

Object Oriented Programming Lab

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Object Oriented Programming

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Experiment 2

Title : Basic Java Programming

ques! Write a program to find the largest of 3 numbers?

```
public class addtwonum {
```

```
    public static void main (String args[]) {
```

```
        int sum, num1, num2; //variable to store arguments
```

```
        num1 = Integer.parseInt (args[0]);
```

```
        num2 = Integer.parseInt (args[1]);
```

```
        sum = num1 + num2;
```

```
        System.out.println(sum);
```

```
    }
```

```
}
```

ques 2 Write a program to add two numbers using commandline arguments.

```
public class findlargest
```

```
{
```

```
    public static void main (String args[])
```

```
    {
```

```
        int largest, num1, num2, num3;
```

```
        num1 = Integer.parseInt (args[0]);
```

```
        num2 = Integer.parseInt (args[1]);
```

```
        num3 = Integer.parseInt (args[2]);
```

```
        if (num1 > num2 && num1 > num3)
```

```
        { largest = num1; }
```

```
        if (num2 > num1 && num2 > num3)
```

```
        { largest = num2; }
```

```
        if (num3 > num1 && num3 > num2)
```

```
        { largest = num3; }
```

```
        System.out.println (largest);
```

```
    }
```

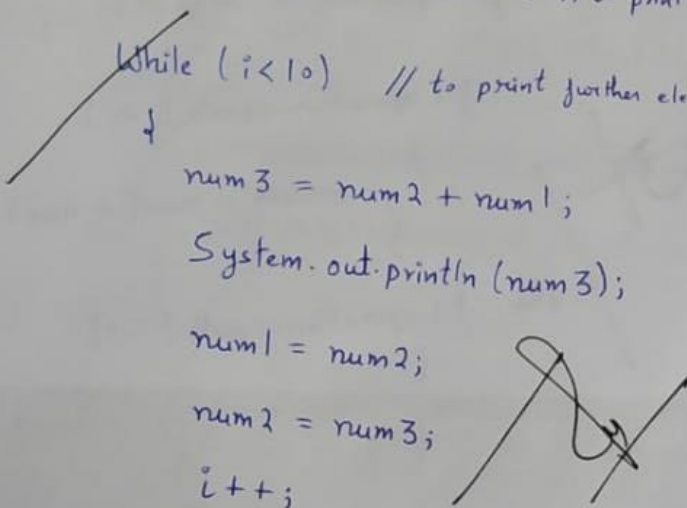
```
}
```

ques 3 Write a program to print Fibonacci series using loop.

```
public class fibonacci
{
    public static void main (String args[])
    {
        int i=0, num1, num2, num3;

        System.out.println (num1); //to print first number of series
        System.out.println (num2); //to print second number of series
        While (i<10) // to print further elements of series
        {
            num3 = num2 + num1;
            System.out.println (num3);

            num1 = num2;
            num2 = num3;
            i++;
        }
    }
}
```



ques 4 Write a program to implement command line calculator

```
public class calc
```

```
{
```

```
    public static void main(String args[])
```

```
    {
```

```
        int num1 = Integer.parseInt(args[0]),
```

```
        num2 = Integer.parseInt(args[2]), answer;
```

```
    };
```

```
    String operation = args[1];
```

```
    if (operation.equals("+"))
```

```
    {
```

```
        answer = num1 + num2;
```

```
    }
```

```
    else if (operation.equals("-"))
```

```
    {
```

```
        answer = num1 - num2;
```

```
    }
```

```
    else if (operation.equals("*"))
```

```
    {
```

```
        answer = num1 * num2;
```

// provide the input as java calc 2 '*' 3 because the asterisk symbol
// is considered as wild card character by the shell

```
    else if (operation.equals("/"))
```

```
    {
```

```
        answer = num1 / num2;
```

```
    }
```

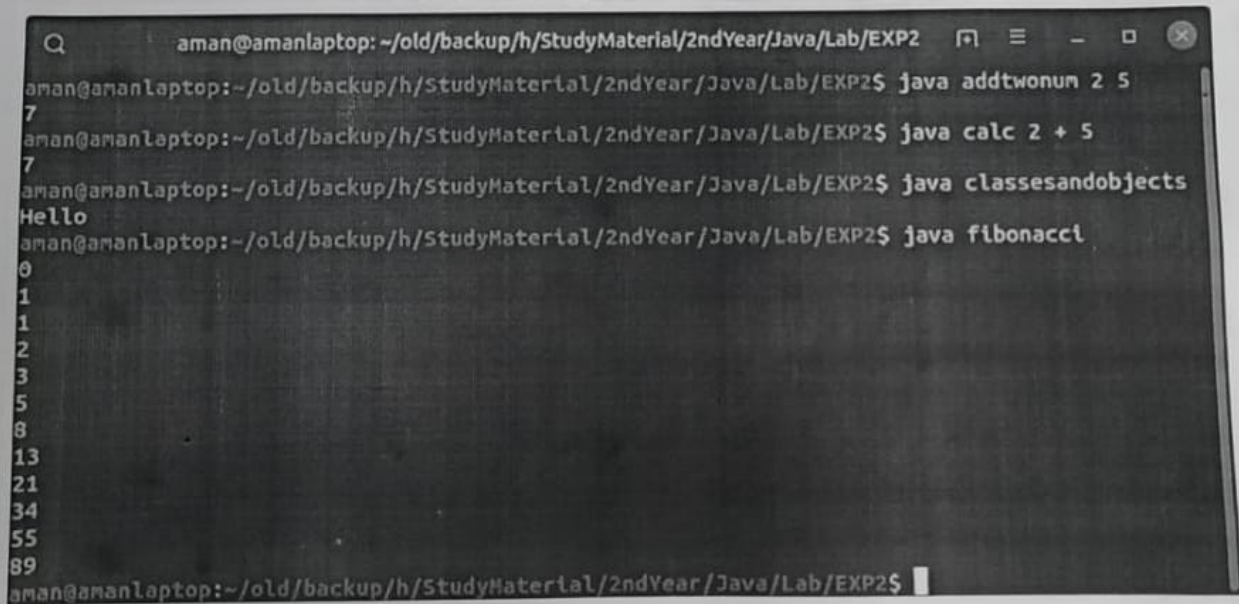
```
    System.out.println(answer);
```

```
}
```

```
}
```

ques 5 Write a program using classes and objects.

```
public class classesandobjects
{
    static class Hello
    {
        public void printhello()
        {
            System.out.println ("Hello");
        }
    }
    public static void main (String args[])
    {
        classesandobjects.Hello obj = new classesandobjects.Hello();
        obj.printhello();
    }
}
```

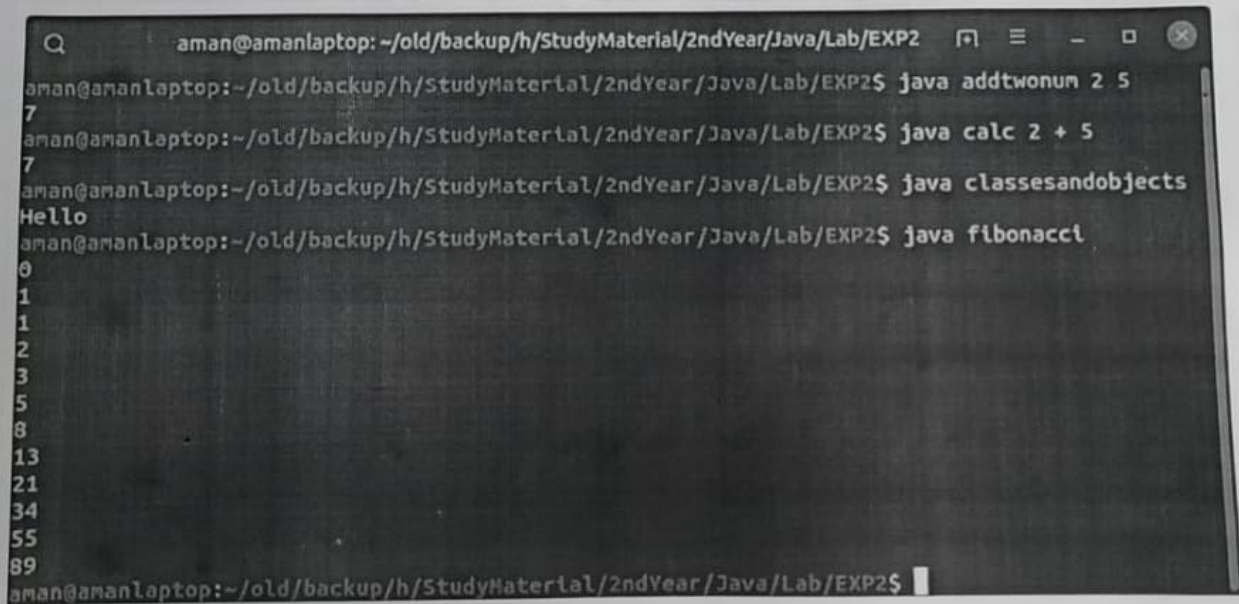


The screenshot shows a terminal window with the following commands and output:

```
aman@amanlaptop: ~/old/backup/h/StudyMaterial/2ndYear/Java/Lab/EXP2
aman@amanlaptop:~/old/backup/h/StudyMaterial/2ndYear/Java/Lab/EXP2$ java addtwonum 2 5
7
aman@amanlaptop:~/old/backup/h/StudyMaterial/2ndYear/Java/Lab/EXP2$ java calc 2 + 5
7
aman@amanlaptop:~/old/backup/h/StudyMaterial/2ndYear/Java/Lab/EXP2$ java classesandobjects
Hello
aman@amanlaptop:~/old/backup/h/StudyMaterial/2ndYear/Java/Lab/EXP2$ java fibonacci
0
1
1
2
3
5
8
13
21
34
55
89
aman@amanlaptop:~/old/backup/h/StudyMaterial/2ndYear/Java/Lab/EXP2$
```


ques 5 Write a program using classes and objects.

```
public class classesandobjects
{
    static class Hello
    {
        public void printhello()
        {
            System.out.println ("Hello");
        }
    }
    public static void main (String args[])
    {
        classesandobjects.Hello obj = new classesandobjects.Hello();
        obj.printhello();
    }
}
```



