

ATRIA INSTITUTE OF TECHNOLOGY

DEPARTMENT OF INFORMATION SCIENCE & ENGINEERING

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“OBJECT ORIENTED PROGRAMMING WITH JAVA LABORATORY MANUAL”

21CSL35

As per NEP Syllabus



Part-A

SI_NO	Program title
1	Quadratic equation $ax^2+bx+c=0$
2	Create n student objects and print student's details
3	a. Check prime number
	b. Arithmetic calculator using switch case
4	Demonstrate the concepts of Inheritance -Super Class
5	Demonstrating method overloading and constructor overloading
6	Java application to implement Currency Converter, Distance Converter and Time Converter
7	Java program to generate the resume
8	Java program that implements a multi thread application that has three threads.
9	Program to perform string operations using arraylist.
10	Java program to read two integers a and b. compute a/b and print when b is not zero.
11	Java program that reads a file name from the user, Displays file readable or writable and length of file in bytes.
12	a. Develop an applet that displays a simple message in centre of the screen
	b. Develop a simple calculator using swings.
PART B – Practical Based Learning	
01	A problem statement for each batch is to be generated in consultation with the co-examiner and student should develop an algorithm, program and execute the program for the given problem with appropriate outputs.

1. Write a java program that prints all real solutions to quadratic equation $ax^2+bx+c=0$. Read in a, b, c and quadratic formula.

```
package labPrograms;
import java.util.Scanner;
import java.lang.*;
public class OOP1 {
public static void main(String[] args) {
    int a,b,c,d;
    double x1,x2;
    Scanner sc=new Scanner(System.in);
    System.out.println("entre the values of a,b,c");
    a=sc.nextInt();
    b=sc.nextInt();
    c=sc.nextInt();
    d=(b*b-4*a*c);
    if(d==0){
        x1=x2=-b/(2*a);
        System.out.println("the roots are"+" and "+x2); }
    else if(d>0){
        x1=-b+Math.sqrt(d)/(2*a);
        x2=-b-Math.sqrt(d)/(2*a);
        System.out.println("the roots are"+x1+" and "+x2);}
    else {
        System.out.println("the roots are imaginary");}
    }
}
```

Output:

```
entre the values of a,b,c
2
3
4
the roots are imaginary
```

```
entre the values of a,b,c
2
7
1
the roots are-5.399218940641788 and -8.600781059358212
```

2. Write a java program to create n student objects and print the USN, Name, Branch and Phone of these objects with suitable headings.

```
package labPrograms;
import java.util.Scanner;

class student {
    String name;
    String usn;
    String branch;
    long phone;
    void display()
    {
        System.out.println(" name is: "+name);
        System.out.println(" usn is: "+usn);
        System.out.println(" branch is: "+branch);
        System.out.println(" phone is: "+phone);
    }
}

public class OOP2 {

    public static void main(String[] args) {
        // TODO Auto-generated method stub
        int n;
        student s[]=new student[100];
        Scanner sc=new Scanner(System.in);
        System.out.println("enter the no of students ");
        n=sc.nextInt();
        for(int i=1;i<=n;i++)
        {
            s[i]=new student();
            System.out.println("enter the name ");
            s[i].name=sc.next();
            System.out.println("enter the usn ");
            s[i].usn=sc.next();
            System.out.println("enter the branch ");
            s[i].branch=sc.next();
            System.out.println("enter the phone ");
            s[i].phone=sc.nextLong();
        }
        System.out.println("student details ");
        for(int i=1;i<=n;i++)
        {
            System.out.println("details of student: "+i);
            s[i].display();
        }
    }
}
```

Output:

```
enter the no of students
3
enter the name
samarth
enter the usn
IS22
enter the branch
IS
enter the phone
34352
enter the name
sushanth
enter the usn
IS23
enter the branch
IS
enter the phone
12413
enter the name
ram
enter the usn
IS24
enter the branch
```

```
enter the branch
IS
enter the phone
12413
enter the name
ram
enter the usn
IS24
enter the branch |
IS
enter the phone
53464
student details
details of student: 1
  name is: samarth
  usn is: IS22
  branch is: IS
  phone is: 34352
details of student: 2
  name is: sushanth
  usn is: IS23
  branch is: IS
  phone is: 12413
details of student: 3
  name is: ram
  usn is: IS24
  branch is: IS
  phone is: 53464
```

3. a. Write a program to check prime number.

```
package labPrograms;
import java.util.Scanner;

public class OOP3a {
    public static void main(String[] args) {
        // TODO Auto-generated method stub
        int n,m,flag=0;
        Scanner sc=new Scanner(System.in);
        System.out.println("enter the number ");
        n=sc.nextInt();
        m=n/2;
        if(n==0||n==1){
            System.out.println(n+" is not prime number");
        }
        else{
            for(int i=2;i<=m;i++){
                if(n%i==0){
                    System.out.println(n+" is not prime number");
                    flag=1;
                    break;
                }
            }
            if(flag==0) { System.out.println(n+" is prime number"); }
        } //end of else
    }
}
```

