**JAVA**

**Classes and Methods**

**Lab Exercise No:**14

/\*Create an object to access the addition, subtraction, multiplication and divison methods and invoke

these methods with two numbers and display the result in the corresponding methods.\*/

**package** hsbc.com.lab;

**public** **class** Calculator {

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

// **TODO** Auto-generated method stub

Calculator obj=**new** Calculator(); //creation of object

obj.add(5,4);

obj.sub(5,4);

obj.mul(5,4);

obj.div(5,4);

}

**public** **void** add(**int** a, **int** b)

{

**int** c=a+b;

System.***out***.println("Sum "+c);

}

**public** **void** sub(**int** a, **int** b)

{

**int** c=a-b;

System.***out***.println("Difference "+c);

}

**public** **void** mul(**int** a, **int** b)

{

**int** c=a\*b;

System.***out***.println("Product "+c);

}

**public** **void** div(**int** a, **int** b)

{

**double** c=a/b;

System.***out***.println("Division "+c);

}

}

**Lab Exercise No:**15

/\*program to display the no of objects created for the class or the no of times that class is instantiated\*/

**package** hsbc.com;

**public** **class** Sample {

**public** **static** **int** *count*;

Sample()//constructor

{

*count*++;//counting how many times its instantiated

}

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

// **TODO** Auto-generated method stub

Sample obj1=**new** Sample();

Sample obj2=**new** Sample();

Sample obj3=**new** Sample();

System.***out***.println(obj3.*count*);//dislaying count

}

}

**Lab Exercise No:**16

**Lab Exercise No:**17

/\*“The quick brown fox jumps over the lazy dog”.\*/

**package** hsbc.com.soln;

**public** **class** Solution17 {

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

// **TODO** Auto-generated method stub

String s="The quick brown fox jumps over the lazy dog";

System.***out***.println("Character at 12th index "+ s.charAt(11));

//checking if string contains 'is'

String word="";

**boolean** flag=**false**;

**for**(**int** i=0;i<s.length();i++)

{

**char** ch=s.charAt(i);

**if**(Character.*isLetter*(ch))

{

word=word+ch;

}

**else**

{

**if**(word.equals("is"))

{

System.***out***.println("Contains 'is'");

flag=**true**;

**break**;

}

**else**

{

word="";

}

}

}

**if** (flag==**false**)

System.***out***.println("Doesn not contain 'is'");

//adding 'and killed it' to existing string

String a=s+" and killed it";

System.***out***.println("After appending: "+a);

//checking if string ends with dogs

word="";

**for**(**int** i=s.length()-1;i<s.length();i--)

{

**char** ch=s.charAt(i);

**if**(Character.*isLetter*(ch))

{

word=ch+word;

}

**else**

{

**if**(word.equals("dog"))

{

System.***out***.println("Ends with 'dog'");

**break**;

}

**else**

{

System.***out***.println("Does not end with 'dog'");

}

}

}

// Checking whether the String is equal to “The quick brown Fox jumps over the lazy Dog”

**if**(s.compareTo("The quick brown Fox jumps over the lazy Dog")==0)

System.***out***.println("Equal");

**else**

System.***out***.println("Not Equal");

//Checking whether the String is equal to “THE QUICK BROWN FOX JUMPS OVER THE LAZY DOG”

**if**(s.compareTo("THE QUICK BROWN FOX JUMPS OVER THE LAZY DOG")==0)

System.***out***.println("Equal");

**else**

System.***out***.println("Not Equal");

//Finding the index position of the character a

System.***out***.println(s.indexOf("a"));

//Finding the last index position of the character “e”

System.***out***.println(s.lastIndexOf("e"));

//Finding the length of the String.

System.***out***.println(s.length());

//Checking whether the String matches to “The quick brown Fox jumps over the lazy Dog”

**if**(s.compareTo("The quick brown Fox jumps over the lazy Dog")==0)

System.***out***.println("Equal");

**else**

System.***out***.println("Not Equal");

//Replacing the word “The” with the word “A”

word="";

String t="";

**for**(**int** i=0;i<s.length();i++)

{

**char** ch=s.charAt(i);

**if**(Character.*isLetter*(ch))

{

word=word+ch;

}

**else**

{

**if**(word.equals("The")||word.equals("the"))

{

t=t+" A";

word="";

}

**else**

{

t=t+" "+word;

word="";

}

}

}

System.***out***.println("After replacing "+ t);

//Splitting the above string into two such that two animal names do not come together

String d[]=s.split(" ",s.length());

System.***out***.println("After splitting");

**for**(**int** i=0;i<d.length;i++)

{

System.***out***.println(d[i]);