The screenshot shows a terminal window with the following commands and output:

```
aman@amanlaptop: ~/old/backup/h/StudyMaterial/2ndYear/Java/Lab/EXP2
aman@amanlaptop:~/old/backup/h/StudyMaterial/2ndYear/Java/Lab/EXP2$ java addtwonum 2 5
7
aman@amanlaptop:~/old/backup/h/StudyMaterial/2ndYear/Java/Lab/EXP2$ java calc 2 + 5
7
aman@amanlaptop:~/old/backup/h/StudyMaterial/2ndYear/Java/Lab/EXP2$ java classesandobjects
Hello
aman@amanlaptop:~/old/backup/h/StudyMaterial/2ndYear/Java/Lab/EXP2$ java fibonacci
0
1
1
2
3
5
8
13
21
34
55
89
aman@amanlaptop:~/old/backup/h/StudyMaterial/2ndYear/Java/Lab/EXP2$
```



Experiment 3

ques! Write a program to accept 10 students marks in an array, arrange it into ascending order, convert into the following grades and print marks and grades in the tabular form.

Between 40 and 50 : PASS

Between 51 and 75 : MERIT

Between 76 and 100 : DISTINCTION



```
public class Marksandgrades
{
    public int studentno, marks;

    public static void main (String args[])
    {
        Marksandgrades obj[] = new Marksandgrades[10];
        Marksandgrades temp = new Marksandgrades ();
        for (int i = 0; i < 10; i++)
        {
            Marksandgrades objtemp = new Marksandgrades ();
            obj[i] = objtemp;
            obj[i].studentno = i + 1;
            obj[i].marks = Integer.parseInt (args[i]);
        }
    }
}
```

```
for (int j=0; j<10; j++) // to sort the marks
```

```
{  
    for (int i=0; i<10; i++)
```

```
{  
    if (obj[j].marks > obj[i].marks)
```

```
{  
        temp = obj[j];
```

```
        obj[j] = obj[i];
```

```
        obj[i] = temp;
```

```
    }
```

```
}
```

```
}
```

```
for (int j=0; j<10; j++) // to print all the marks with grades
```

```
{
```

```
    if (obj[j].marks <= 50 && obj[j].marks >= 40)
```

```
    { System.out.println(obj[j].marks + " PASS"); }
```

```
    else if (obj[j].marks <= 75 && obj[j].marks >= 51)
```

```
    { System.out.println(obj[j].marks + " MERIT"); }
```

```
    else if (obj[j].marks >= 76)
```

```
    {
```

```
        System.out.println(obj[j].marks + " DISTINCTION");
```

```
    }
```

```
}
```

```
}
```

```
}
```

ques 2 Write a program to accept three digits (i.e 0-9) and print all the possible combinations.

```
public class possiblecomb
```

```
{
```

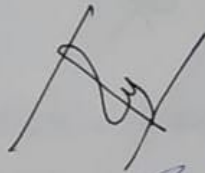
```
    public static void main (String args[])
```

```
    {
```

```
        int num1 = Integer.parseInt (args [0]),
```

```
        num2 = Integer.parseInt (args [1]),
```

```
        num3 = Integer.parseInt (args [2]);
```



```
        System.out.println (" " + num3 + num2 + num1 +
```

```
                               " " + num2 + num1 + num3 +
```

```
                               " " + num3 + num1 + num2 +
```

```
                               " " + num1 + num2 + num3 +
```

```
                               " " + num2 + num3 + num1 +
```

```
                               " " + num1 + num3 + num2);
```

```
    }
```

```
}
```

ques 3 Write a program to accept 10 numbers in an array and compute the square of each number. Print the sum of these numbers.

```
public class Squaresum
```

```
{
```

```
    public static void main (String args[])
```

```
    {
```

```
        int num[];
```

```
        num = new int[10];
```

```
        int sum;
```

```
        for (int i = 0 ; i < 10 ; i++) // to add the square of 10 numbers
```

```
        {
```

```
            num[i] = Integer.parseInt (args[i]);
```

```
            sum += num[i] * num[i]; // adding the square to sum
```

```
        }
```

```
        System.out.println (sum);
```

```
    }
```

```
}
```

que ques 4

Write a program to input a number of a month (1-12) and print its equivalent name of the months.

```
public class monthname
```

```
{
```

```
    public static void main (String args[])
```

```
    {
```

```
        int month = Integer.parseInt (args[0]);
```

```
        if (month == 1) { System.out.println ("Jan"); }
```

```
        else if (month == 2) { System.out.println ("Feb"); }
```

```
        else if (month == 3) { System.out.println ("Mar"); }
```

```
        else if (month == 4) { System.out.println ("Apr"); }
```

```
        else if (month == 5) { System.out.println ("May"); }
```

```
        else if (month == 6) { System.out.println ("Jun"); }
```

```
        else if (month == 7) { System.out.println ("Jul"); }
```

```
        else if (month == 8) { System.out.println ("Aug"); }
```

```
        else if (month == 9) { System.out.println ("Sep"); }
```

```
        else if (month == 10) { System.out.println ("Oct"); }
```

```
        else if (month == 11) { System.out.println ("Nov"); }
```

```
        else if (month == 12) { System.out.println ("Dec"); }
```

```
    }
```

```
}
```

que ques 4

Write a program to input a number of a month (1-12) and print its equivalent name of the months.

```
public class monthname
```

```
{
```

```
    public static void main (String args[])
```

```
    {
```

```
        int month = Integer.parseInt (args[0]);
```

```
        if (month == 1) { System.out.println ("Jan"); }
```

```
        else if (month == 2) { System.out.println ("Feb"); }
```

```
        else if (month == 3) { System.out.println ("Mar"); }
```

```
        else if (month == 4) { System.out.println ("Apr"); }
```

```
        else if (month == 5) { System.out.println ("May"); }
```

```
        else if (month == 6) { System.out.println ("Jun"); }
```

```
        else if (month == 7) { System.out.println ("Jul"); }
```

```
        else if (month == 8) { System.out.println ("Aug"); }
```

```
        else if (month == 9) { System.out.println ("Sep"); }
```

```
        else if (month == 10) { System.out.println ("Oct"); }
```

```
        else if (month == 11) { System.out.println ("Nov"); }
```

```
        else if (month == 12) { System.out.println ("Dec"); }
```

```
    }
```

```
}
```


Ques 5 What a program to find the sum of all integers greater than 40 and less than 250 that are divisible 5

```
public class divbyfifty
```

```
{
```

```
    public static void main (String args[])
```

```
    {
```

```
        int sum = 0;
```

```
        for (int i = 41; i < 251; i++) // to go through all the num b/w  
                                         // 40 & 251
```

```
        {
```

```
            if (i % 5 == 0)
```

```
            {  
                sum += i; // adding the satisfying numbers
```

```
            }
```

```
        }
```

```
        System.out.println (sum);
```

```
    }
```

```
}
```

```
aman@amanlaptop: ~/old/backup/h/StudyMaterial/2ndYear/Java/Lab/EXP3
aman@amanlaptop:~/old/backup/h/StudyMaterial/2ndYear/Java/Lab/EXP2$ java findlargest 2 5 7
7
aman@amanlaptop:~/old/backup/h/StudyMaterial/2ndYear/Java/Lab/EXP2$ cd ..
aman@amanlaptop:~/old/backup/h/StudyMaterial/2ndYear/Java/Lab$ cd EXP3
aman@amanlaptop:~/old/backup/h/StudyMaterial/2ndYear/Java/Lab/EXP3$ java divbyfifty
6195
aman@amanlaptop:~/old/backup/h/StudyMaterial/2ndYear/Java/Lab/EXP3$ java Marksandgrades 20
33 88 44 66 99 25 44 66 15
20 DISTINCTION
33 DISTINCTION
44 PASS
44 PASS
15 DISTINCTION
44 PASS
66 MERIT
66 MERIT
aman@amanlaptop:~/old/backup/h/StudyMaterial/2ndYear/Java/Lab/EXP3$ java monthname 2
Feb
aman@amanlaptop:~/old/backup/h/StudyMaterial/2ndYear/Java/Lab/EXP3$ java possiblecomb 2 5 7
752 527 725 257 572 275
aman@amanlaptop:~/old/backup/h/StudyMaterial/2ndYear/Java/Lab/EXP3$ java Squaresum 5 6 7 8
9 10 11 12 13 14
985
aman@amanlaptop:~/old/backup/h/StudyMaterial/2ndYear/Java/Lab/EXP3$
```


