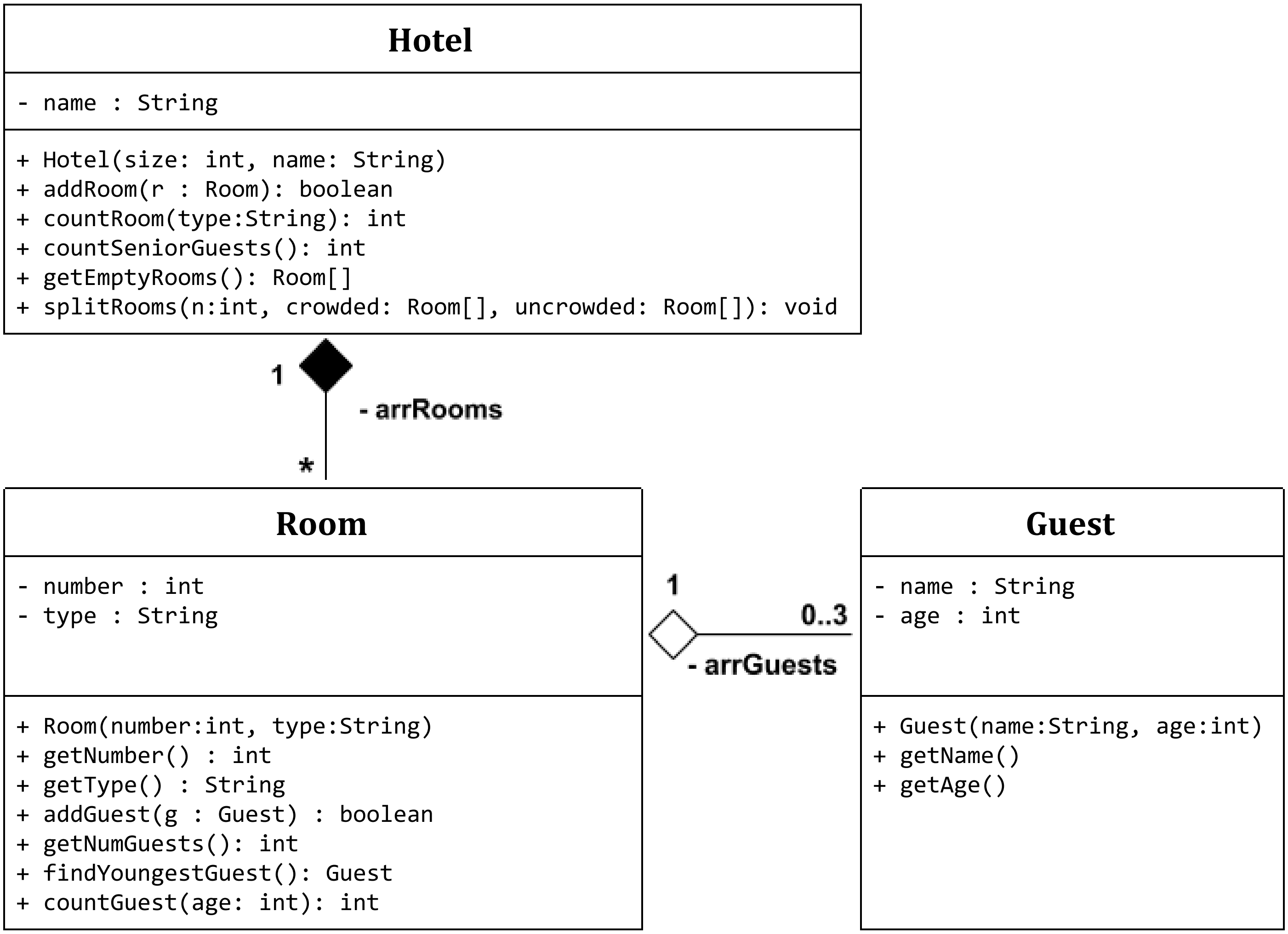
King Saud University
College of Computer & Information Science
CSC113 – Lab02
Relationship between Classes (Aggregation and Composition)

Submission rules:

- The project name must be: Lab02_ID_FirstName_LastName.zip. For example: Lab02_123456789_Marwan_Almaymoni.zip
- Use the default package.
- The due date is Wednesday 07/10/2020 11:59 PM via lms.ksu.edu.sa
- Email submissions will not be accepted.