Output:

```
enter the number
27
|27 is not prime number
```

```
enter the number
29
|29 is prime number
```

3. b. write a program for arithmetic calculator using switch case menu.

```
package labPrograms;
import java.util.Scanner;

public class OOP3b {

    public static void main(String[] args) {
        // TODO Auto-generated method stub
        // TODO Auto-generated method stub
        char oper;
        double op1,op2,res;
        Scanner sc=new Scanner(System.in);
        System.out.println("enter the operator: +,-,*,/,%");
        oper=sc.next().charAt(0);
        System.out.println("enter the operand1 ");
        op1=sc.nextDouble();
        System.out.println("enter the operand2 ");
        op2=sc.nextInt();
        switch(oper) {
            case '+':res=op1+op2;
                System.out.println("The sum of two numbers is: "+res);
                break;
            case '-':res=op1-op2;
                System.out.println("The difference of two numbers is: "+res);
                break;
            case '*':res=op1*op2;
                System.out.println("The product of two numbers is: "+res);
                break;
            case '/':res=op1/op2;
                System.out.println("The division of two numbers is: "+res);
                break;
            case '%':res=op1%op2;
                System.out.println("The modulus of two numbers is: "+res);
                break;
            default: System.out.println("wrong operator ");
                break;
        } }
    }
```

Output:

```
enter the operator: +,-,*,/,%
+
enter the operand1
2
enter the operand2
3
The sum of two numbers is: 5.0
```

```
enter the operator: +,-,*,/,%
-
enter the operand1
4
enter the operand2
2
The difference of two numbers is: 2.0
```

```
enter the operator: +,-,*,/,%
*
enter the operand1
4
enter the operand2
3
The product of two numbers is: 12.0
```

4. Design a superclass called staff with details as staffid, name, phone, salary. Extend this class by writing three subclasses namely Teaching and contract period. Write a java program to read and display at least three staff objects of all three categories.

```
package labPrograms;

import java.util.Scanner;

class staff_college
{
    String staffid;
    String name;
    String phone;
    double salary;
}

class teaching extends staff_college
{
    String domain;
    String publications;
    void display(String dom,String pub)
    {
        domain=dom;
        publications=pub;
        System.out.println(" the Teacher details ");
        System.out.println("staffid: "+staffid);
        System.out.println("name: "+name);
        System.out.println("phone: "+phone);
        System.out.println("salary: "+salary);
        System.out.println("domain: "+domain);
        System.out.println("publications: "+publications);
    }
}

class technical extends staff_college
{
    String skills;
    void display(String skills)
    {
        System.out.println(" the Technical staff details ");
        System.out.println("staffid: "+staffid);
        System.out.println("name: "+name);
        System.out.println("phone: "+phone);
        System.out.println("salary: "+salary);
        System.out.println("skills: "+skills);
    }
}
}
```



```
class contract extends staff_college
{
    String period;
    void display(String per)
    {
        System.out.println(" the Contract staff details ");
        System.out.println("staffid: "+staffid);
        System.out.println("name: "+name);
        System.out.println("phone: "+phone);
        System.out.println("salary: "+salary);
        System.out.println("period: "+period);
    }
}
```

```
public class OOP4 {
    public static void main(String[] args) {
        String dom, pub, skills, per;
        staff_college s=new staff_college();
        teaching t1=new teaching();
        technical t2=new technical();
        contract t3=new contract();
        Scanner sc=new Scanner(System.in);
        System.out.println("enter the Teacher details ");
        System.out.println("enter staff id of the staff: ");
        t1.staffid=sc.next();
        System.out.println("enter name of the staff: ");
        t1.name=sc.next();
        System.out.println("enter phone of the staff: ");
        t1.phone=sc.next();
        System.out.println("enter salary of the staff: ");
        t1.salary=sc.nextDouble();
        System.out.println("enter domain of the staff: ");
        dom=sc.next();
        System.out.println("enter publications of the staff: ");
        pub=sc.next();
        System.out.println("enter the Technical staff details ");
        System.out.println("enter staff id of the staff: ");
        t2.staffid=sc.next();
        System.out.println("enter name of the staff: ");
        t2.name=sc.next();
        System.out.println("enter phone of the staff: ");
        t2.phone=sc.next();
        System.out.println("enter salary of the staff: ");
        t2.salary=sc.nextDouble();
        System.out.println("enter skills of the staff: ");
        skills=sc.next();
        System.out.println("enter the contractor details ");
        System.out.println("enter staff id of the staff: ");
        t3.staffid=sc.next();
        System.out.println("enter name of the staff: ");
        t3.name=sc.next();
        System.out.println("enter phone of the staff: ");
        t3.phone=sc.next();
    }
}
```

```
System.out.println("enter salary of the staff: ");
t3.salary=sc.nextDouble();
System.out.println("enter period : ");
per=sc.next();
t1.display(dom,pub);
t2.display(skills);
t3.display(per);
}
}
```