Experiment 4

TITLE : Inheritance

ques 1 Write a Java program to show that private members of a super class cannot be accessed from derived classes.

```
class superclass
{
    public void print-accessable ()
    {
        System.out.println ("accessible");
    }
    private void print-unaccessible ()
    {
        System.out.println ("unaccessible");
    }
}

class subclass extends superclass
{
    public void print-subclass ()
    {
        System.out.println ("subclass");
    }
}
```

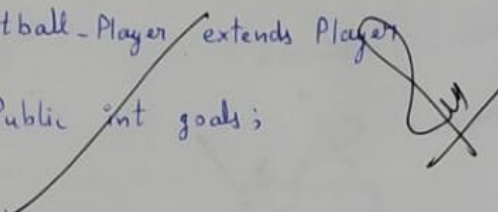
// driver class

```
public class superclassmember
{
    public static void main (String args[])
    {
        subclass g = new subclass ();
        g.print-accessable ();
        // g.print-unaccessible (); g.print-subclass ();
    }
}
```

ques 2 Write a program in Java to create a Player class. Inherit the classes Cricket-Player, Football-Player, Hockey-Player from Player class.

```
class Cricket-Player extends Player
{
    public int runs;
}
```

```
class Football-Player extends Player
{
    public int goals;
}
```



```
class Hockey-Player extends Player
{
    public int score;
}
```

```
class Chess-Player extends Player
{
    public int elo;
}
```

// Driver class

```
public class Player
{
    public String Name;
    int pl-id;
    public void getname()
    {
        System.out.println("Chess Player: " + Name);
    }
}
```

```

    static
    public void main (String args[])
    {
        Player g1 = new Player();
        g1.Name = "Aman";

        Chess-Player g2 = new Chess-Player();
        g2.Name = "Animesh";
        g2.getname();
    }
}

```

Ques 3

Write a class Worker and derive classes DailyWorker and SalariedWorker from it.

Every worker has a name and a salary rate. Write a method ComPay (int hours) to compute the week pay of every worker.

Daily worker is paid on the number of days he work. SalariedWorker gets wage for 40 hours a week.

Test this program to calculate the pay of workers.

You are expected to use the concept of polymorphism to write the program.

```
class DailyWorker extends Worker
```

```
{
```

```
    public void ComPay (int hours)
```

```
    {
```

```
        int wage = hours * salaryrate;
```

```
        System.out.println("Wage: " + wage);
```

```
    }
```

```
}
```

```
class SalariedWorker extends Worker
```

```
{
```

```
    public void ComPay ()
```

```
    {
```

```
        int wage = 40 * salaryrate;
```

```
        System.out.println("Wage: " + wage);
```

```
    }
```

```
}
```

```
// driver class
```

```
public class Worker
```

```
{
```

```
    public String Name;
```

```
    public int salaryrate = 55;
```

```
    public static void main (String args[])
```

```
    {
```

```
        SalariedWorker g1 = new SalariedWorker();
```

```

g1.name = "Aman";
DailyWorker g2 = new DailyWorker();
g2.Name = "Animesh";
g1.ComPay();
g2.ComPay(41);
}
}

```

quer 4 Consider the trunk calls of a telephone exchange. A trunk call can be ordinary, urgent or lightning. The charges depend on the duration and type of the call. Write a program using concept of polymorphism in Java to calculate the charges.

```

class urgent extends call
{
    public void ComPay (int time)
    {
        int rate = 55;
        int price = time * rate;
        System.out.println ("Price: " + price);
    }
}
}

```

```
class lightning extends call
```

```
{  
    public void ComPay (int time)  
    {  
        int rate = 50;  
        int price = time * rate;  
        System.out.println ("Price: " + price);  
    }  
}
```

```
class ordinary extends call
```

```
{  
    public void ComPay (int time)  
    {  
        int rate = 35;  
        int price = time * rate;  
        System.out.println ("Price: " + price);  
    }  
}
```

```
// driven class
```

```
public class call
```

```
{  
    public int time = 10;  
    public static void main (String[] args)  
    {  
        ordinary g1 = new ordinary();  
        urgent g2 = new urgent();  
        lightning g3 = new lightning();  
    }  
}
```

```
g1. ComPay (15);
```

```
g2. ComPay (time);
```

```
g3. ComPay (time);
```

```
}
```

```
}
```

ques 5 Design a class employee of an organization. An employee has a name, empid and salary. Write the default constructor, a constructor with parameters (name, empid and salary) and methods to return name and salary.

Also write a method increase salary that raises the employee's salary by certain user specified percentage. Derive a subclass Manager from employee. Add an instance variable named department to manager. Supply a test program that uses these classes and methods

```
class Manager extends employee
```

```
{
```

```
    public int depart-id;
```

```
    public String department;
```

```
}
```

```
// Driver class
```

```
public class employee
```

```
{
```

```
    public String name;
```

```
    public int empid, salary;
```



```
employee ()
```

```
{
```

```
    System.out.println ("object values needs to be set");
```

```
}
```

```
employee (int eid, String name, int sal)
```

```
{
```

```
    this.name = name; // this keyword is used to reference current object
```

```
    empid = eid;
```

```
    salary = sal;
```

```
}
```



```
public String getname ()
```

```
{
```

```
    return name;
```

```
}
```

```
public int getsalary ()
```

```
{
```

```
    return salary;
```

```
}
```

```
public void Increasesalary (int per)
```

```
{
```

```
    salary += (salary * per) / 100;
```

```
}
```

```
public static void main (String args[])
```

```
{
```

```
    employee g1 = new employee (67759, "Aman", 500000);
```

```
    System.out.println ("Employee Salary: " + g1.getsalary());
```

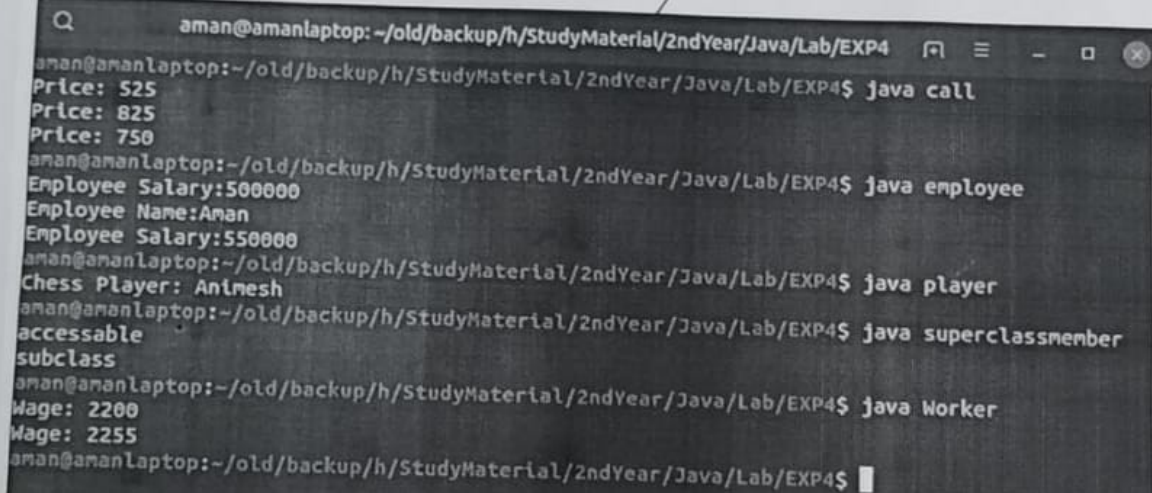
```
    System.out.println ("Employee Name: " + g1.getname());
```

```
    g1.increasesalary (10);
```

```
    System.out.println ("Employee Salary: " + g1.getsalary());
```

```
}
```

```
}
```



The screenshot shows a terminal window with the following output:

```
aman@amanlaptop: ~/old/backup/h/StudyMaterial/2ndYear/Java/Lab/EXP4
Price: 525
Price: 825
Price: 750
aman@amanlaptop:~/old/backup/h/StudyMaterial/2ndYear/Java/Lab/EXP4$ java call
Employee Salary:500000
Employee Name:Aman
Employee Salary:550000
aman@amanlaptop:~/old/backup/h/StudyMaterial/2ndYear/Java/Lab/EXP4$ java player
Chess Player: Animesh
aman@amanlaptop:~/old/backup/h/StudyMaterial/2ndYear/Java/Lab/EXP4$ java superclassmember
accessible
subclass
aman@amanlaptop:~/old/backup/h/StudyMaterial/2ndYear/Java/Lab/EXP4$ java Worker
Wage: 2200
Wage: 2255
aman@amanlaptop:~/old/backup/h/StudyMaterial/2ndYear/Java/Lab/EXP4$
```