}

//Printing the animal names alone separately from the above string

t=s+" ";

word="";

System.***out***.println("Animal Names");

**for**(**int** i=0;i<t.length();i++)

{

**char** ch=t.charAt(i);

**if**(Character.*isLetter*(ch))

{

word=word+ch;

}

**else**

{

**if**(word.equals("fox")||word.equals("dog"))

{

System.***out***.println(word);

word="";

}

**else**

{

word="";

}

}

}

//Printing the above string in completely lower case

System.***out***.println("String in lowercase: "+s.toLowerCase());

//Printing the above string in completely upper case

System.***out***.println("String in uppercase: "+s.toUpperCase());

}

}

**Lab Exercise No:**18

/\*Write a program to demonstrate the difference between equals and == operator with

appropriate example\*/

**package** hsbc.com.soln;

**public** **class** Solution18 {

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

// **TODO** Auto-generated method stub

String p1=**new** String("abc");

String p2=**new** String("abc");

//String p3=p2;

//String p3="xyz";

**if**(p1==p2)

System.***out***.println("references are equal");

**if**(p1.equals(p2))

System.***out***.println("Equal");

}

}

**Lab Exercise No:**19

/\*Write a program to declare an array with 8 elements and copy the 8 elements into another

array and display the same.\*/

**package** hsbc.com.soln;

**public** **class** Array {

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

// **TODO** Auto-generated method stub

**int** arr[]= {3,5,2,6,65,75,23,13};

**int** brr[]=**new** **int**[arr.length];

**for**(**int** i=0;i<arr.length;i++)

brr[i]=arr[i];

System.***out***.println("Displaying the elements");

**for**(**int** i=0;i<arr.length;i++)

System.***out***.println(brr[i]);

}

}

**Lab Exercise No:**20

/\*Write a program to display the sum and the average of elements in the array.\*/

**package** hsbc.com.soln;

**public** **class** SumAndAvg {

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

// **TODO** Auto-generated method stub

**int** arr[]= {3,5,2,6,65,75,23,13};

**int** sum =0;

**double** avg=0;

**for**(**int** i=0;i<arr.length;i++)

sum=sum+arr[i];

System.***out***.println("Sum: "+sum+" "+"Average: "+(sum/arr.length));

}

}

**Lab Exercise No:**21

/\*Write a program to construct two matrices and display the sum of those.\*/

**package** hsbc.com.soln;

**public** **class** Matrix {

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

// **TODO** Auto-generated method stub

**int** arr[][]= {{3,4,2},{56,7,24}};

**int** brr[][]= {{45,6,3},{7,5,1}};

System.***out***.println("array 1");

**for**(**int** i=0;i<arr.length;i++)

{

**for**(**int** j=0;j<arr.length;j++)

{

System.***out***.print(arr[i][j]+" ");

}

System.***out***.println();

}

System.***out***.println("array 2");

**for**(**int** i=0;i<brr.length;i++)

{

**for**(**int** j=0;j<brr.length;j++)

{

System.***out***.print(brr[i][j]+" ");

}

System.***out***.println();

}

//sum

**for**(**int** i=0;i<arr.length;i++)

{

**for**(**int** j=0;j<arr.length;j++)

{

arr[i][j]=arr[i][j]+brr[i][j];

}

}

System.***out***.println("Sum");

**for**(**int** i=0;i<arr.length;i++)

{

**for**(**int** j=0;j<arr.length;j++)

{

System.***out***.print(arr[i][j]+" ");

}

System.***out***.println();

}

}

}

**Lab Exercise No:**22

/\*Write a program to display the square of the elements of a two dimensional array.\*/

**package** hsbc.com.soln;

**import** java.io.\*;

**public** **class** Square {

**public** **static** **void** main(String[] args)**throws** IOException{

InputStreamReader read=**new** InputStreamReader(System.***in***);

BufferedReader buf=**new** BufferedReader(read);

System.***out***.println("Enter n value");

**int** n=Integer.*parseInt*(buf.readLine());

System.***out***.println("Enter values");

// **TODO** Auto-generated method stub

**int** arr[][]=**new** **int**[n][n];

**for**(**int** i=0;i<arr.length;i++)

{

**for**(**int** j=0;j<arr.length;j++)

{

arr[i][j]=Integer.*parseInt*(buf.readLine());

}

System.***out***.println();

}

**for**(**int** i=0;i<arr.length;i++)

{

**for**(**int** j=0;i<arr.length;j++)

{

arr[i][j]=arr[i][j]\*arr[i][j];

}

System.***out***.println();

}

System.***out***.println("Final array");

**for**(**int** i=0;i<arr.length;i++)

{

**for**(**int** j=0;j<arr.length;j++)

{

System.***out***.print(arr[i][j]+" ");

