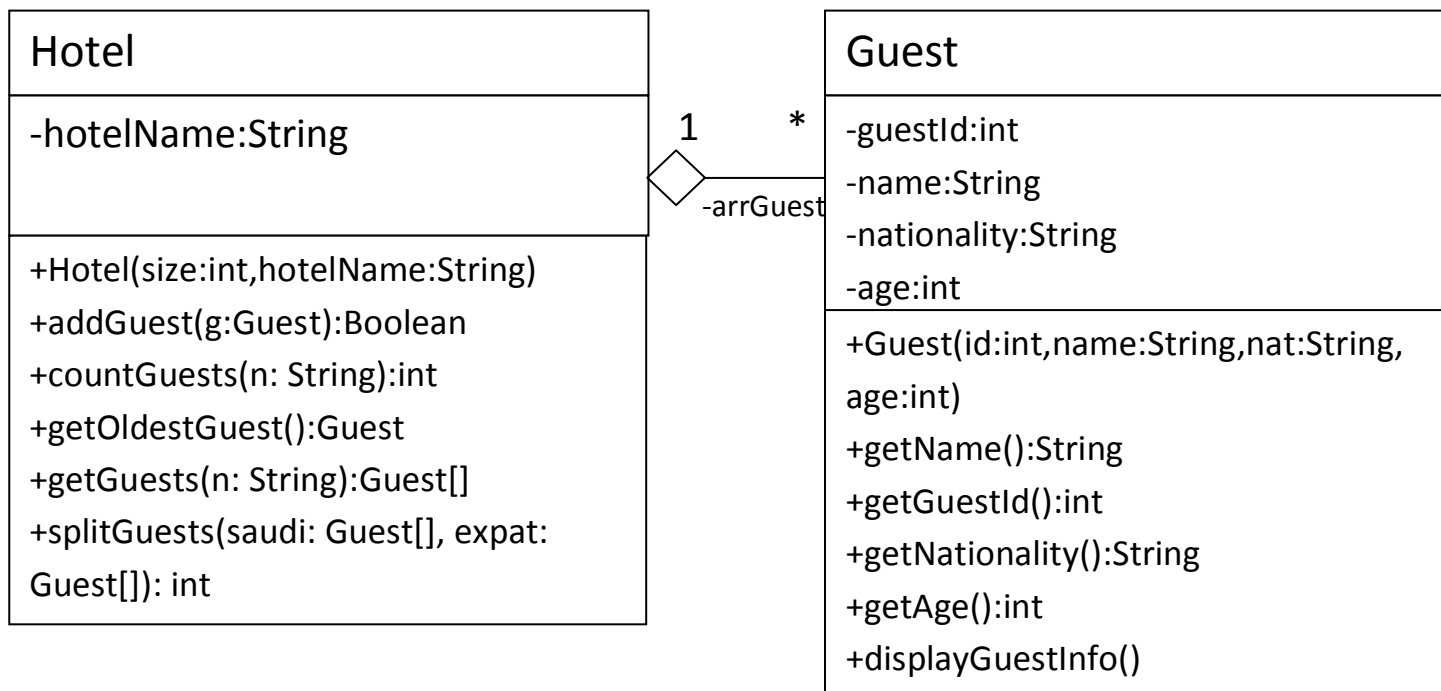




Lab: **Relationship between Classes (Aggregation)**

Create the classes along with the functionality given in the following UML Diagram. To understand the problem, please refer to the description given after the diagram.



**Guest Class:**

○ Attributes:

- `guestId`: unique id of the guest.
- ***name***: the name of the guest.
- ***nationality***: The nationality of the guest.

○ Methods:

- ***Guest(id:int,name: string, nationality: String, age: int)***: constructor
- ***displayGuestInfo()***: this method displays all the attributes of the guest.
- ***Getters***



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**Hotel Class:**

○ Attributes:

- **hotelName**: name of the hotel.

○ Methods:

- **Hotel(size:int, name:String)**: constructor
- **addGuest(g:Guest)**: this method adds a guest to the hotel. It returns true if the **Guest g** is added; false otherwise.
- **countGuest(n:String)**: this method returns the number of guests of the hotel who are of nationality **n**.
- **getOldestGuest()**: this method returns the oldest guest of the hotel.
- **getGuests(n:String)**: this method returns an array containing all guests of the hotel who are of nationality **n**.
- **split(saudi: Guest[], expat: Guest[])**: This method inserts all Saudi guests of the hotel into the array **saudi**. The other guests (non-Saudi guests) are inserted into the array **expat**. This method returns the number of non-Saudi guests inserted into the array **expat**.

Write a java program that will deal with hotel processing of different daily guests. Hotel can contain many guests. The java program will consist of two classes given in the above UML diagram and a test class that will display following Menu to execute different member functions of these classes.