Output:

```
enter the Teacher details
enter staff id of the staff:
S11
enter name of the staff:
Rama
enter phone of the staff:
2124
enter salary of the staff:
45000
enter domain of the staff:
IS
enter publications of the staff:
4
enter the Technical staff details
enter staff id of the staff:
T11
enter name of the staff:
rishi
enter phone of the staff:
21312
enter salary of the staff:
34000
enter skills of the staff:
finance
```

```
enter the contractor details
enter staff id of the staff:
C11
enter name of the staff:
greeshma
enter phone of the staff:
14134
enter salary of the staff:
23000
enter period :
4
| the Teacher details
staffid: S11
name: Rama
phone: 2124
salary: 45000.0
domain: IS
publications: 4
  the Technical staff details
staffid: T11
name: rishi
phone: 21312
salary: 34000.0
skills: finance
  the Technical staff details
staffid: C11
name: greeshma
phone: 14134
salary: 23000.0
period: null
```

5. Write a java program demonstrating method overloading and constructor overloading.

```
package labPrograms;

class constructor_area
{
    int length,breadth;
    void area()
    {
        System.out.println("This is Method overloading");
    }
    void area(int s)
    {
        int a;
        a=s*s;
        System.out.println("the side of a square is"+" "+s);
        System.out.println("The area of a square under method overloading is:"+a);
    }
    void area(int l,int b)
    {
        int a;
        a=l*b;
        System.out.println("the length and breadth of a rectangle is"+" "+l+" "+b);
        System.out.println("The area of a rectangle under method overloading is:"+a);
    }
    constructor_area()
    {
        System.out.println("This is a Constructor overloading");
    }
    constructor_area(int s)
    {
        int a;
        a=s*s;
        System.out.println("the side of a square is"+" "+s);
        System.out.println("The area of a square under constructor overloading is:"+a);
    }
    constructor_area(int l,int b)
    {
        int a;
        length=l;
        breadth=b;
        System.out.println("the length and breadth of a rectangle is"+" "+length+"
        "+breadth);
        a=length*breadth;
        System.out.println("The area of rectangle under constructor overloading is:
        "+a);
    }
}
```

```
public class OOP5 {  
  
    public static void main(String[] args) {  
        // TODO Auto-generated method stub  
        constructor_area c=new constructor_area();  
        constructor_area c1=new constructor_area(2,3);  
        constructor_area c2=new constructor_area(3);  
        c.area();  
        c.area(4);  
        c.area(4,5);  
  
    }  
  
}
```

Output:

```
This is a Constructor overloading  
the length and breadth of a rectangle is 2 3  
The area of rectangle under constructor overloading is: 6  
the side of a square is 3  
The area of a square under constructor overloading is:9  
This is Method overloading  
the side of a square is 4  
The area of a square under method overloading is:16  
the length and breadth of a rectangle is 4 5  
The area of a rectangle under method overloading is:20
```

6. Develop a java application to implement currency converter (Dollar to INR, yen to INR, euro to INR and vice versa), distance converter (meter to km, miles to km viceversa) time converter (hours to min, sec and viceversa) using packages.

```
package labPrograms;
import java.util.*;
import java.text.DecimalFormat;
import java.lang.*;
public class OOP6 {
public static void main(String[] args) {
    // TODO Auto-generated method stub
    int ch;
    double rupee,dollar,code,euro,yen,kilometer,meter,miles,hours,min,sec;
    DecimalFormat f = new DecimalFormat("##.###");
    Scanner sc = new Scanner(System.in);
    while(true) {
        System.out.println("Enter your choice for conversion: \n1:currency converter \t2:Distance converter
\t3:Time converter\t 4:exit\n");
        ch=sc.nextInt();
        switch(ch) {
            case 1:
                System.out.println("Enter amount in dollar to convert into rupee:");
                dollar = sc.nextFloat();
                rupee = dollar * 75;
                System.out.println("Rupees : "+f.format(rupee));
                System.out.println("Enter amount in Euro to convert into rupee:");
                euro = sc.nextFloat();
                rupee = euro * 84;
                System.out.println("Rupees : "+f.format(rupee));
                System.out.println("Enter amount in YEN to convert into rupee:");
                yen = sc.nextFloat();
                rupee = yen /0.59;
                System.out.println("Rupees : "+f.format(rupee));
```