Experiment 5

q1

TITLE: Interface

ques! Write a program to create interface named test. In this interface the number one member function is square. Implement this to arithmetic class. Create one new class called ToTestInt. In this class create object of arithmetic.

```
interface test
{
    int square (int a);
}
class arithmetic implements test
{
    int num;
    public int square (int a) { return a*a; }
    int add (int a) { return a+a; }
}
public class ToTestInt
{
    public static void main (String args[])
    {
        arithmetic a1 = new arithmetic();
        System.out.println (a1.square(2));
    }
}
```

ques 2

Write a program to create interface A, in this interface we have two methods meth1 and meth2. Implement this interface to class MyClass.

```
interface A
{
    void meth1();
    void meth2();
}
```

```
public class MyClass implements A
{
    public void meth1() { System.out.println("Method1"); }
    public void meth2() { System.out.println("Method2"); }
```

```
    public static void main (String args[])
    {
        MyClass obj = new MyClass();
        obj.meth1();
        obj.meth2();
    }
}
```

ques 3 Write a program to show the usefulness of interfaces as a place to keep constant value of the program.

```
interface ar.  
{  
    double pi = 3.14;  
    double getarea (double r);  
}  
class circle implements ar  
{  
    public double getarea (double r)  
    {  
        double area = 2 * pi * r;  
        return area;  
    }  
}  
  
public class AreaCalc  
{  
    public static void main (String args[])  
    {  
        circle c1 = new circle ();  
        System.out.println (c1.getarea (1));  
    }  
}
```

ques 4 Write a program to create an Interface having two methods division and modulus. Create a class that overrides the methods.

```
interface cal
```

```
{  
    int division (int num);  
    int modulus (int num);  
}
```

```
public class Calc implements cal
```

```
{  
    public int division (int num)
```

```
{  
        return num/2;  
    }
```

```
}
```

```
    public int modulus (int num)
```

```
{  
        return num%2;  
    }
```

```
}
```

```
public static void main (String args[])
```

```
{
```

```
    Calc cl = new Calc();
```

```
    System.out.println (cl.division (2));
```

```
    System.out.println (cl.modulus (2));
```

```
}
```

```
}
```



```
Q aman@amanlaptop: ~/old/backup/h/StudyMaterial/2ndYear/Java/Lab/EXP5  [+][≡]- □ X
aman@amanlaptop: ~/old/backup/h/StudyMaterial/2ndYear/Java/Lab/EXP5$ java AreaCalc
6.28
aman@amanlaptop: ~/old/backup/h/StudyMaterial/2ndYear/Java/Lab/EXP5$ java Calc
1
0
aman@amanlaptop: ~/old/backup/h/StudyMaterial/2ndYear/Java/Lab/EXP5$ java TestInt
4
aman@amanlaptop: ~/old/backup/h/StudyMaterial/2ndYear/Java/Lab/EXP5$ java MyClass
Method1
Method2
aman@amanlaptop: ~/old/backup/h/StudyMaterial/2ndYear/Java/Lab/EXP5$ █
```


Experiment 6

Q1: Write a Java program to implement the concept of importing classes from user defined package and created packages.

```
package exp6;
```

```
import java.util.Scanner;
```

```
public class pac {  
    public int num1, num2;  
    protected String member;
```

```
    public pac() // defining constructor  
    {
```

```
        System.out.println("Enter value of num1,num2");
```

```
        Scanner in = new Scanner(System.in); /* making object for scanner class*/
```

```
        num1 = in.nextInt();
```

```
        num2 = in.nextInt();
```

```
        System.out.println(num1 + num2);
```

```
    }
```

```
}
```

```
package exp601;
```

```
import exp6.pac;
```

```
public class main
```

```
{
```

```
    public static void main(String[] args)
```

```
    {
```

```
        pac obj = new pac();
```

```
        System.out.println("value of num1 is: " + obj.num1);
```

```
        System.out.println("value of num2 is: " + obj.num2);
```

```
    }
```

```
}
```

Output:

```
Enter value of num1,num2  
1  
2  
3  
value of num1 is: 1  
value of num2 is: 2
```

Q2: Write a program to make a package Balance. This has an Account class with Display_Balance method. Import Balance package in another program to access Display_Balance method of Account class.

```
package exp6;
import java.util.Scanner;
class account {
    public String name;
    public int balance;

    account() {
        Scanner in = new Scanner(System.in);
        System.out.println("Enter you name :");
        name = in.nextLine();
        System.out.println("Enter your balance");
        balance = in.nextInt();
        System.out.println();
        System.out.println("dear :" + name + " your balance is :" + balance);
    }
}

public class pac {
    account obj = new account();
}

package exm6;
import exp6.pac;
public class main {
    public static void main(String[] args) {
        pac obj = new pac();
    }
}
```

```
Enter you name :
Aman Kumar Gupta
Enter your balance
500000
|
dear :Aman Kumar Gupta your balance is :500000
```

Experiment 7

Q1: Write a program in Java to display the names and roll numbers of students. Initialize respective array variables for 10 students. Handle `ArrayIndexOutOfBoundsException`, so that any such problem doesn't cause illegal termination of program.

```
import java.lang.ArrayIndexOutOfBoundsException;
import java.util.Arrays;
import java.util.Scanner;
class exp7 {
String[] name = new String[5];
int[] rollno = new int[5];
}
public class Exception1 {
public static void main(String[] args) throws ArrayIndexOutOfBoundsException {
exp7 obj = new exp7();
for (int i = 0; i < obj.rollno.length; i++) {
try { // identification of error in try block
Scanner in = new Scanner(System.in);
System.out.println("Enter the name of the student");
obj.name[i] = in.nextLine();
System.out.println("Enter the roll no of the student");
obj.rollno[i] = in.nextInt();
}
catch (ArrayIndexOutOfBoundsException e) // catching the errors
{
System.out.println("index is exceeding");
}

}

System.out.println(Arrays.toString(obj.name));

System.out.println(Arrays.toString(obj.rollno));

}

}
```

```
aman@localhost:~/Downloads/LetsCodeJava-master/Lab Experiments/Experiment 7
File Edit View Search Terminal Help
(base) [aman@localhost Experiment 7]$ java Exception1
Enter the name of the student
Aman
Enter the roll no of the student
500067759
Enter the name of the student
X
Enter the roll no of the student
1
Enter the name of the student
Y2
Enter the roll no of the student
2
Enter the name of the student
Z
Enter the roll no of the student
3
Enter the name of the student
^C(base) [aman@localhost Experiment 7]$
```

Q2: Write a Java program to enable the user to handle any chance of divide by zero exception.

```
import java.util.Scanner;
class demoexception {
int num1, num2;
void dividefunction() {
System.out.println("Enter two numbers: ");
Scanner in = new Scanner(System.in);
num1 = in.nextInt();
num2 = in.nextInt();
try { // here it will throw exception
int result = num1 / num2;
System.out.println(result);
} catch (ArithmeticException e)
{
// here we get answers to our exception
System.out.println("A number can not be divided by 0");
}
}
}
public class Exception2 {
public static void main(String[] args) {
demoexception obj = new demoexception();
obj.dividefunction();}}
```

Output:

```
aman@localhost:~/Downloads/LetsCodeJava-master/Lab Experiments/Experiment 7 x
File Edit View Search Terminal Help
(base) [aman@localhost Experiment 7]$ java Exception2
Enter two numbers:
2
2
1
(base) [aman@localhost Experiment 7]$ java Exception2
Enter two numbers:
2
0
A number can not be divided by 0
(base) [aman@localhost Experiment 7]$
```

Q4: On a single track two vehicles are running. As vehicles are going in same direction there is no problem. If the vehicles are running in different direction there is a chance of collision. To avoid collisions write a Java program using exception handling. You are free to make necessary assumptions.

```
import java.util.*;
class direction extends Exception{
direction(){
super("collision");
}
}
public class Exception4{
public static void main(String args[]){
Scanner sc=new Scanner(System.in);
System.out.println("enter the direction same or opposite");
String a=sc.nextLine();
try
{
if (a.equals("opposite"))
{
throw new direction();
}
}
else
{
System.out.println("no problem");
}
}
catch(direction e)
{
System.out.println(e);
}
System.out.println("try another time");
}
}
```

Output:

```
aman@localhost:~/Downloads/LetsCodeJava-master/Lab Experiments/Experiment 7 x
File Edit View Search Terminal Help
(base) [aman@localhost Experiment 7]$ javac Exception4.java
(base) [aman@localhost Experiment 7]$ java Exception4
Enter the direction here either same or opposite:
same
no problem
try another time
(base) [aman@localhost Experiment 7]$ java Exception4
Enter the direction here either same or opposite:
opposite
direction: collision
try another time
(base) [aman@localhost Experiment 7]$
```


Experiment 8

Q1: Write a program for searching strings for the first occurrence of a character or substring and for the last occurrence of a character or substring.

```
class Occurence
{
public static void main (String[] args)
{
String str = "Hey! This is Animesh Jain.";
int firstIndex = str.indexOf('s');
System.out.println("First occurrence of char 's'" + " is found at : " + firstIndex);
int lastIndex = str.lastIndexOf('s');
System.out.println("Last occurrence of char 's' is" + " found at : " + lastIndex);
int first_in = str.indexOf('s', 10);
System.out.println("First occurrence of char 's'" + " after index 10 : " + first_in);
int last_in = str.lastIndexOf('s', 20);
System.out.println("Last occurrence of char 's'" + " after index 20 is : " + last_in);
int char_at = str.charAt(20);
System.out.println("Character at location 20: " + char_at);
}
}
```

