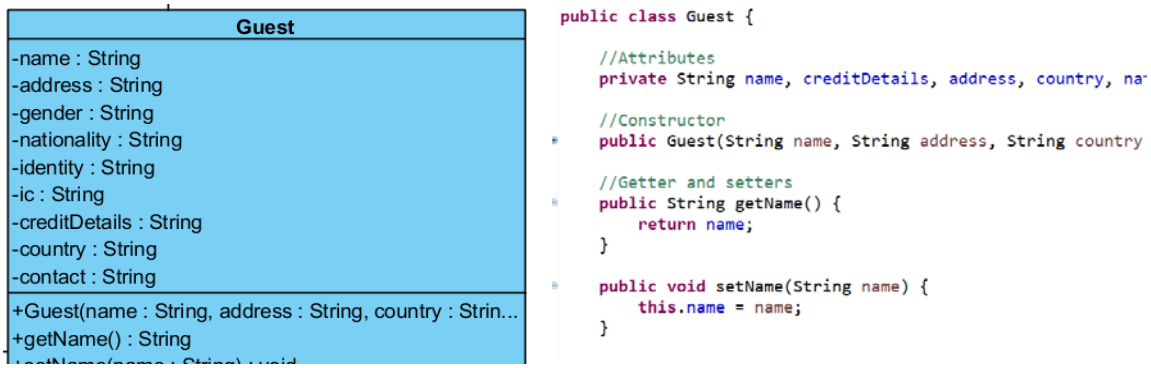
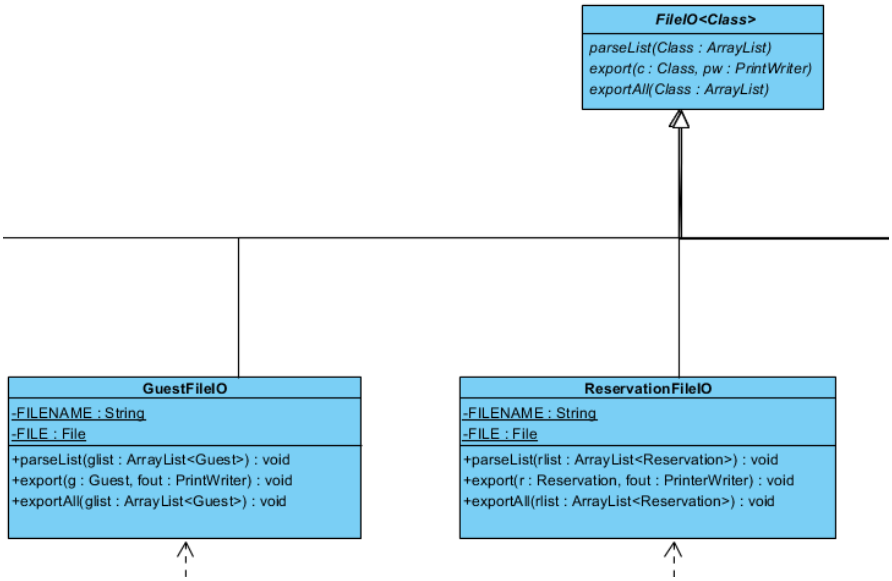


Figure 3: Guest entity class with code implementation



Inheritance

It is a power mechanism allow a class to inherit the attributes and methods of parent class. Some of the advantage is reduce in code duplication, extracting commonalities of various classes. For example abstract parent class of *FileIO,* inherit classes such as *GuestFileIO* and *ReservationFileIO* .