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```
System.out.println("Enter amount in INR to convert to Dollar:");
rupee = sc.nextFloat();
dollar = rupee / 75;
System.out.println("Dollar : "+f.format(dollar));
System.out.println("Enter amount in INR to convert to Euro:");
rupee = sc.nextFloat();
euro = rupee/84;
System.out.println("Rupees : "+f.format(euro));
System.out.println("Enter amount in INR to convert to Yen:");
rupee = sc.nextFloat();
yen = 0.59*rupee;
System.out.println("Rupees : "+f.format(yen));
break;
```

case 2:

```
System.out.println("Enter number in meter to convert into kilometer:");
meter = sc.nextFloat();
kilometer = meter * 1000;
System.out.println("kilometer : "+f.format(kilometer));
System.out.println("Enter number in miles to convert into kilometer:");
miles = sc.nextFloat();
kilometer = miles * 1.60934;
System.out.println("kilometer : "+f.format(kilometer));

System.out.println("Enter number in kilometer to convert into meter:");
kilometer = sc.nextFloat();
meter = kilometer / 1000;
System.out.println("meter : "+f.format(meter));

System.out.println("Enter number in kilometer to convert into miles:");
kilometer = sc.nextFloat();
miles = kilometer / 1.60934;
System.out.println("Miles : "+f.format( miles)); break;
```

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case 3:

```
System.out.println("Enter number in hours to convert into minutes:");
hours = sc.nextFloat();
min = hours* 60;
System.out.println("Minutes : "+f.format(min));
```

```
System.out.println("Enter number in hours to convert into Seconds:");
hours = sc.nextFloat();
sec = hours * 3600;
System.out.println("Seconds : "+f.format(sec));
```

```
System.out.println("Enter number in minutes to convert into hours:");
min = sc.nextFloat();
hours = min /60;
System.out.println("Hours : "+f.format(hours));
```

```
System.out.println("Enter number in seconds to convert into hours:");
sec = sc.nextFloat();
hours = sec /3600;
System.out.println("Hours : "+f.format(hours));
break;
```

```
case 4: System.out.println("exiting the program");
```

```
System.exit(0);
```

```
}
```

```
}
```

```
}
```

```
}
```

OUTPUT:

```
Enter your choice for conversion:
1:currency converter    2:Distance converter    3:Time converter    4:exit

1
Enter amount in dollar to convert into rupee:
44
Rupees : 3300
Enter amount in Euro to convert into rupee:
23
Rupees : 1932
Enter amount in YEN to convert into rupee:
43
Rupees : 72.881
```

```
Enter amount in INR to convert to Dollar:
33
Dollar : 0.44
Enter amount in INR to convert to Euro:
32
Rupees : 0.381
Enter amount in INR to convert to Yen:
45
Rupees : 26.55
```


7. Write a java program to generate the resume. Create 2 Java classes teacher (data: personal information, qualification, experience, achievements) and student (data: personal information, result, discipline) which implements the Java interface resume with the method biodata().

```
package labPrograms;

import java.util.Scanner;

interface resume
{
    public void biodata();
}

class teacher implements resume
{
    String name;
    String emailid;
    long phone;
    String address;
    int age;
    String qualification;
    float experience;
    String achievements;

    @Override
    public void biodata() {
        // TODO Auto-generated method stub
        System.out.println("The Teacher details are:");
        System.out.println("The name :"+name);
        System.out.println("The emailid:"+emailid);
        System.out.println("phone:"+phone);
        System.out.println("address:"+address);
        System.out.println("age:"+age);
        System.out.println("qualification:"+qualification);
        System.out.println("experience:"+experience);
        System.out.println("achievements:"+achievements);
    }
}
```

```
class student_resume implements resume
{

    String name;
    String emailid;
    long phone;
    String address;
    int age;
    double result;
    String discipline;

    @Override
    public void biodata() {
        // TODO Auto-generated method stub

        System.out.println("The Student details are:");
        System.out.println("The name :"+name);
        System.out.println("The emailid:"+emailid);
        System.out.println("phone:"+phone);
        System.out.println("address:"+address);
        System.out.println("age:"+age);
        System.out.println("result:"+result);
        System.out.println("discipline:"+discipline);

