Department of Computer Science

Final Term Exam Spring 2020

Subject: Object Oriented Programming (Lab)

BS (CS,SE)   Instructor: M.Ayub Khan

There are total **5** questions in this paper.

Note:

At the top of the answer sheet there must be the ID, Name and semester of the concerned Student.

Students must have to provide the output of their respective programs. Students have same answers or programs will be considered fail. Programs in Java or codes should be explained clearly.

As this paper is online so incase of any ambiguity my Whatsapp no. is 034499121116.

Each question carry equal marks.
Please answer briefly.

Q1. How to check Even and Odd numbers in java using object oriented approach?

Q2. How to add 2 complex numbers in java using object oriented approach?

Q3. How to check Leap year in java using object oriented approach?

Q4. How to check that the input from the user is the vowel or not in java using object oriented approach?

Q5. How to use power of a number in java using object oriented approach?

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Program: bs(cs)2

Q1. How to check Even and Odd numbers in java using object oriented approach?

Ans: Java program to find whether given number is even or odd
An even number is a number which is divisible by 2. Therefore, perform
%2 operation on the given number, if the result is 0 then the given
number is even else given number is odd.
EG:

```java
import java.util.Scanner;
public class EvenOrOdd {
public static void main(String args[]){
//Reading number from user
Scanner sc = new Scanner(System.in);
System.out.println("Enter a number ::" );
int num = sc.nextInt();

//Finding even or odd

if (num % 2 == 0){
System.out.println("Entered number is an even number");
} else {
System.out.println("Entered number is an odd number");
}
}
}
```

OUTPUT
Enter a number ::
9
Entered number is an odd number

Q2. How to add 2 complex numbers in java using object oriented approach?

Ans: Example – Adding two complex numbers in Java
In this program we have a class ComplexNumber. In this class we have two instance variables real and img to hold the real and imaginary parts of complex numbers.
We have declared a method sum() to add the two numbers by adding their real and imaginary parts together.

The constructor of this class is used for initializing the complex numbers. For e.g. when we create an instance of this class like this ComplexNumber temp = new ComplexNumber(0, 0);, it actually creates a complex number 0 + 0i.

```java
public class ComplexNumber{
//for real and imaginary parts of complex numbers
double real, img;

//constructor to initialize the complex number
ComplexNumber(double r, double i){
this.real = r;
this.img = i;
}

public static ComplexNumber sum(ComplexNumber c1,
ComplexNumber c2)
{
//creating a temporary complex number to hold the sum of two
numbers
ComplexNumber temp = new ComplexNumber(0, 0);

temp.real = c1.real + c2.real;
temp.img = c1.img + c2.img;

//returning the output complex number
return temp;
}
```

```
public static void main(String args[]) {
ComplexNumber c1 = new ComplexNumber(5.5, 4);
ComplexNumber c2 = new ComplexNumber(1.2, 3.5);
ComplexNumber temp = sum(c1, c2);
System.out.printf("Sum is: "+ temp.real+" + "+ temp.img
+"i");
}
}
```

OUTPUT
Sum is: 6.7 + 7.5i

Q3. How to check Leap year in java using object oriented approach?

Ans: Using Ternary Operator

1) The ternary operator syntax is "if (condition)? value1:value2;", if the condition is true then it returns value1, otherwise it returns value2.

2) We are calculating the given year is a leap year or not. A year divisible by 400 (or) a year divisible by 4 and not divisible by 100 is a leap year.

3) Read the year value using scanner object sc.nextLong and store it in the variable y.

In given example y=1948, y!=0, it is divisible by 400 so c=1 return to a, a is initialized as a=1. Then it prints 1948 is a leap year.
```
class Leapyear
{
public static void main(String arg[])
{
```

```java
long a,y,c;
Scanner sc=new Scanner(System.in);
System.out.print("enter any calendar year :");
y=sc.nextLong();
if(y!=0)

{

a=(y%400==0)?(c=1):((y%100==0)?(c=0):((y%4==0)?(c=1):(c=0)));
if(a==1)
System.out.println(y+" is a leap year");

else

System.out.println(y+" is not a leap year");
}
else
System.out.println("year zero does not exist ");

}
}
```

OUTPUT
Enter any calendar year : 1950
1950 is not a leap year

Q4. How to check that the input from the user is the vowel or not in java using object oriented approach?

Ans: Java Program To Print Whether The Given Alphabet is Vowel Or Consonant

Here we are using switch case, generally switch is used one out of multiple options, an if-else ladder can also be used to select one out of multiple options. In simple words, we can say the switch is a multi-branch statement.

Here the combination of both small letters and capital letters are represented as vowels. With the help of the case statement, the output will display on what the user is going to be entered. If it is out of 10 alphabets, it will display vowel or else consonant.
switch case print vowel or consonant javaJava

```
1
2
3
4
5
6
7
8
9
10
11
12

13
14
15
16
17
18
19
20
21
22
23
24
25
26
```

```
27
28
29
30
31
32

import java.util.Scanner;
class Char
{
public static void main(String[ ] arg)
{
int i=0;
Scanner sc=new Scanner(System.in);
System.out.println("Enter a character : ");
char ch=sc.next( ).charAt(0);
//char ch=sc.nextChar();
switch(ch)
{
case 'a' :
case 'e' :
case 'i' :
case 'o' :
case 'u' :
case 'A' :
case 'E' :
case 'I' :

case 'O' :
case 'U' :i++;
}
if(i==1)
System.out.println("Entered character "+ch+" is Vowel");
else
if((ch>='a'&&ch<='z')||(ch>='A'&&ch<='Z'))
System.out.println("Entered character "+ch+" is
```

```
Consonent");
else
System.out.println("Not an alphabet");
}
}
```

OUTPUT
Enter a Character:
A
Entered character A is vowel

Q5. How to use power of a number in java using object oriented approach?

Ans: Program to calculate power of a number using while loop
```
public class JavaExample {
public static void main(String[] args) {
int number = 5, p = 2;
long result = 1;

int i=p;
while (i != 0)
{
result *= number;
--i;
}
System.out.println(number+"^"+p+" = "+result);
}
}
```

OUTPUT

5^2=25