Polymorphism

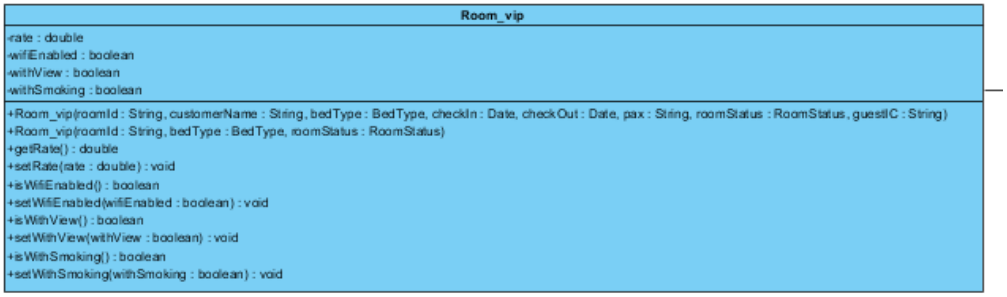
Polymorphism means many shapes. During runtime, actual object is being used, Polymorphism enable us to define any number of derived classes such as *GuestFileIO* and *ReservationFileIO* , different base class method such as parseList() and export() to allow polymorphism effect. No matter what kind of FileIO object is, correct method will return accordingly.

Future SMS Proposal

With this additional feature, guest who has made reservation will be sent a reminder message by SMS through our system. In order to implement this feature, we will importing Java library called “simplewire” into our current system. We will be creating a new class,”Sms.java” and there will be a static method that will make use of the existing function, genericSearch() , to retrieve the guest’s particulars. Also, we will set the subscriber setting that is provided by Simplewire’s resources as well as the message that is sent to the guest. Classes that required this function will only need to call this method. As a result, other classes will not be affected by this implementation.

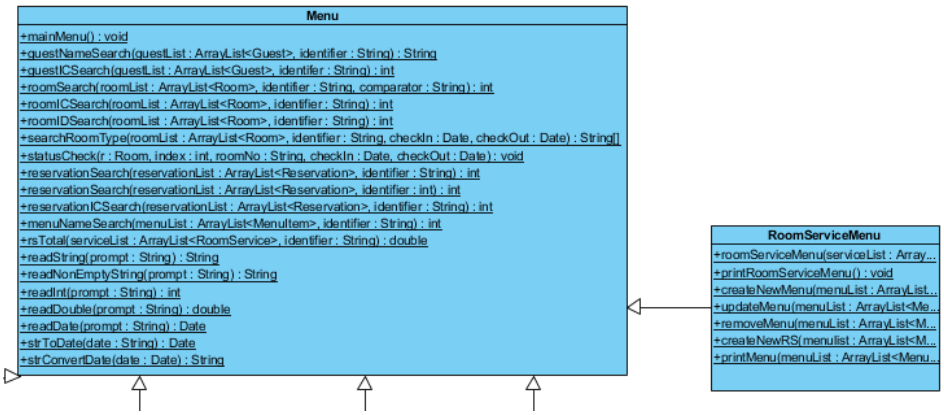
OO DESIGN CONSIDERATION

SRP – Single Responsibility Principle.



Room_vip will only be responsible for room that are used by VIP and the only reason that cause an alter will be due to the changes made to the attributes in this class. Therefore, there is only one responsibility and one reason for this class to change.

OCP – Open/Closed Principle.



As seen in the class diagram, RoomServiceMenu inherit methods from Menu. RoomServiceMenu which is the subclass will override methods in Menu which is the superclass however this will not cause any changes to the methods in the superclass. Therefore, we can change what the modules do, without touching the source code of modules.

LSP – Liskov Substitution Principle.

This is not applicable to the current system architecture.

ISP – Interface Segregation Principle.

This is not applicable to the current system architecture.

DIP – Dependency Inversion Principle.

This is not applicable to the current system architecture.