    }
}

public class OOP7 {

    public static void main(String[] args) {
        // TODO Auto-generated method stub
        String n,e,a,d,g,a,c,h,d,i;
        int p,a,g;
        float re,exp;
        Scanner sc = new Scanner(System.in);
        teacher t=new teacher();
        student_resume s=new student_resume();
        System.out.println("Enter the name of the teacher:");
        t.name=sc.next();
        System.out.println("Enter the emailid of the teacher:");
        t.emailid=sc.next();
        System.out.println("Enter the phone of the teacher:");
        t.phone=sc.nextLong();
        System.out.println("Enter the address of the teacher:");
        t.address=sc.next();
        System.out.println("Enter the age of the teacher:");
        t.age=sc.nextInt();
        System.out.println("Enter the qualification of the teacher:");
        t.qualification=sc.next();
        System.out.println("Enter the experience of the teacher:");
        t.experience=sc.nextFloat();
        System.out.println("Enter the acheivements of the teacher:");
```

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```
t.acheivements=sc.next();
t.biodata();
System.out.println("Enter the name of the student:");
s.name=sc.next();
System.out.println("Enter the emailid of the student:");
s.emailid=sc.next();
System.out.println("Enter the phone of the student:");
s.phone=sc.nextLong();
System.out.println("Enter the address of the student:");
s.address=sc.next();
System.out.println("Enter the age of the student:");
s.age=sc.nextInt();
System.out.println("Enter the result of the student:");
s.result=sc.nextDouble();
System.out.println("Enter the discipline of the student:");
s.discipline=sc.next();
s.biodata();

}

}
```

OUTPUT:

```
Enter the name of the teacher:
sandhya
Enter the emailid of the teacher:
san@gmail.com
Enter the phone of the teacher:
24315
Enter the address of the teacher:
bangalore
Enter the age of the teacher:
25
Enter the qualification of the teacher:
BSC
Enter the experience of the teacher:
5
Enter the acheivements of the teacher:
no
The Teacher details are:
The name :sandhya
The emailid:san@gmail.com
phone:24315
address:bangalore
age:25
qualification:BSC
experience:5.0
acheivements:no
```

8. Write a Java program that implements a multi thread application that has three threads. First thread generates a random integer for everyone second. Second thread computes the square of the number and prints. Third thread will print the value of a cube of the number.

```
package labPrograms;

import java.util.Random;

class random_number implements Runnable
{
    public void run()
    {
        Random ra=new Random();

        for(int i=0;i<10;i++)
        {
            int r = ra.nextInt(100);
            System.out.println("Random number:"+r);
            square s=new square(r);
            s.start();
            cube c=new cube(r);
            c.start();
            try {

                Thread.sleep(1000);

            } catch (InterruptedException ex) {

                System.out.println(ex);

            }

        }

    }
}

class square extends Thread
{
    int x;
    public square(int r) {
        // TODO Auto-generated constructor stub
        x=r;
    }
    public void run()
    {
        int sq;
        sq=x*x;
        System.out.println("Square of " + x + " = " + sq);
    }
}
```

```
class cube extends Thread
{
int x;
    public cube(int r) {
        // TODO Auto-generated constructor stub
        x=r;
    }
    public void run()
    {
        int cu;
        cu=x*x*x;
        System.out.println("cube of " + x + " = " + cu);
    }
}
```

```
public class OOP8 {
public static void main(String[] args) {
// TODO Auto-generated method stub
random_number n=new random_number();
Thread t=new Thread(n);
t.start();
}
}
```

OUTPUT:

```
Random number:4
Square of 4 = 16
cube of 4 = 64
Random number:78
Square of 78 = 6084
cube of 78 = 474552
Random number:12
Square of 12 = 144
cube of 12 = 1728
Random number:84
Square of 84 = 7056
cube of 84 = 592704
Random number:73
Square of 73 = 5329
cube of 73 = 389017
Random number:11
Square of 11 = 121
cube of 11 = 1331
Random number:50
Square of 50 = 2500
cube of 50 = 125000
Random number:34
Square of 34 = 1156
cube of 34 = 39304
Random number:27
Square of 27 = 729
cube of 27 = 19683
Random number:65
Square of 65 = 4225
cube of 65 = 274625
```

**9. Write a program to perform string operations using arraylist. write a functions for the following
a.append: add at the end ,b.insert add at a particular index ,c.search d.list all strings starts with given
letter.**

```
package labPrograms;
```

```
import java.util.ArrayList;
```

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

```
public class OOP9 {
```

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

```
        // TODO Auto-generated method stub
```

```
        ArrayList<String> obj = new ArrayList<String>();
```

```
        Scanner sc = new Scanner(System.in);
```

```
        int c,ch;
```

```
        int i,j;
```

```
        String str,str1;
```

```
        do
```

```
        {
```

```
            System.out.println("STRING MANIPULATION");
```

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

```
            System.out.println(" 1. Append at end \t 2.Insert at particular index \t 3.Search \t");
```

```
            System.out.println(" 4.List string that starting with letter \t");
```

```
            System.out.println("Enter the choice ");
```

```
            c=sc.nextInt();
```

```
            switch(c)
```

```
            {
```

```
            case 1:
```

```
            {
```

```
                System.out.println("Enter the string ");
```

```
                str=sc.next();
```

```
                obj.add(str);
```

```
                break;
```