To add a new guest, Enter 1

To get the number of guests of a given nationality, Enter 2

To get and display the oldest guest, Enter 3

To get and display all guests of a given nationality, enter 4

To view all Saudi guests in the Hotel, Enter 5

To Exit, Enter 0

Enter Your Option: \_\_\_\_\_



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**Lab: Relationship between Classes (Aggregation)**

```
public class Guest {
    private int guestId;
    private String name;
    private String nationality;
    private int age;
    public Guest(int guestId, String name, String nationality,
int age) {

        this.guestId = guestId;
        this.name = name;
        this.nationality = nationality;
        this.age = age;
    }
    public int getGuestId() {
        return guestId;
    }
    public String getName() {
        return name;
    }
    public String getNationality() {
        return nationality;
    }
    public int getAge() {
        return age;
    }

    public void displayGuestInfo()
    {
        System.out.println("Guest Id: "+guestId);
        System.out.println("Guest Name: "+name);
        System.out.println("Guest Nationality: "+nationality);
        System.out.println("Guest Age: "+age);
    }

}
```



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**Lab: Relationship between Classes (Aggregation)**

```
public class Hotel {
    private String hotelName;
    private Guest arrGuests[];
    private int nbGuests;
    public Hotel(String hotelName, int size) {

        this.hotelName = hotelName;
        arrGuests=new Guest[size];
        nbGuests=0;
    }

    public boolean addGuest(Guest g)    {
        if(nbGuests<arrGuests.length)
        {
            arrGuests[nbGuests++]=g;
            return true;
        }
        else
            return false;
    }

    int countGuests(String n)
    {
        int count=0;
        for(int i=0; i<nbGuests; i++)
            if(arrGuests[i].getNationality().equals(n))
                count++;

        return count;
    }

    Guest getOldestGuest()
    {
        Guest oldest=arrGuests[0];

        for(int i=1; i<nbGuests; i++)
            if(arrGuests[i].getAge()>oldest.getAge())
                oldest=arrGuests[i];

        return oldest;
    }
}
```



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Lab: **Relationship between Classes (Aggregation)**

```
}

public Guest[] getGuests(String n)
{
    Guest guests[]=new Guest[nbGuests];
    int j=0;
    for(int i=0;i<nbGuests;i++)

        if(arrGuests[i].getNationality().equals(n))
        {
            guests[j]=arrGuests[i];
            j++;
        }

    return guests;
}

public int splitGuests(Guest[] saudi, Guest[] expat)    {
    int j=0,k=0;
    for(int i=0;i<nbGuests;i++)
        if(arrGuests[i].getNationality().equals("Saudi"))
        {
            saudi[j]=arrGuests[i];
            j++;
        }
        else
        {
            expat[k]=arrGuests[i];
            k++;
        }

    return k;
}

}
```



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**Lab: Relationship between Classes (Aggregation)**

```
import java.util.Scanner;
public class Main {

    /**
     * @param args
     */
    public static void main(String[] args) {
        // TODO Auto-generated method stub
        //This program assumes single word String input.

        Scanner input=new Scanner(System.in);
        Hotel h=new Hotel("Marriot",10);
        int choice;
        String nat;
        int nGuests;

        do
        {

            System.out.println("To Add a new Guest Enter 1 ");
            System.out.println("To get the number of Guests of
given nationality Enter 2 ");
            System.out.println("To get and display oldest Guest
Enter 3 ");
            System.out.println("To get and display all Guests of a
given nationality Enter 4 ");
            System.out.println("To view all Saudi Guests Enter 5
");
            System.out.println("To Exit Enter 0 ");
            System.out.println("Enter Option___");
            choice=input.nextInt();

            switch(choice)
            {
                case 1:
                    System.out.println("Enter Id,Name,Nationality and
Age of Guest ");
                    Guest g=new
Guest(input.nextInt(),input.next(),input.next(),input.nextInt());
                    ;

                    if( h.addGuest(g))
```



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Lab: **Relationship between Classes (Aggregation)**

```
        System.out.println("Guest Added  
Successfully");  
        else  
            System.out.println("Hotel Full");  
        break;  
    case 2:  
        System.out.println("Enter Nationality");  
        nat=input.next();  
        System.out.println("No Of "+nat+" Guests are  
"+h.countGuests(nat));  
        break;  
    case 3:  
        Guest oldest=h.getOldestGuest();  
        if(oldest!=null)  
        {  
            System.out.println("Oldest Guest in the  
Hotel is ");  
            oldest.displayGuestInfo();  
        }  
        else  
            System.out.println("Hotel is vacant");  
        break;  
    case 4:  
        System.out.println("Enter Nationality");  
        nat=input.next();  
        nGuests=h.countGuests(nat);  
        if(nGuests==0)  
            System.out.println("No Guest of this  
Nationality Found");  
        else  
        {  
            Guest guests[]=h.getGuests(nat);  
            for(int k=0;k<nGuests;k++)  
                guests[k].displayGuestInfo();  
        }  
        break;  
    case 5:  
        nGuests=h.countGuests("Saudi");  
        if(nGuests==0)
```



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**Lab: Relationship between Classes (Aggregation)**

```
        System.out.println("No Guest of Saudi  
Nationality Found");  
        else  
        {  
        Guest guests[]=h.getGuests("Saudi");  
        for(int k=0;k<nGuests;k++)  
            guests[k].displayGuestInfo();  
        }  
        break;  
  
    }  
  
    }  
  
    while(choice !=0);  
  
    }  
  
}
```