TESTING

```
Creating new guest
All fields are mandatory
Enter IC Number: S1111111A
Enter guest name: Chen Xing Yu
Enter guest address: 1 Temasek Ave #35-05 Millenia Tower, 039192, Singapore
Enter guest country: Singapore
Enter guest nationality: Singaporean
Enter guest gender[(M)ale/(F)emale]:M
Enter guest identity[(D)riving License/(P)assport]: D
Enter guest credit card detail: 4716998216108797
Enter guest contact number: 63255777
Guest Chen Xing Yu is successfully created !

Searching guest details
Please enter name of guest to search:
1:Chen Xing Yu, IC No.:S1111111A
2:Tao Gui Ying, IC No.:S2222222B
3:Jin Yao, IC No.:S3333333C
4:Qiu Qiao, IC No.:S4444444D
5:Xieren Lin, IC No.:S5555555E
6:Quit
Please select a guest to see more information.
```

Checking room details with guest name (but guest doesn't occupied any room)

```
Please enter the guest name you would like to search ('Enter' key to display all result): xing
1:chen xingyu, IC No.:s92746589e
2:Quit
Please select a guest to see more information.1
1:chen xingyu has been selected!
Guest is not assigned to any room
```

Checking room details with guest name

```
Please enter the guest name you would like to search ('Enter' key to display all result): kai
1:Wong Kai Zhen, IC No.:s1234578k
2:Quit
Please select a guest to see more information.1
1:Wong Kai Zhen has been selected!
 ------------------------------------------
Room No: 0201
Bed Type: SINGLE_SIZE
Room Status: OCCUPIED
Customer Name: Wong Kai Zhen
Check In: 05/05/2018
Check Out: 15/05/2018
Number of pax staying: 1
 ------------------------------------------
```

Checking room details with room ID

```
Please enter the room number you would like to search: 0202
Room with room ID: 0202 found!
 ------------------------------------------
Room No: 0202
Bed Type: DOUBLE_SIZE
Room Status: OCCUPIED
Customer Name: Wong Kai Zhen
Check In: Fri Apr 27 00:00:00 SRET 2018
Check Out: Sun May 06 00:00:00 SRET 2018
Number of pax staying: 1
 ------------------------------------------
```

Check In with Walk In method.

```
 Please enter the check in method: 1
Please enter the guest IC Number: s92746589e
Please enter the check out date [DD/MM/YYYY]: 20/04/2018
Please Enter the type of room you would like to enquiry [(S)ingle/d(O)uble/d(E)luxe/(V)ip]:V
Please select one of the room for booking
Room No. :0203
Room No. :0304
Room No. :0306
Room No. :0401
Room No. :0501
Room No. :0504
Room No. :0604
Room No. :0703
Room No. :0705
Please enter the room ID: 0203
Please enter the number of pax staying: 2
Guest chen xingyu have successfully checked in room 0203
```

Printing Room Report

```
Printing Room Status statistic report
Printing occupancy rate
 ----------------------------------------
Single:  Number: 2 out of 12
         Rooms: 02-01 02-02

Double:  Number: 2 out of 14
         Rooms: 02-04 02-06

Deluxe:  Number: 2 out of 13
         Rooms: 03-03 03-07

VIP:     Number: 1 out of 9
         Rooms: 03-04

Printing room status
 ------------------------------------------
Vacant:
         Rooms: 02-03 02-05 02-07 02-08 03-01 03-02 03-05 03-06 03-08 04-01 04-02 04-03 04-04 04-05 04-06 04-07 04-08 05-01 05-02 05-03 05-04 05-05 05-(

Occupied:
         Rooms: 02-01 02-02 02-04 02-06 03-03 03-04 03-07

Reserved:
         Rooms: None

Under maintenance:
         Rooms: None
```

Making Reservation

```
Please enter the guest IC Number: s92746589e
Guest with IC: s92746589e found!
Please enter the check in date [DD/MM/YYYY]: 21/04/2018
Please enter the check out date [DD/MM/YYYY]: 23/04/2018
Please enter the number of pax staying: 2
Please Enter the type of room:you would like to enquiry [(S)ingle/d(O)uble/d(E)luxe/(V)ip] :S
Please select one of the room for booking
Room No. :0201
Room No. :0202
Room No. :0205
Room No. :0208
Room No. :0302
Room No. :0305
Room No. :0308
Room No. :0506
Room No. :0601
Room No. :0606
Room No. :0702
Room No. :0706
Please enter the room ID: 0706
Room with room ID: 0706 reserved!
Reservation ID: 24626
Please present this ID during check in !
```