OBJECT ORIENTED PROGRAMMING WITH JAVA LABORATORY

```
}  
case 2:  
{  
System.out.println("Enter the string ");  
str=sc.next();  
System.out.println("Specify the index/position to insert");  
i=sc.nextInt();  
obj.add(i-1,str);  
System.out.println("The array list has following elements:"+obj);  
break;  
}  
case 3:  
{  
System.out.println("Enter the string to search ");  
str=sc.next();  
j=obj.indexOf(str);  
if(j!=-1)  
System.out.println("Element not found");  
else  
System.out.println("Index of:"+str+"is"+j);  
break;  
}  
case 4:  
{  
System.out.println("Enter the character to List string that starts with specified  
character");  
str=sc.next();  
for(i=0;i<(obj.size());i++)  
{  
str1=obj.get(i);  
if(str1.startsWith(str))  
{  
System.out.println(str1);  
}  
}
```

OBJECT ORIENTED PROGRAMMING WITH JAVA LABORATORY

```

    }
    break;
}

}

System.out.println("enter 0 to break and 1 to continue");
ch=sc.nextInt();
}while(ch==1);

}
}

```

OUTPUT:

```

Enter the choice
1
Enter the string
hello
enter 0 to break and 1 to continue
1
STRING MANIPULATION
*****
1. Append at end      2.Insert at particular index   3.Search
4.List string that starting with letter
Enter the choice
1
Enter the string
world
enter 0 to break and 1 to continue
1
STRING MANIPULATION
*****
1. Append at end      2.Insert at particular index   3.Search
4.List string that starting with letter
Enter the choice

```

```

1. Append at end      2.Insert at particular index   3.Search
4.List string that starting with letter
Enter the choice
1
Enter the string
world
enter 0 to break and 1 to continue
1
STRING MANIPULATION
*****
1. Append at end      2.Insert at particular index   3.Search
4.List string that starting with letter
Enter the choice
2
Enter the string
hai
Specify the index/position to insert
2
[The array list has following elements:[hello, hai, world]
enter 0 to break and 1 to continue

```

```

STRING MANIPULATION
*****
1. Append at end      2.Insert at particular index   3.Search
4.List string that starting with letter
Enter the choice
3
Enter the string to search
hello
Index of:hellois0
enter 0 to break and 1 to continue

```

```

STRING MANIPULATION
*****
1. Append at end      2.Insert at particular index   3.Search
4.List string that starting with letter
Enter the choice
4
Enter the character to List string that starts with specified character
h
hello
hai
enter 0 to break and 1 to continue

```


10. Write a Java program to read two integers a and b. compute a/b and print when b is not zero. Raise an exception when b is equal to zero.

```
package labPrograms;

import java.util.Scanner;

public class OOP_10 {

    public static void main(String[] args) {
        // TODO Auto-generated method stub
        int a,b,div;
        Scanner sc = new Scanner(System.in);
        System.out.println("Enter the value of a:");
        a=sc.nextInt();
        System.out.println("Enter the value of b:");
        b=sc.nextInt();
        try
        {
            div=a/b;
            System.out.println("the division is"+div);
        }
        catch(ArithmeticException e)
        {
            System.out.println("the division by zero "+e.getMessage());
        }
        System.out.println("this is the division operation");
    }
}
```

OUTPUT:

```
Enter the value of a:
2
Enter the value of b:
3
the division is0
this is the division operation
```

```
Enter the value of a:
3
Enter the value of b:
0
the division by zero / by zero
this is the division operation
```

11. Write a Java program that reads a file name from the user, displays information about whether the file exists, whether the file is readable, writeable, the type of file and the length of the file in bytes

```
package labPrograms;
```

```
import java.io.*;
```

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

```
class filedemo
```

```
{
```

```
    void p(String str)
```

```
    {
```

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

```
    }
```

```
    void analyze(String s)
```

```
    {
```

```
        File f=new File(s);
```

```
        if(f.exists())
```

```
        {
```

```
            p(f.getName()+" is a file");
```

```
            p(f.canRead()?" is readable":" is not readable");
```

```
            p(f.canWrite()?" is writable":" is not writable");
```

```
            p("Filesize:"+f.length()+" bytes");
```

```
            p("File last modified:"+f.lastModified());
```

```
        }
```

```
        else
```

```
            System.out.println("The file " +s+ " does not exist");
```

```
    }
```

```
}
```

```
public class OOP_11 {
```

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

```
        // TODO Auto-generated method stub
```