}

System.***out***.println();

}

}

}

**Lab Exercise No:**23

/\*Write a program to construct an array with 10 elements and to find the number of

occurrences of each element in the Array.\*/

**package** hsbc.com.soln;

**public** **class** Occurrences {

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

// **TODO** Auto-generated method stub

**int** arr[]= {4,6,2,4,3,5,7,8,5,4};

**int** f=1;

**for**(**int** i=0;i<arr.length-1;i++)

{

**for**(**int** j=i+1;j<arr.length;j++)

{

**if**(arr[i]!=-999)

{

**if**(arr[i]==arr[j] && arr[j]!=-999)

{

f++;

arr[j]=-999;

}

**else**

{

**continue**;

}

}

}

**if**(arr[i]!=-999)

{

System.***out***.println(arr[i]+" has occurred "+f+" times");

f=1;

}

}

}

}

**Lab Exercise No:**24

/\*Overload the area and perimeter method to calculate for both square and rectangle.

Create a main class and invoke the area method to calculate the area of the square and

rectangle. Also invoke the perimeter method to calculate the perimeter of the square

and rectangle.\*/

package hsbc.com.soln;

public class Shape {

public static void main(String[] args) {

// TODO Auto-generated method stub

Shape obj=new Shape();

obj.area(5);

obj.area(5,20);

obj.perimeter(6);

obj.perimeter(5,10);

}

public static void area(int a)

{

System.out.println("Area of square :"+a\*a);

}

public static void area(int a, int b)

{

System.out.println("Area of rectanlge :"+a\*b);

}

public static void perimeter(int x, int y)

{

System.out.println("Perimeter of rectangle :"+2\*(x+y));

}

public static void perimeter(int x)

{

System.out.println("Perimeter of square :"+x+x);

}

}

**Lab Exercise No:**25

/\*Constructor Overloading\*/

**package** hsbc.com.soln;

**public** **class** Employee {

**private** **static** String *empName*;

**private** **static** **int** *empId*;

**private** **static** **int** *empAge*;

**private** **static** String *empDesign*;

**private** **static** String *empLocation*;

**private** **static** **int** *empExpInYrs*;

Employee(String empName)

{

**this**.*empName*=empName;

*empId*=3;

*empAge*=22;

*empDesign*="TSE";

*empLocation*="Pune";

*empExpInYrs*=0;

}

Employee(String empName,**int** empId)

{

**this**.*empName*=empName;

**this**.*empId*=empId;

*empAge*=22;

*empDesign*="TSE";

*empLocation*="Pune";

*empExpInYrs*=0;

}

Employee(String empName,**int** empId,**int** empAge)

{

**this**.*empName*=empName;

**this**.*empId*=empId;

**this**.*empAge*=empAge;

*empDesign*="TSE";

*empLocation*="Pune";

*empExpInYrs*=0;

}

Employee(String empName,**int** empId,String empDesign )

{

**this**.*empName*=empName;

**this**.*empId*=empId;

**this**.*empDesign*=empDesign;

**int** empAge=22;

*empLocation*="Pune";

*empExpInYrs*=0;

}

Employee(String empName,**int** empId,**int** empAge,String empDesign )

{

**this**.*empName*=empName;

**this**.*empId*=empId;

**this**.*empAge*=empAge;

**this**.*empDesign*=empDesign;

*empLocation*="Pune";

*empExpInYrs*=0;

}

Employee(String empName,**int** empId,String empDesign,String empExpInYrs)

{

**this**.*empName*=empName;

**this**.*empId*=empId;

**this**.*empDesign*=empDesign;

**this**.*empExpInYrs*=empExpInYrs;

*empAge*=22;

*empLocation*="Pune";

}

Employee(String empName,**int** empId,String empDesign,String empLocation,String empExpInYrs)

{

**this**.*empName*=empName;

**this**.*empId*=empId;

**this**.*empDesign*=empDesign;

**this**.*empLocation*=empLocation;

**this**.*empExpInYrs*=empExpInYrs;

*empAge*=22;

}

Employee(String empName,**int** empId,**int** empAge,String empDesign,String empLocation,String empExpInYrs )

{

**this**.*empName*=empName;

**this**.*empId*=empId;

**this**.*empAge*=empAge;

**this**.*empDesign*=empDesign;

**this**.*empLocation*=empLocation;

**this**.*empExpInYrs*=empExpInYrs;

}

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

// **TODO** Auto-generated method stub

Employee obj=**new** Employee();

obj.Employee("Tanisha");

obj.Employee("Tanisha",1);

obj.Employee("Tanisha",1,22);

obj.Employee("Tanisha",1,"TSE");

obj.Employee("Tanisha",1,22,"TSE");

obj.Employee("Tanisha",1,22,"Pune");

obj.Employee("Tanisha",1,22,0);

obj.Employee("Tanisha",1,"TSE",0);

obj.Employee("Tanisha",1,"TSE","Pune",0);

obj.Employee("Tanisha",1,22,"TSE","Pune",0);

}

}

**Lab Exercise No:**26

/\*Create a class called Calculator which has 4 different methods add, diff, mul and div which

accepts two numbers as parameters. Overload the methods such that the parameters can be

of the following pattern.