Output:

```
F:\2nd Year\4TH SEMESTER\OOPS\JAVA>java Occurence
First occurrence of char 's' is found at : 8
Last occurrence of char 's' is found at : 18
First occurrence of char 's' after index 10 : 11
Last occurrence of char 's' after index 20 is : 18
Character at location 20: 32
```

Q2: Write a program that converts all characters of a string in capital letters. (Use StringBuffer to store a string). Don't use inbuilt function.

```
class Letters{
static void convertOpposite(StringBuffer str)
{
int ln = str.length();
for (int i=0; i<ln; i++)
{
Character c = str.charAt(i);
if (Character.isLowerCase(c))
str.replace(i, i+1, Character.toUpperCase(c)+"");
else
str.replace(i, i+1, Character.toLowerCase(c)+"");
}
}

public static void main(String[] args)
{
StringBuffer str = new StringBuffer("hey how are you");
convertOpposite(str);
System.out.println(str);
}
}
```

Output:

```
F:\2nd Year\4TH SEMESTER\OOPS\JAVA>java Letters
HEY HOW ARE YOU

F:\2nd Year\4TH SEMESTER\OOPS\JAVA>
```

Q3: Write a program in Java to read a statement from console, convert it into upper case and again print on console.

```
import java.io.*;
class LettersCL
{
public static void main(String a[]) throws IOException
{
DataInputStream in=new DataInputStream(System.in);
System.out.println("Enter file Statement:");
String s1=in.readLine();
System.out.println(s1.toUpperCase());
}
}
```

Q4: Write a program in Java to create a String object. Initialize this object with your name. Find the length of your name using the appropriate String method. Find whether the character 'a' is in your name or not; if yes find the number of times 'a' appears in your name. Print locations of occurrences of 'a' .Try the same for different String objects.

```
class data
{
String name;
data(String n){ name=n; }
void disp()
{
System.out.println(" ");
System.out.println("Name :"+name);
int c=0;
int len=name.length();
for(int i=0;i<len;i++)
if(name.charAt(i)=='A'||name.charAt(i)=='a'){
c++;
System.out.println("number of occurance :"+c);
System.out.println("Possition :"+(i+1));}
if(c==0)
System.out.println("there is no 'A' available in the string");}
}
class NameLocation{
public static void main(String ar[])
{
data d1=new data("Aman Gupta");
d1.disp();
data d2=new data("Animesh Jain");
d2.disp();
}
}
```

Wrapper Class

Q1: Write a Java code that converts int to Integer, converts Integer to String, converts String to int, converts int to String, converts String to Integer converts Integer to int.

```
public class ConvertingType1
{
    public static void main(String[] args)
    {
        Integer num = new Integer(20);
        System.out.println(num.intValue());
        int c = 1234;
        String string = String.valueOf(c);
        System.out.println("String = " + string);
        String str = "123";
        int inum = 100;
        int inum2 = Integer.parseInt(str);
        int sum = inum + inum2;
        System.out.println("Result is: " + sum);
    }
}
```

Output:

```
F:\2nd Year\4TH SEMESTER\OOPS\JAVA>java ConvertingType1
20
String = 1234
Result is: 223
```

Q2: Write a Java code that converts float to Float converts Float to String converts String to float converts float to String converts String to Float converts Float to float.

```
public class ConvertingType2
{
    public static void main(String[] args)
    {
        Float fObj = new Float("78.50");
        byte b = fObj.byteValue();
        System.out.println(b);
        short s = fObj.shortValue();
        System.out.println(s);
        int i = fObj.intValue();
        System.out.println(i);
        float f = fObj.floatValue();
        System.out.println(f);
        double d = fObj.doubleValue();
        System.out.println(d);
        String si = fObj.toString();
        System.out.println(si);
    }
}
```

Output:

```
F:\2nd Year\4TH SEMESTER\OOPS\JAVA>java ConvertingType2
78
78
78
78.5
78.5
78.5
```

Experiment 9

```
aman@amanlaptop: ~/old/backup/h/StudyMaterial/2ndYear/Java/La...  
aman@amanlaptop:~/old/backup/h/StudyMaterial/2ndYear/Java/Lab/EXP9$  
aman@amanlaptop:~/old/backup/h/StudyMaterial/2ndYear/Java/Lab/EXP9$ java arraylist  
  
First  
Second  
Third  
Random  
Cloned ArrayList:[First, Second, Third, Random]  
Results after reverse operation:  
Random  
Third  
Second  
First  
aman@amanlaptop:~/old/backup/h/StudyMaterial/2ndYear/Java/Lab/EXP9$ java MyHashSet  
  
[third, first, second]  
HashSet content after adding another collection:  
[third, first, s1, second, s2]  
My HashSet content:  
[third, first, s1, second, s2]  
Clearing HashSet:  
Content After clear:  
[]  
In hashCode  
In hashCode  
In hashCode  
item: Apple price: 40  
item: Orange price: 30  
item: Banana price: 20  
In hashCode  
In equals  
Does set contains key? true
```

```
aman@amanlaptop: ~/old/backup/h/StudyMaterial/2ndYear/Java/La...
[third, first, second]
HashSet content after adding another collection:
[third, first, s1, second, s2]
My HashSet content:
[third, first, s1, second, s2]
Clearing HashSet:
Content After clear:
[]
In hashCode
In hashCode
In hashCode
item: Apple price: 40
item: Orange price: 30
item: Banana price: 20
In hashCode
In equals
Does set contains key? true
aman@amanlaptop:~/old/backup/h/StudyMaterial/2ndYear/Java/Lab/EXP9$ java MyHashMap

{third=THIRD INSERTED, first=FIRST INSERTED, second=SECOND INSERTED}
The hashmap contains value SECOND INSERTED
The hashmap does not contains value first
The hashmap contains key first
The hashmap does not contains key fifth
{third=THIRD INSERTED, first=FIRST INSERTED, second=SECOND INSERTED}
third
first
second
third ==> THIRD INSERTED
first ==> FIRST INSERTED
second ==> SECOND INSERTED
aman@amanlaptop:~/old/backup/h/StudyMaterial/2ndYear/Java/Lab/EXP9$
```

```
aman@amanlaptop: ~/old/backup/h/StudyMaterial/2ndYear/Java/La...
aman@amanlaptop:~/old/backup/h/StudyMaterial/2ndYear/Java/Lab/EXP9$ java threadand
runnable2
thread is running...
aman@amanlaptop:~/old/backup/h/StudyMaterial/2ndYear/Java/Lab/EXP9$ java oddeven
0
2
4
6
8
10
1
3
5
7
9
aman@amanlaptop:~/old/backup/h/StudyMaterial/2ndYear/Java/Lab/EXP9$
```



```
aman@amanlaptop: ~/old/backup/h/StudyMaterial/2ndYear/Java/La...
aman@amanlaptop:~/old/backup/h/StudyMaterial/2ndYear/Java/Lab/EXP9$ java threadandrunnable2
thread is running...
aman@amanlaptop:~/old/backup/h/StudyMaterial/2ndYear/Java/Lab/EXP9$ java oddeven
0
2
4
6
8
10
1
3
5
7
9
aman@amanlaptop:~/old/backup/h/StudyMaterial/2ndYear/Java/Lab/EXP9$ javac ten.java
```

```
aman@amanlaptop: ~/old/backup/h/StudyMaterial/2ndYear/Java/La...
aman@amanlaptop:~/old/backup/h/StudyMaterial/2ndYear/Java/Lab/EXP9$ java ten
Thread-0
1
Thread-7
2
Thread-6
3
Thread-3
4
Thread-5
5
Thread-1
6
Thread-2
7
Thread-4
8
```