Printing Reservation List

```
 ------------------------------------------
Guest Name: Wong Kai Zhen
Room ID: 0201
Credit Card: 4676536787654678
Check In Date: Sat May 05 00:00:00 SRET 2018
Check Out Date: Tue May 15 00:00:00 SRET 2018
Pax:1
Reservation Status: CHECKED_IN
Guest IC: s1234578k
Reservation ID: 15390
 ------------------------------------------
Guest Name: chen xingyu
Room ID: 0706
Credit Card: 1111222233334444
Check In Date: Sat Apr 21 00:00:00 SRET 2018
Check Out Date: Mon Apr 23 00:00:00 SRET 2018
Pax:2
Reservation Status: CONFIRMED
Guest IC: s92746589e
Reservation ID: 24626
 ------------------------------------------
```

Updating Reservation Status

```
Please enter the reservation ID you would like to update: 24626
Reservation ID: 24626 found!
 ------------------------------------------
Please enter the new Status for the reservation! (C)onfirmed/(E)xpiredC
Reservation is not in waiting list.
Please enter the new Status for the reservation! (C)onfirmed/(E)xpiredE
 ------------------------------------------
 Reservation updated!
```

Check In with Reservation

```
==========================================
1. Walk In                                *
2. Reservation                            *
==========================================
Please enter the check in method: 2
Please enter the reservation number: 24626
Reservation number: 24626 found!
Successfully Check In to Room : 0706
```

Check Out

```
Please enter the room ID: 0304
Room with ID: 0304 found!
======================================
*               Invoice                *
======================================
No of days stayed:                     7
  5 Weekdays($250.0/days):        $1250
  2 Weekends($300.0/days):        $600
Delayed Check Out Fine:           $50.56
Room Service Total                $0
--------------------------------------
Sub-total:                        $1850
GST(7.0%)                         $128.21
Promotion(if any):                $18.5
======================================
Grand Total:                      $1959.7
```

```
Creating new menu item...
Enter menu name: Tiger Beer
Preparation method: Tiger Beer with Ice
Enter the item price: 6
------------------------------------------
Menu item created!
==========================================
```

Creating new Room Service order

```
 Please enter your choice: 4
Enter your room no: 0706
1 | Bee Hoon | deep fried | 5.0
2 | delicious chips | package | 4.0
3 | French Fries | deep fried | 3.0
4 | Tiger Beer | Tiger Beer with Ice | 6.0
Enter your option: 4
How many would you like to order ?: 5
Any remark(s) for your order ? ('Enter' key to skip)
```

Updating Menu Item

```
Updating menu details...
1 | Bee Hoon | deep fried | 5.0
2 | Delicious Chips | package | 4.0
3 | French Fries | deep fried | 3.0
4 | Tiger Beer | Tiger Beer with Ice | 6.0
Please enter the index of menu item to be updated: 2
Menu with name: Delicious Chips found!
 ----------------------------------------
Please enter new menu details ('Enter' key to skip)
Enter new menu name:
Enter new menu preparation method: Package
Enter new menu price: (Current price : 4.0) 4.0
 ----------------------------------------
 Menu item updated!
```

Updating RoomService Status

```
Please Enter the room ID: 0706
1:
Status : CONFIRMED
Item : Tiger Beer
Which item would you like to update: 1
Please enter the new Status (P)reparing/(D)elivered: D
```

Printing Payment rates

```
======================================
                Rates
======================================
Promotions:                          0 %
Tax:                                 7 %
Single Room:                      $100/day
Double Room:                      $130/day
Deluxe Room:                      $170/day
VIP Room:                         $250/day
----------Additional Charges:---------
Delayed Checkout Fine:            $50.56
Enabling Wifi:                    $50/day
Cabled Television                 $100/day
```