1. Both are of int data type.

2. Both are of double data type.

3. First parameter is of int data type and second parameter is of double data type.

4. First parameter is of double data type and second parameter is of int data type.

Create an object to access these methods and invoke these methods with different type of

numbers and display the result in the corresponding methods.\*/

**package** hsbc.com.soln;

**public** **class** Calculator {

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

// **TODO** Auto-generated method stub

**int** a = 25;

**int** b = 50;

**double** c = 76.375;

**double** d = 150.553;

Calculator cal = **new** Calculator();

cal.add(a, b);

cal.add(c, d);

cal.add(c, a);

cal.add(b, d);

cal.diff(a, b);

cal.diff(c, d);

cal.diff(c, a);

cal.diff(b, d);

cal.mul(a, b);

cal.mul(c, d);

cal.mul(c, a);

cal.mul(b, d);

cal.div(a, b);

cal.div(c, d);

cal.div(c, a);

cal.div(b, d);

}

**public** **void** add(**int** a, **int** b) {

System.***out***.println("The sum of a and b is " + (a+b));

}

**public** **void** add(**double** a, **double** b) {

System.***out***.println("The sum of c and d is " + (a+b));

}

**public** **void** add(**double** a, **int** b) {

System.***out***.println("The sum of c and a is " + (a+(**double**)b));

}

**public** **void** add(**int** a, **double** b) {

System.***out***.println("The sum of b and d is " + (b+(**double**)a));

}

**public** **void** diff(**int** a, **int** b) {

System.***out***.println("The difference of a and b is " + (a-b));

}

**public** **void** diff(**double** a, **double** b) {

System.***out***.println("The difference of c and d is " + (a-b));

}

**public** **void** diff(**double** a, **int** b) {

System.***out***.println("The difference of c and a is " + (a-(**double**)b));

}

**public** **void** diff(**int** a, **double** b) {

System.***out***.println("The difference of b and d is " + ((**double**)a-b));

}

**public** **void** mul(**int** a, **int** b) {

System.***out***.println("The product of a and b is " + (a\*b));

}

**public** **void** mul(**double** a, **double** b) {

System.***out***.println("The product of c and d is " + (a\*b));

}

**public** **void** mul(**double** a, **int** b) {

System.***out***.println("The product of c and a is " + (a\*(**double**)b));

}

**public** **void** mul(**int** a, **double** b) {

System.***out***.println("The product of b and d is " + ((**double**)a\*b));

}

**public** **void** div(**int** a, **int** b) {

**try** {

**float** c = (**float**)a/b;

System.***out***.println("The division of a and b is " + c);

}

**catch**(ArithmeticException e)

{

System.***out***.println("Message: " + e);

}

}

**public** **void** div(**double** a, **double** b) {

**try** {

**double** c = a/b;

System.***out***.println("The division of c and d is " + c);

}

**catch**(ArithmeticException e)

{

System.***out***.println("Message: " + e);

}

}

**public** **void** div(**int** a, **double** b) {

**try** {

**double** c = (**double**)a/b;

System.***out***.println("The division of b and d is " + c);

}

**catch**(ArithmeticException e)

{

System.***out***.println("Message: " + e);

}

}

**public** **void** div(**double** a, **int** b) {

**try** {

**double** c = a/(**double**)b;

System.***out***.println("The division of c and a is " + c);

}

**catch**(ArithmeticException e)

{

System.***out***.println("Message: " + e);

}

}

}

**Lab Exercise No:**28

/\*In the calculator (Lab exercise - 14) program, make the add and diff method to accept var-args

and demonstrate.\*/

**package** hsbc.com.soln;

**public** **class** Solution28 {

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

// **TODO** Auto-generated method stub

*var*("Tanisha",3,10);

*var*("Hello",1,20,5,7);

}

**public** **static** **void** var(String name,**int**...t)

{

System.***out***.println("Name: "+name);

System.***out***.println("Arguments: "+t.length);

**for**(**int** i=0;i<t.length;i++)

{

System.***out***.println(i+" ");

}

}

}