IQRA NATIONAL UNIVERSITY

FINAL ASSIGNMENT BS SOFTWARE ENGINEERING

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SEMESTER 2nd BS(SE)

SUBJECT: Object Oriented Programming

Question 1 : How to check Even and Odd numbers in java using object oriented approach?

Main.java EvenOddFinder.java

```java
public class EvenOddFinder {
// creating a class file



   // defining static class method to call without object instance
   public static String EO(int Number) {

      if(Number % 2 == 0) {// checking if number is divided by 2 and the out put is 0
         // modulus in other words

         return String.format("%d is an ODD Number", Number); //returning result in string
      }else {

         return String.format("%d is an Even Number", Number);
      }


   }


}
```

Main.java EvenOddFinder.java

```java

import java.util.Scanner;
//explicit  import of scanner class from util package

public class Main {
   //scanner object to take input
   static Scanner sc =  new Scanner(System.in);

   //just a method to make life easier :D
   static void Print(String s) {System.out.println(s);}


   public static void main(String[] args) {

      Print("please write a whole number to check if its Even or Odd:");
      int num =  sc.nextInt(); //taking input
      Print(EvenOddFinder.EO(num));//printing output using static method call

   }


}
```

Outline Console

<terminated> Main (1) [Java Application] C:\Program Files\Java\jre1.8.0_221\bin\javaw.exe (11-Jul-2020, 8:00:41 pm)

```
please write a whole number to check if its Even or Odd:
5
5 is an Even Number
```

Question 2 : How to add 2 complex numbers in java using object oriented approach?

Main.java ComplexNumber.java

```java
public class ComplexNumber {

    public int real; // holder for real number of a complex number
    public int img;// holder for img number of a complex number

    ComplexNumber(int realpart, int Imgpart){//constructor

        real =  realpart;
        img = Imgpart;
    }


    public String format() {// just a method which returns String in proper complex shape

        return String.format("(%d + %di)", real,img);
    }
    //public class method addition which takes two complexNumber objects
    public static String Addition(ComplexNumber first,ComplexNumber second) {

        int realAdd = first.real + second.real;//calculating realpart
        int imgAdd = first.img + second.img;//calculating img part
        System.out.println("-->"+first.format() + " + "+ second.format());

        return String.format("= (%d + %di) ", realAdd,imgAdd); //returns String object
    }
}
```

Main.java | ComplexNumber.java

```java
import java.util.Scanner;
//explicit  import of scanner class from util package
public class Main {
    //scanner object to take input
    static Scanner sc =  new Scanner(System.in);

    //just a method to make life easier :D
    static void Print(String s) {System.out.print(s);}

    public static void main(String[] args) {

    Print("please enter 2 sets for 2 complex numbers like (5 + 2i) each value in order:\n");
    int[] numbers = new int[4];//declaring 4 spaces for numbers 2*2 =4
    for(int i = 0; i <  numbers.length;i++) {
        if(i%2 == 0) { //if index is real number we say real this is because index starts 0
            Print("real Number:");
            numbers[i] = sc.nextInt();
            }else {
                Print("img Number:");
                numbers[i] = sc.nextInt();
            }}
    ComplexNumber a = new ComplexNumber(numbers[0],numbers[1]);
    ComplexNumber b = new ComplexNumber(numbers[2],numbers[3]);

    Print("\n"+ComplexNumber.Addition(a, b));
    }
}
```

Outline | Console

<terminated> Main (1) [Java Application] C:\Program Files\Java\jre1.8.0_221\bin\javaw.exe (11-Jul-2020, 8:28:08 pm)

```
please enter 2 sets for 2 complex numbers like (5 + 2i) each value in order:
real Number:2
img Number:4
real Number:5
img Number:6
-->(2 + 4i) + (5 + 6i)

= (7 + 10i)
```

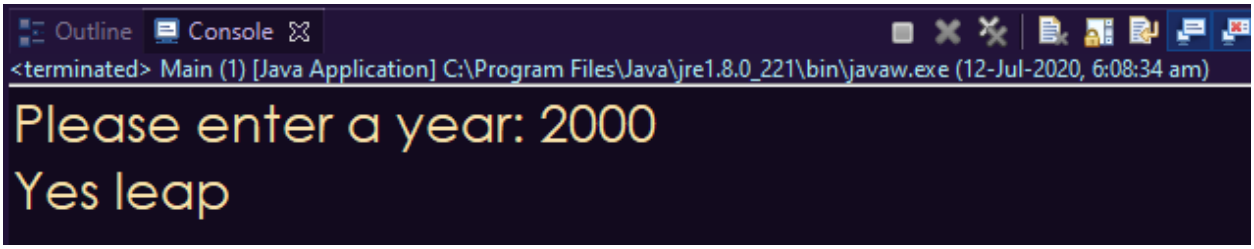
Question 3: How to check Leap year in java using object oriented approach?