Lab Exercise 1



```
Hotel
- name : String
+ Hotel(size: int, name: String)
+ addRoom(r : Room): boolean
+ countRoom(type:String): int
+ countSeniorGuests(): int
+ getEmptyRooms(): Room[]
+ splitRooms(n:int, crowded: Room[], uncrowded: Room[]): void
```

```
Room
- number : int
- type : String
+ Room(number:int, type:String)
+ getNumber() : int
+ getType() : String
+ addGuest(g : Guest) : boolean
+ getNumGuests(): int
+ findYoungestGuest(): Guest
+ countGuest(age: int): int
```

```
Guest
- name : String
- age : int
+ Guest(name:String, age:int)
+ getName()
+ getAge()
```

Guest class:

- Attributes:
  - ***name*****:** the name of the guest.
  - ***age*****:** the age of the guest.
- Methods:
  - ***Guest(name : String, age : int):*** constructor
  - ***getName():*** this method returns the name of the guest.
  - ***getAge():*** this method returns the age of the guest.

Room class:

- Attributes:
  - ***number:*** the room's number.
  - ***type*****:** the room's type. Either "VIP" or "Normal."
- Methods:
  - ***Room(number : int, type : String):*** constructor.
  - ***getNumber():*** this method returns the number of the room.
  - ***getType():*** this method returns the type of the room.
  - ***addGuest(g: Guest):*** this method adds a guest ***g*** to the room. It returns *true* if the guest ***g*** is successfully added. Otherwise, it returns *false*.
  - ***getNumGuests():*** this method returns the number of guests in the room.
  - ***findYoungestGuests():*** this method returns the youngest guests in the room.
  - ***countGuests(age: int):*** this method returns the number of guests in the room having the age greater or equal to ***age***.

Hotel class:

- Attributes:
  - ***name:*** the name of the hotel.
- Methods:
  - ***Hotel(size : int, name : String):*** constructor
  - ***addRoom(r: Room):*** this method adds a room ***r*** to the Hotel. It returns *true* if the room ***r*** is successfully added. Otherwise, it returns *false*.
  - ***countRoom(type:String):*** this method returns the number of rooms with the type ***type***.
  - ***countSeniorGuests():*** this method returns the number of guests having the age greater or equal to ***50***.
  - ***getEmptyRooms():*** this method returns an array of rooms without any guests in them.

    - ***splitRooms(n:int, crowded: Room[], uncrowded: Room[]):*** this method receives two arrays. It inserts the rooms with guests greater than ***n*** into the array ***crowded***. It inserts the rooms with guests equal or less than ***n*** into the array ***uncrowded***.

Question: Translate into Java code the classes ***Hotel***, ***Room***, and ***Guest***. Then, write a main class ***Main*** that creates an object of class Hotel. The object should have your name as its name. The size should be 10. Then it should show the following menu:

```
Enter 1: Add a new Room.
Enter 2: Book room to guests.
Enter 3: Statistics
Enter 0: Exit
```

Enter 1: Add a new Room.

- Ask the user to choose the room type.

```
Choose room type:
Enter 1: VIP
Enter 2: Normal
```

- The room number should be the number of rooms plus one.
- Show if the room was added successfully or not.

Enter 2: Book room to guests.

- Show a list of empty rooms. If there was no empty rooms, print "There are no empty rooms"

```
Choose a room:
Enter 1: Room 1, VIP
Enter 2: Room 3, Normal
Enter 3: Room 4, Normal
```

- Ask the user to add guests by typing their names and ages. Then type done when finished.

```
Name: Ali                    Name: Ali
Age: 55                      Age: 55
Name: Fahad                  Name: Fahad
Age: 14                      Age: 14
Name: done                   Name: Lulu
                             Age: 12
```

Enter 3: Statistics

- Show number of “VIP” rooms and number of “Normal” rooms.
- Show number of empty rooms.
- Show number of crowded rooms (3 guests) and uncrowded rooms (1 oe 2 guests).
- Show the total number of guests.
- Show number of senior guests.
- Show the age of the youngest guest.