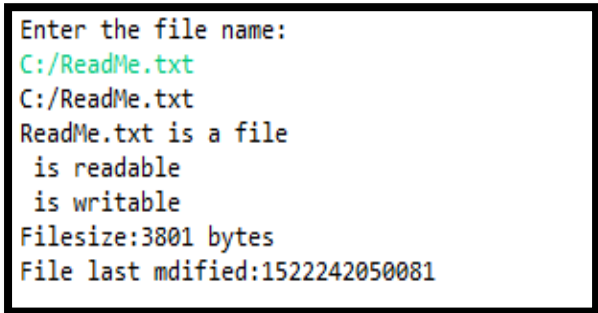
```
        filedemo fd=new filedemo();
```

```
        Scanner sc = new Scanner(System.in);
```

```
        System.out.println("Enter the file name:");
```

```
String s=sc.nextLine();  
//System.out.println(s);  
fd.analyze(s);  
}  
  
}
```

OUTPUT:



```
Enter the file name:  
C:/ReadMe.txt  
C:/ReadMe.txt  
ReadMe.txt is a file  
  is readable  
  is writable  
Filesize:3801 bytes  
File last mdified:1522242050081
```

12.a. Develop an applet that displays a simple message in centre of the screen

```
package javapgm;  
import java.awt.*;  
import java.applet.Applet;  
/* <applet code="SimpleApplet" width=300 height=50> </applet> */  
public class simpleapplet extends Applet{  
  
    public void paint(Graphics g)  
    {  
        g.drawString ("Hello world",100, 100);  
    }  
  
}
```

OUTPUT:



b. Develop a simple calculator using swings.

```
package javapgm;
import java.awt.*;
import java.awt.event.*;

public class sampleex implements ActionListener{
    int c,n;
    String s1,s2,s3,s4,s5;
    Frame f;
    Button b0, b1, b2, b3, b4, b5, b6, b7, b8, b9, badd, bsub, bmul, bdiv, beq, bclr;
    Panel p;
    TextField t1;
    GridLayout g;
    sampleex(){
        f = new Frame("Calculator");
        f.setLayout(new FlowLayout());
        p = new Panel();
        b0 = new Button("0");
        b0.addActionListener(this);

        b1 = new Button("1");
        b1.addActionListener(this);

        b2 = new Button("2");
        b2.addActionListener(this);

        b3 = new Button("3");
        b3.addActionListener(this);

        b4 = new Button("4");
        b4.addActionListener(this);

        b5 = new Button("5");
        b5.addActionListener(this);

        b6 = new Button("6");
        b6.addActionListener(this);

        b7 = new Button("7");
        b7.addActionListener(this);

        b8 = new Button("8");
        b8.addActionListener(this);

        b9 = new Button("9");
        b9.addActionListener(this);

        badd = new Button("+");
        badd.addActionListener(this);
```

```
bsub = new Button("-");
bsub.addActionListener(this);

bmul = new Button("*");
bmul.addActionListener(this);

bdiv = new Button("/");
bdiv.addActionListener(this);

beq = new Button("=");
beq.addActionListener(this);

bclr = new Button("CLR");
bclr.addActionListener(this);

t1 = new TextField(20);
f.add(t1);
g = new GridLayout(4,4);
p.setLayout(g);

p.add(b0);
p.add(b1);
p.add(b2);
p.add(b3);
p.add(b4);

p.add(b5);
p.add(b6);
p.add(b7);
p.add(b8);

p.add(b9);
p.add(badd);
p.add(bsub);
p.add(bmul);

p.add(bdiv);
p.add(beq);
p.add(bclr);

f.add(p);
f.setSize(200,180);
f.setVisible(true);
f.setBackground(Color.LIGHT_GRAY);
f.addWindowListener(new WindowAdapter() {
    @Override
    public void windowClosing(WindowEvent e) {
        System.exit(0);
    }
});
}
```

```
@Override
public void actionPerformed(ActionEvent e) {
    if(e.getSource()==b0){
        s3 = t1.getText();
        s4 = "0";
        s5 = s3 + s4;
        t1.setText(s5);
    }
    if(e.getSource()==b1){
        s3 = t1.getText();
        s4 = "1";
        s5 = s3 + s4;
        t1.setText(s5);
    }
    if(e.getSource()==b2){
        s3 = t1.getText();
        s4 = "2";
        s5 = s3 + s4;
        t1.setText(s5);
    }
    if(e.getSource()==b3){
        s3 = t1.getText();
        s4 = "3";
        s5 = s3 + s4;
        t1.setText(s5);
    }
    if(e.getSource()==b4){
        s3 = t1.getText();
        s4 = "4";
        s5 = s3 + s4;
        t1.setText(s5);
    }
    if(e.getSource()==b5){
        s3 = t1.getText();
        s4 = "5";
        s5 = s3 + s4;
        t1.setText(s5);
    }
    if(e.getSource()==b6){
        s3 = t1.getText();
        s4 = "6";
        s5 = s3 + s4;
        t1.setText(s5);
    }
    if(e.getSource()==b7){
        s3 = t1.getText();
        s4 = "7";
        s5 = s3 + s4;
        t1.setText(s5);
    }
    if(e.getSource()==b8){
        s3 = t1.getText();
        s4 = "8";
    }
}
```