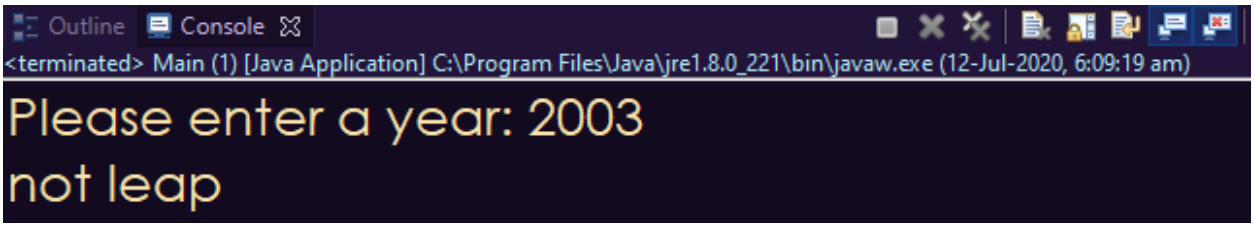
Main.java LeapFinder.java

```java
public class LeapFinder {



   public static String Leap(int year) {

      // using ternary operator checking for leap condition
       String Isleap = (year%4 == 0 && (year %100 != 0 || year %400 == 0))? "Yes leap" : "not leap";


      return Isleap; // returning string

   }


}
```

Main.java LeapFinder.java

```java
import java.util.Scanner;
//explicit  import of scanner class from util package
public class Main {
    //scanner object to take input
    static Scanner sc =  new Scanner(System.in);

    //just a method to make life easier :D
    static void Print(String s) {System.out.print(s);}

    public static void main(String[] args) {

    Print("Please enter a year: ");
    int year  = sc.nextInt();
    Print(LeapFinder.Leap(year));

    }
}
```





Question 4: How to check that the input from the user is the vowel or not in java using object oriented approach?

Main.java VovelFinder.java

```
1  public class VovelFinder {
2
3      String[] vovel = {"a","e","i","o","u","y"}; //an array holding vovels
4      String  word ;// actual word from user input
5      VovelFinder(String w){
6          //~contructor
7          word = w;
8      }
9
10     public boolean isvovel() {
11         for(String a : vovel) { // checking array each item
12             if(word.compareToIgnoreCase(a) == 0) {// comparing it with word
13                 return true;// if it is then return true
14             }
15         }
16
17         return false;// else returing false
18
19     }
20
21 }
```

Main.java VovelFinder.java

```java
import java.util.Scanner;
//explicit  import of scanner class from util package
public class Main {
    //scanner object to take input
    static Scanner sc =  new Scanner(System.in);

    //just a method to make life easier :D
    static void Print(String s) {System.out.print(s);}

    public static void main(String[] args) {


        Print("write a word to check if its vovel or not: ");

        String word = sc.next();

        VovelFinder vovel = new VovelFinder(word);

        Print(String.format("%s is an vovel : %b", word , vovel.isvovel()));

    }
}
```

Outline Console

<terminated> Main (1) [Java Application] C:\Program Files\Java\jre1.8.0_221\bin\javaw.exe (12-Jul-2020, 7:25:09 am)

```
write a word to check if its vovel or not:
a
a is an vovel : true
```

Outline Console

<terminated> Main (1) [Java Application] C:\Program Files\Java\jre1.8.0_221\bin\javaw.exe (12-Jul-2020, 7:27:32 am)

```
write a word to check if its vovel or not: d
d is an vovel : false
```

Question 5: How to use power of a number in java using object oriented approach?

Main.java MathPower.java

```
1
2  class CustomNumber {
3
4      private float Number; // number holder
5
6      CustomNumber(int num){//constructor for int input
7          Number  = num;
8      }
9
10     CustomNumber(float num){//constructor for float input
11         Number  = num;
12     }
13     //class
14     public static float Power(CustomNumber num,int exponent) {
15         float Answer = 1;
16         for (;exponent != 0; exponent--) //using for loop back order
17           {
18               Answer *= num.Number; // multiplying answer to number 1*2*2*2*2 etc
19           }
20
21         return Answer; // returning float
22
23     }
24
25 }
```

Main.java | MathPower.java

```java
import java.util.Scanner;
//explicit  import of scanner class from util package
public class Main {
    //scanner object to take input
    static Scanner sc =  new Scanner(System.in);

    //just a method to make life easier :D
    static void Print(String s) {System.out.print(s);}

    public static void main(String[] args) {

        Print("Please enter the number you want power of :");
        float number = sc.nextFloat();
        Print("Please enter the power :" );
        int Pow = sc.nextInt();

        CustomNumber num = new CustomNumber(number);
        Print(String.format("= %.1f",CustomNumber.Power(num, Pow)));

    }
}
```

Outline | Console

<terminated> Main (1) [Java Application] C:\Program Files\Java\jre1.8.0_221\bin\javaw.exe (12-Jul-2020, 7:51:16 am)

```
Please enter the number you want power of :2
Please enter the power :2
= 4.0
```