Experiment 10

```
package jdbc;

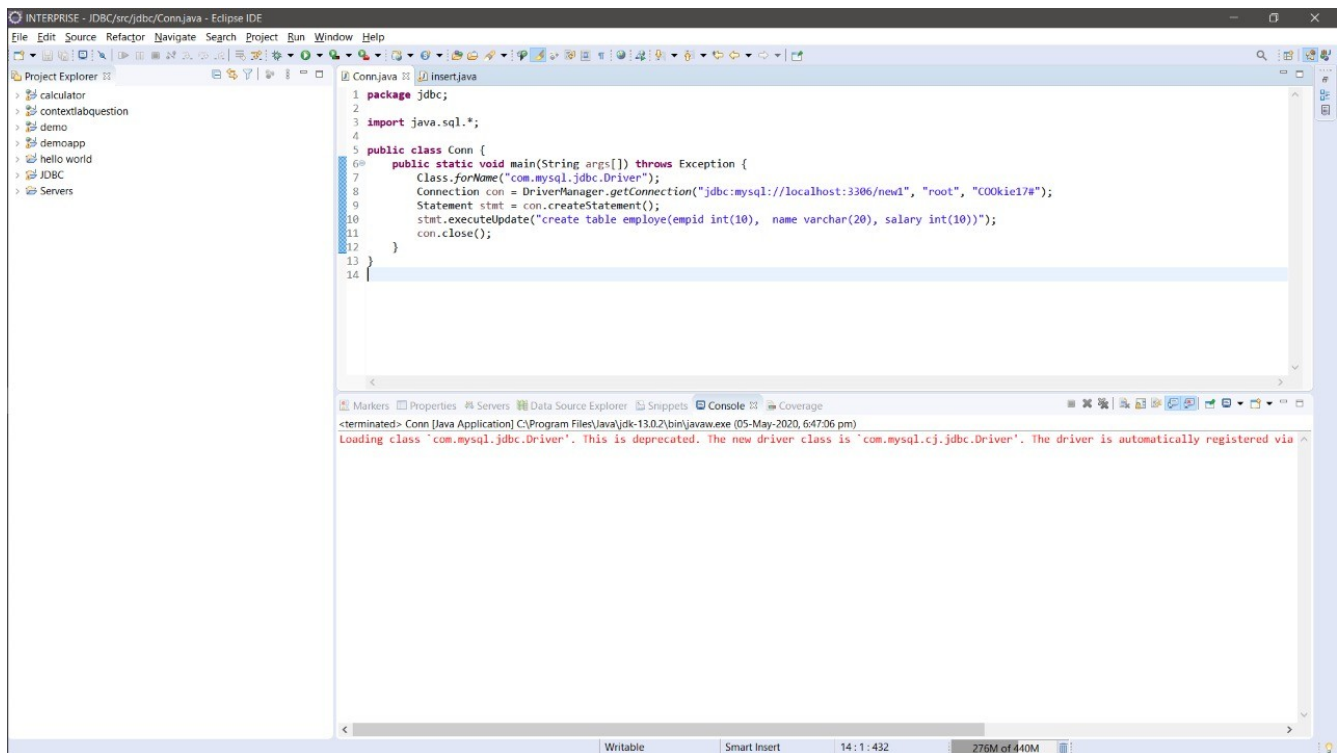
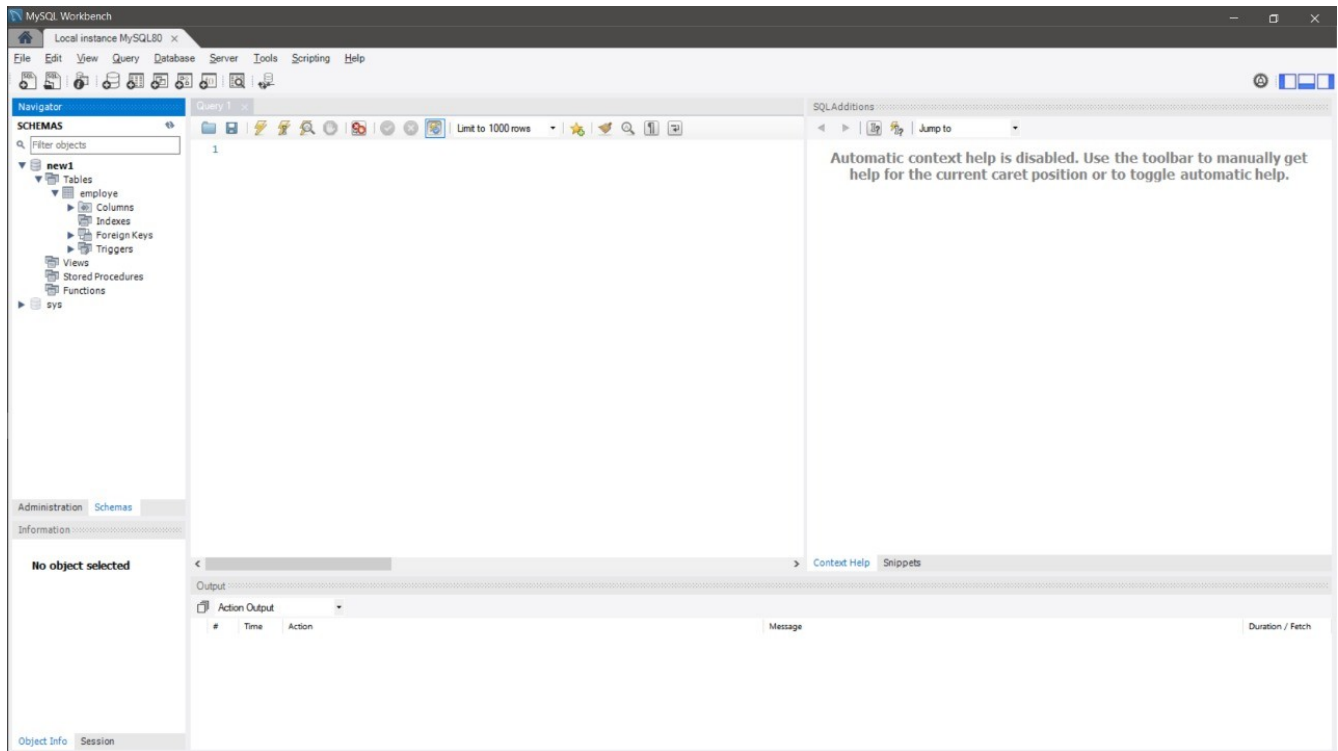
import java.sql.*;

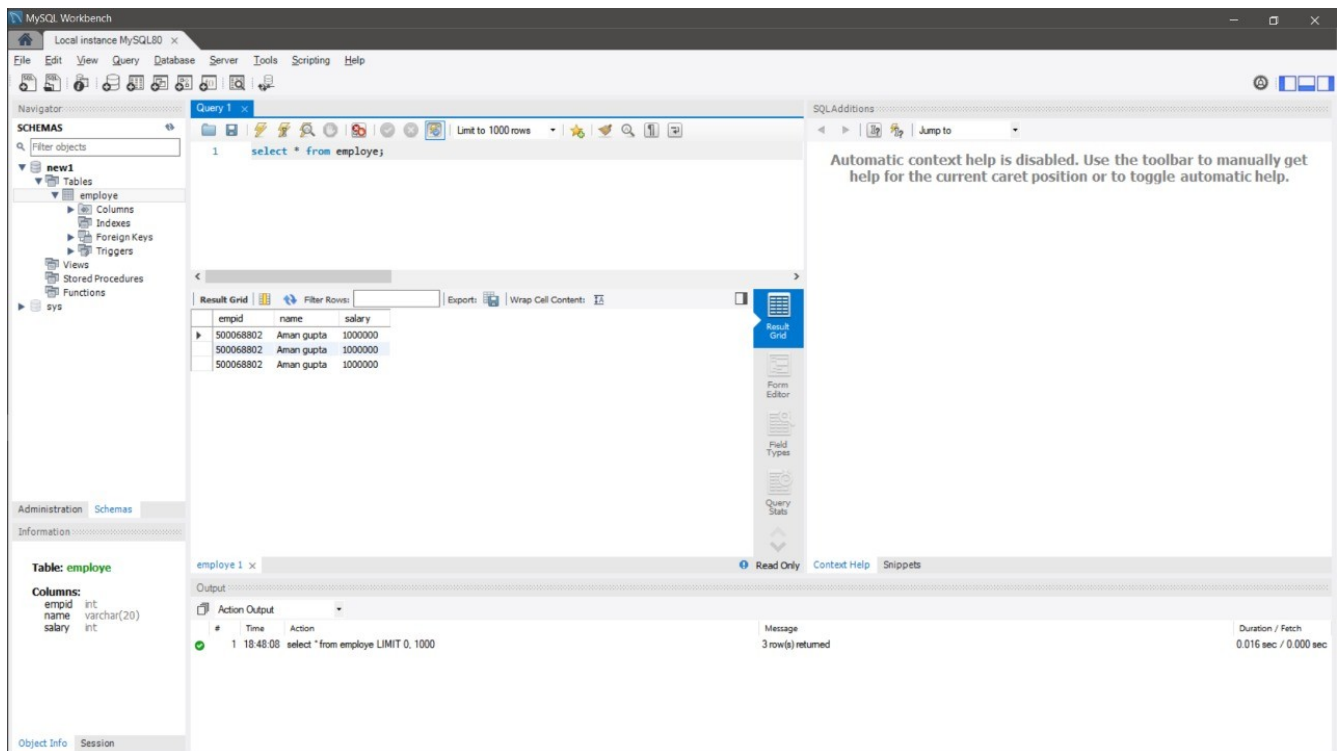
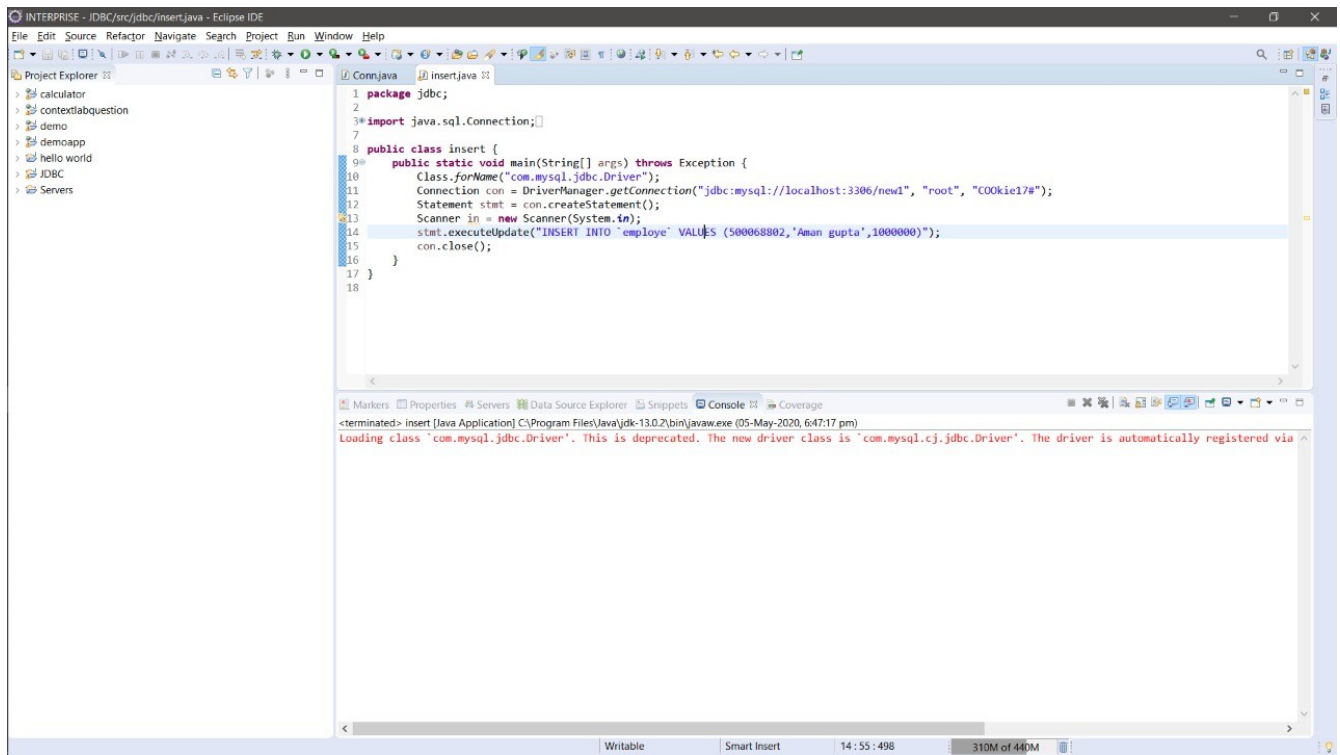
public class Conn {
    public static void main(String args[]) throws Exception {
        Class.forName("com.mysql.jdbc.Driver");
        Connection con = DriverManager.getConnection("jdbc:mysql://localhost:3306/new1",
"root", "pizza#");
        Statement stmt = con.createStatement();
        stmt.executeUpdate("create table employe(empid int(10), name varchar(20), salary
int(10))");
        con.close();
    }
}
```

```
package jdbc;

import java.sql.Connection;
import java.sql.DriverManager;
import java.sql.Statement;
import java.util.Scanner;

public class insert {
    public static void main(String[] args) throws Exception {
        Class.forName("com.mysql.jdbc.Driver");
        Connection con = DriverManager.getConnection("jdbc:mysql://localhost:3306/new1",
"root", "pizza#");
        Statement stmt = con.createStatement();
        Scanner in = new Scanner(System.in);
        stmt.executeUpdate("INSERT INTO `employe` VALUES (500067759,'Aman
gupta',1000000)");
        con.close();
    }
}
```