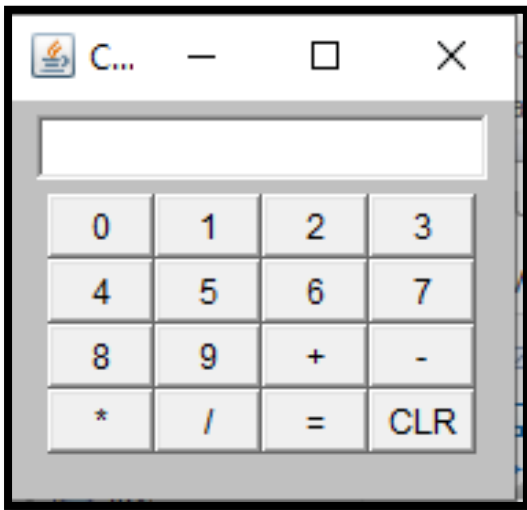
```

        s5 = s3 + s4;
        t1.setText(s5);
    }
    if(e.getSource()==b9){
        s3 = t1.getText();
        s4 = "9";
        s5 = s3 + s4;
        t1.setText(s5);
    }
    if(e.getSource()==badd){
        s1 = t1.getText();
        t1.setText("");
        c = 1;
    }
    if(e.getSource()==bsub){
        s1 = t1.getText();
        t1.setText("");
        c = 2;
    }
    if(e.getSource()==bmul){
        s1 = t1.getText();
        t1.setText("");
        c = 3;
    }
    if(e.getSource()==bdiv){
        s1 = t1.getText();
        t1.setText("");
        c = 4;
    }
    if(e.getSource()==beq){
        s2 = t1.getText();
        if(c==1){
            n = Integer.parseInt(s1) + Integer.parseInt(s2);
            t1.setText(String.valueOf(n));
        }
        if(c==2){
            n = Integer.parseInt(s1) - Integer.parseInt(s2);
            t1.setText(String.valueOf(n));
        }
        if(c==3){
            n = Integer.parseInt(s1) * Integer.parseInt(s2);
            t1.setText(String.valueOf(n));
        }
        if(c==4){
            n = Integer.parseInt(s1) / Integer.parseInt(s2);
            t1.setText(String.valueOf(n));
        }
    }
    if(e.getSource()==bclr){
        t1.setText("");
    }
}

public static void main(String[] args) {
    sampleex c = new sampleex();}

```

Output:



PART B – Practical Based Learning-Sample Programs

1. Write a Java program to print the following triangle of numbers
1
1 2
1 2 3
1 2 3 4
1 2 3 4 5
2. Write a Java program to list the factorial of the numbers 1 to 10. To calculate the factorial value, use while loop. (Hint Fact of 4 = 4*3*2*1)
3. Write a Java program to implement Inner class and demonstrate its Access protection.
4. Write a Java Program to create a window when we press
 - M or m the window displays Good Morning
 - A or a the window displays Good After Noon
 - E or e the window displays Good Evening
 - N or n the window displays Good Night
5. Write a Java program to implement a Queue using user defined Exception Handling (also make use of throw, throws). a. Complete the following: b. Create a package named shape. c. Create some classes in the package representing some common shapes like Square, Triangle, and Circle. d. Import and compile these classes in other program.
6. Write a java program to find a fibonacci series.
7. Write a java program to find the given number is palindrome or not
8. Write a java program to find the factorial of a given number.
9. Write a java program to find the reverse of a given number.
10. Write a Java program to display the season.
11. Write a Java program to check the given number is even or Odd.
12. Write a Java program to check the given number is positive or negative
13. Write a java program to find the $\sqrt{\quad}$ given number.
14. Write Java program to swap the two numbers
15. Write a java program to find the gcd of two numbers
16. Write a java program to find the largest among three numbers.

17. Write a Java program to check the given number is perfect square
18. Write a Java program to display the even number from 1 to 100
19. Write a Java program to display the odd number from 1 to 100
20. Write a java program to find the sum of natural number.
21. Write a java program to print the elements of a given array. 1
22. Write a java program to print the elements of a given array in the reverse order.
23. Write a java program to find the largest element in the given array.
24. Write a java program to find the number of elements in the given array.
25. Write a java program to find the sum of all elements in the given array.

Department Vision and Mission

Vision

To develop competent professionals with strong fundamentals in Information Science and Engineering, research and ethical values for the betterment of the society.

Mission

M1: To establish transformational learning ambience with good infrastructure facilities to impart knowledge and necessary skill set to produce competent professionals.

M2: To create new generation of engineers who excel in their career with leadership/entrepreneur qualities.

M3: To promote sustained research and innovation with emphasis on ethical values.