Experiment 11

```
package Ex11;
import java.io.*;
import javax.servlet.*;
import javax.servlet.http.*;
public class Ques1 extends HttpServlet{
    protected void service(HttpServletRequest request,HttpServletResponse response)
    throws ServletException,IOException
    {
        response.setContentType("text/html");
        PrintWriter pwriter=response.getWriter();

        String values[] = request.getParameterValues("num1");
        int addition =0;
        for(int i =0; i< values.length ; i++)
        {
            addition = addition + Integer.parseInt(values[i]);
        }
        pwriter.println("Addition is =" + addition);
        //ServletContext object creation
        ServletContext scontext=getServletContext();

        //fetching values of initialization parameters and printing it
        String userName=scontext.getInitParameter("uname");
        pwriter.println("User name is="+userName);
        String userEmail=scontext.getInitParameter("email");
        pwriter.println("Email Id is="+userEmail);
        pwriter.close();
    }
}
```

```
<!--DOCTYPE
html-->

<html>
<head>
<meta charset="ISO-8859-1">
<title>Insert title here</title>
</head>
<body>
<form action="add">
Enter first number:<input type="text"
name="num1"><br>
```

```

Enter second number:<input type="text"
name="num1"><br>
Enter third number:<input type="text"
name="num1"><br>
<input type="submit">
</form>
</body>
</html>

```

```

<?xml
version="1.0
"
encoding="UT
F-8"?>

```

```

<web-app xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
xmlns="http://xmlns.jcp.org/xml/ns/javaee"
xsi:schemaLocation="http://xmlns.jcp.org/xml/ns/javaee
http://xmlns.jcp.org/xml/ns/javaee/web-app_4_0.xsd"
version="4.0">
    <display-name>Exp11_Ques1</display-name>

    <servlet>
        <servlet-name>Ques1</servlet-name>
        <servlet-class>Ex11.Ques1</servlet-class>
    </servlet>
    <servlet-mapping>
        <servlet-name>Ques1</servlet-name>
        <url-pattern>/add</url-pattern>
    </servlet-mapping>
    <context-param>
        <param-name>uname</param-name>
        <param-value>Animesh Jain</param-value>
    </context-param>
    <context-param>
        <param-name>email</param-name>
        <param-value>500069453@stu.upes.ac.in</param-value>
    </context-param>

</web-app>

```

```

import java.io.*;
import java.util.*;
import javax.servlet.*;
import javax.servlet.http.*;

    public class Ques2 extends HttpServlet{
    public void doGet(HttpServletRequest request, HttpServletResponse
response) throws ServletException, IOException{
    PrintWriter pw = response.getWriter();
    Date today = new Date();
    pw.println("<html>"+ "<body><h1>Today's Date is</h1>");
    pw.println("<b>"+ today+"</b></body>"+ "</html>");
    }
}

```

```

<?xml
version="1.0
"
encoding="UTF-8"?>

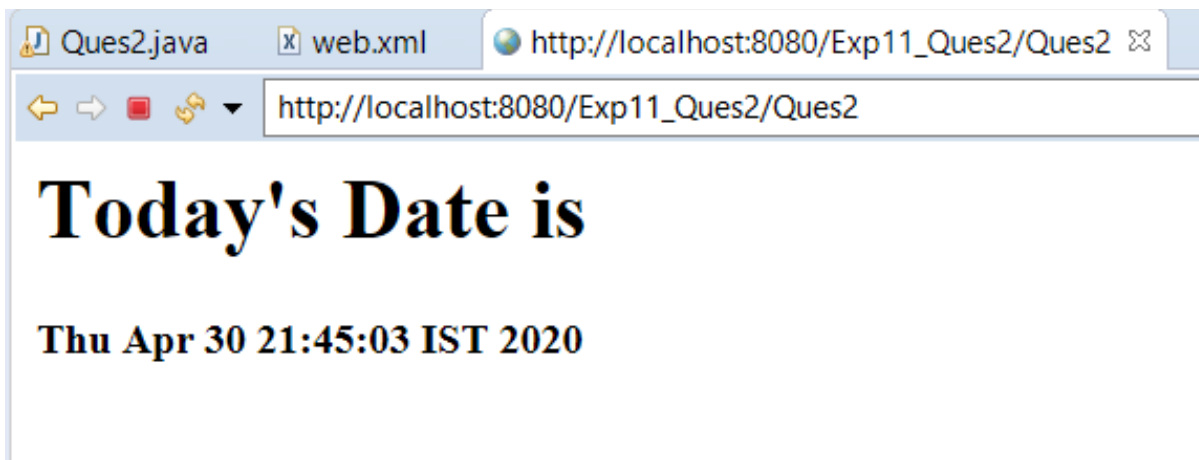
```

```

<web-app xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
xmlns="http://xmlns.jcp.org/xml/ns/javaee"
xsi:schemaLocation="http://xmlns.jcp.org/xml/ns/javaee
http://xmlns.jcp.org/xml/ns/javaee/web-app_4_0.xsd"
version="4.0">
    <display-name>Exp11_Ques2</display-name>
    <servlet>
        <servlet-name>Exp11_Ques2</servlet-name>
        <servlet-class>Ques2</servlet-class>
    </servlet>
    <servlet-mapping>
        <servlet-name>Exp11_Ques2</servlet-name>
        <url-pattern>/Ques2</url-pattern>
    </servlet-mapping>

</web-app>

```

```
package newpackage;
```

```
import java.io.IOException;  
import java.io.PrintWriter;
```

```
import javax.servlet.http.Cookie;  
import javax.servlet.http.HttpServlet;  
import javax.servlet.http.HttpServletRequest;  
import javax.servlet.http.HttpServletResponse;
```

```
public class squareclass extends HttpServlet {  
    public void service(HttpServletRequest req, HttpServletResponse res) throws IOException  
    {  
        int k=0;  
        Cookie cookies[]=req.getCookies(); //recieving cookies from first servlet  
        for(Cookie c:cookies)  
        {  
            if(c.getName().equals("k"))  
            {  
                k=Integer.parseInt(c.getValue());  
            }  
        }  
        k=k*k;  
        PrintWriter obj=res.getWriter();  
        obj.println("Square is: "+ k);  
    }  
}
```

```

package newpackage;
import java.io.IOException;
import java.io.PrintWriter;

import javax.servlet.http.Cookie;
import javax.servlet.http.HttpServlet;
import javax.servlet.http.HttpServletRequest;
import javax.servlet.http.HttpServletResponse;

public class sendRedirectmet extends HttpServlet {
    public void service(HttpServletRequest req,HttpServletResponse res) throws IOException
    {
        int i=Integer.parseInt(req.getParameter("num1"));
        int j=Integer.parseInt(req.getParameter("num2"));
        int k=i+j;
        PrintWriter obj=res.getWriter();
        obj.println("Sum is: "+ k);
        Cookie cookie=new Cookie("k",k+""); /*making new cookie so that value can be passed
through one servlet to another*/
        res.addCookie(cookie);
        res.sendRedirect("sq"); //calling square servlet
    }
}

```

```

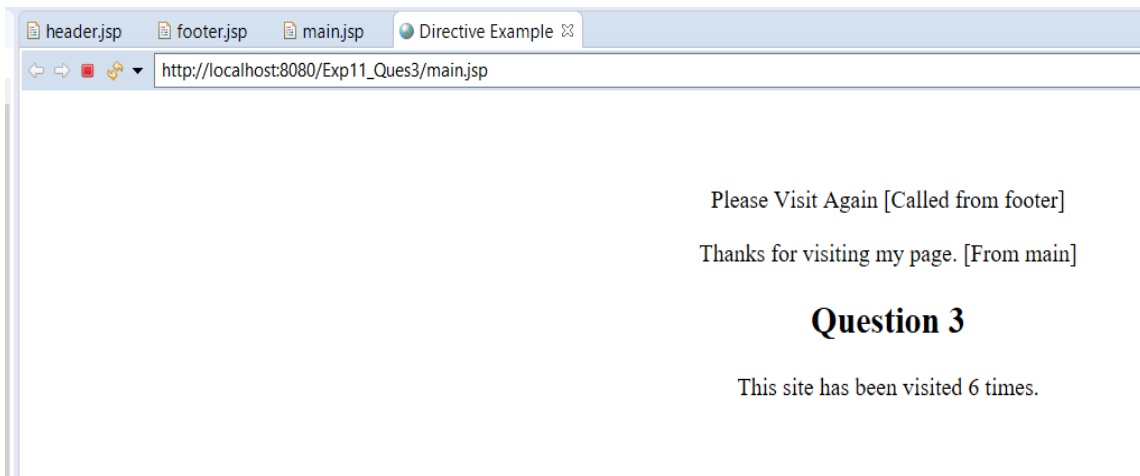
<html
>

    <head>
        <title>TODO supply a title</title>
        <meta charset="UTF-8">
        <meta name="viewport" content="width=device-width, initial-
scale=1.0">
    </head>
    <body>
        <form action="servlet1" method="get">
            number1: <input type="text" name="no1"> <br> <br>
            number2: <input type="text" name="no2"> <br> <br>
            <input type="submit" name="btnadd" value="Add">
        </form>
    </body>
</html>

```

```
<?xml
version="1.0
"
encoding="UTF-8"?>
```

```
<web-app xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
xmlns="http://xmlns.jcp.org/xml/ns/javaee"
xsi:schemaLocation="http://xmlns.jcp.org/xml/ns/javaee
http://xmlns.jcp.org/xml/ns/javaee/web-app_4_0.xsd"
id="WebApp_ID" version="4.0">
  <servlet>
    <servlet-name>httpsession</servlet-name>
    <servlet-class>newpackage.sendRedirectmethod</servlet-class>
  </servlet>
  <servlet-mapping>
    <servlet-name>httpsession</servlet-name>
    <url-pattern>/add</url-pattern>
  </servlet-mapping>
  <servlet>
    <servlet-name>session</servlet-name>
    <servlet-class>newpackage.squareclass</servlet-class>
  </servlet>
  <servlet-mapping>
    <servlet-name>session</servlet-name>
    <url-pattern>/sq</url-pattern>
  </servlet-mapping>
</web-app>
```



```
import java.io.IOException;
import java.io.PrintWriter;
import javax.servlet.ServletException;
import javax.servlet.http.HttpServlet;
import javax.servlet.http.HttpServletRequest;
import javax.servlet.http.HttpServletResponse;
```

```
public class Ques4 extends HttpServlet {
```

```
    protected void doGet(HttpServletRequest request, HttpServletResponse response)
        throws ServletException, IOException {
```

```
        PrintWriter out = response.getWriter();
        String n1 = request.getParameter("txt1");
        String n2 = request.getParameter("txt2");
        String op = request.getParameter("op");
```

```
        if(op.equals("Addition")){
            out.println(" Sum is " + ( Integer.parseInt(n1) + Integer.parseInt(n2)));
        }
```

```
        else if(op.equals("Subtraction")){
            out.println(" Difference is " + (Integer.parseInt(n1) - Integer.parseInt(n2)));
        }
```

```
        else if(op.equals("Multiplication")){
            out.println(" Product is " + (Integer.parseInt(n1) * Integer.parseInt(n2)));
        }
```

```
        else if(op.equals("Division")){
            out.println(" Quotient is " + (Integer.parseInt(n1) / Integer.parseInt(n2)));
        }
```

```
        else if(op.equals("Modulus")){
            out.println(" Remainder is " + (Integer.parseInt(n1) % Integer.parseInt(n2)));
        }
```

```
    }
```

```
}
```

```
<!
DOCTYPE
html>
```

```
<html>
<head>
<meta charset="ISO-8859-1">
<title>Simple Calculator</title>
</head>
<body>
<form action="cal" method="get">
```

Enter num1:

```
<input name="txt1" type="text" />
```

Enter num2:

```
<input name="txt2" type="text" />
```

Operator

```
<select name="op">

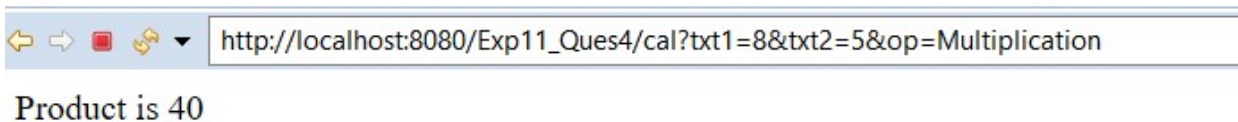
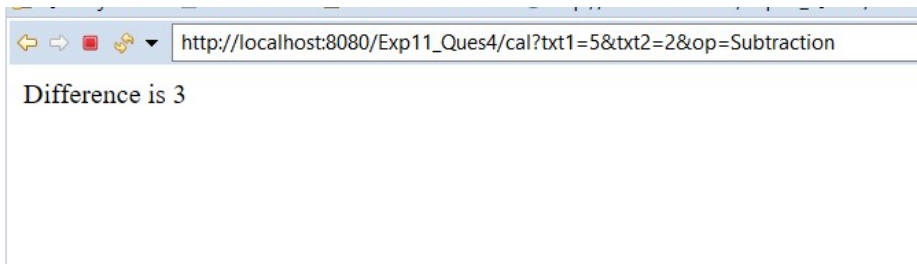
    <option value="Addition">Addition</option>
    <option value="Subtraction">Subtraction</option>
    <option
value="Multiplication">Multiplication</option>
    <option value="Division">Division</option>
    <option
value="Modulus">Modulus</option>
</select>
```

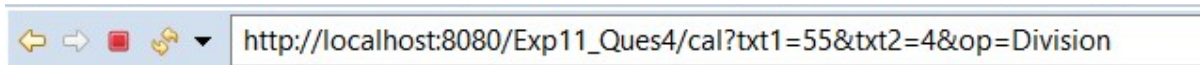
```
<input type="submit" value="submit" />
```

```
</form>
</body>
</body>
</html>
```

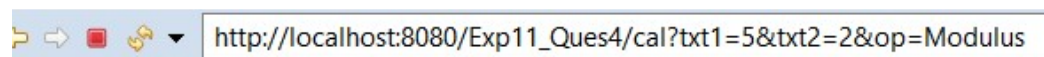
```
<?xml
version="1.0
"
encoding="UTF-8"?>
```

```
<web-app xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
xmlns="http://xmlns.jcp.org/xml/ns/javaee"
xsi:schemaLocation="http://xmlns.jcp.org/xml/ns/javaee
http://xmlns.jcp.org/xml/ns/javaee/web-app_4_0.xsd"
version="4.0">
  <display-name>Experiment11</display-name>
  <servlet>
    <servlet-name>Exp11_Ques4</servlet-name>
    <servlet-class>Ques4</servlet-class>
  </servlet>
  <servlet-mapping>
    <servlet-name>Exp11_Ques4</servlet-name>
    <url-pattern>/cal</url-pattern>
  </servlet-mapping>
  <welcome-file-list>
    <welcome-file>calculator.html</welcome-file>
  </welcome-file-list>
</web-app>
```





Quotient is 13



Remainder is 1
