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JAVA Programming

Lab File

Submitted to:-

Deepakshi Mohal

Submitted By:-

Ashish

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B.Tech Cse [Sem-4]

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1) Write a programme in Java to print Hello World.

```
class Demo
{

  public static void main(String [] args)
{
  System.out.println(" Hello World");

}

}
```

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Output

Hello World

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2) Write a programme in Java to add two numbers.

```
public class Add
{
    public static void main(String[] args)
    {
        int i, j, k;

        i=10;
        j=20;
        k=i+j;

        System.out.println("sum of two value are:" + k);
    }
}
```

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Output:

Sum of two value are : 30

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3) Write a programme in Java to check wheather the number is even or odd.

```
import java.util.Scanner;
class Even_odd
{
 public static void main(String [] args)
{
   int x;
   Scanner value = new Scanner(System.in);
   x = value.nextInt();

   System.out.println("Entered value="+x);

   if(x%2 ==0)
   {
       System.out.println("Entered number is even");
   }

   else
   {
       System.out.println("Entered number is odd");
   }
}
```

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Output :-

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Entered value = 4
Entered number is even

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4) Write a programme in Java does the creation of object and classes.

```
class Object_class
{
    int x = 23;
    int y = 34;
    int z = x+y;

    public static void main(String[] args)
    {
        Object_class obj1 = new Object_class();
        Object_class obj2 = new Object_class();
        Object_class obj3 = new Object_class();

        System.out.println("Value of x =" + obj1.x);
        System.out.println("Value of y =" + obj2.y);
        System.out.println("Value of z =" + obj3.z);

    }

}
```

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Correct

value of $x = 23$
value of $y = 34$
value of $z = 57$

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5) Write a java program which show the use of arithmetic operator.

```
class Arithmatic_operator

{
    public static void main (String [] args)
    {
        int a=6;
        int b=3;

        System.out.println("Value of a="+a);
        System.out.println("Value of b="+b);
        System.out.println("Addition="+(a+b));
        System.out.println("Subtration="+(a-b));
        System.out.println("multiplication="+(a*b));
        System.out.println("divide="+(a/b));
        System.out.println("modulus="+(a%b));

    }
}
```

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Output

Value of a = 6
Value of b = 3
Addition = 9
Subtraction = 3
multiplication = 18
divide = 2
modulus = 0

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6) Write a programme show the use of relational operator.

```
import java.util.Scanner;

class Relational_operator
{
    public static void main(String [] args)
    {
        int a, b;
        Scanner x = new Scanner(System.in);

        System.out.println("Enter value of a = ");
        a = x.nextInt();
        System.out.println("Enter value of b = ");
        b = x.nextInt();

        System.out.println("a > b : " + (a > b));
        System.out.println("a < b : " + (a < b));
        System.out.println("a == b : " + (a == b));
        System.out.println("a != b : " + (a != b));
    }
}
```

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Output

Enter value of a =
5
Enter value of b =
7
a>b : false
a<b : true
a==b: false
a!=b: true.

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7) Write a java program to show the use of ternary operator

```
import java.util.Scanner;
class Ternary_operator
{
    public static void main(String[] args)
    {
        int a, b, c;

        Scanner x = new Scanner(System.in);

        System.out.println("enter value of a=");
        a = x.nextInt();
        System.out.println("enter value of b=");
        b = x.nextInt();

        c = (a<b)? a : b;

        System.out.println("smallest value =" + c);

    }

}
```

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output

```
enter value of a =
56
enter value of b =
45
smallest value = 45
```

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8) Write a java programme which show the use of logical operator.

```
import java.util.Scanner;
class Logical_Operator
{
public static void main(String[] args)
{
    int i, j, k;
    Scanner a = new Scanner(System.in);

    System.out.println("Enter value of i ");
    i = a.nextInt();
    System.out.println("Enter value of j");
    j = a.nextInt();
    System.out.println("Enter value of k");
    k = a.nextInt();

    if(i>j && i>k)
    System.out.println(i+" is greater than "+j+", "+k);
    else if (j>i && j>k)
    System.out.println(j+" is greater than "+i+", "+k);
    else
    System.out.println(k+" is greater than "+i+", "+j);
    }
}
```

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Output -

```
Enter value of i
56
Enter value of j
67
Enter value of k
54
67 is greater than 56, 54
```

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9 Write a program to show the use of break statement.

```
class Break_statement
{
    public static void main (String [] args)
    {
        int i;
        for (i=0; i<15; i++)
        {
            System.out.println(i);
            if (i==7)
            {
                break;
            }
        }
    }
}
```

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Output

0

+ 9 5 4 3 2 1 - 0

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10 Write a programme to show the use of continue statement.

```
class Continue-statement
{
    public static void main (String [] args)
    {
        int i=0;
        while (i<10)
        {
            if (i==5)
            {
                i++;
                continue;
            }
            else
            {
                System.out.println (i);
                i++;
            }
        }
    }
```

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Output

0
1
2
3
4
6
7
8
9

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11 Write a program of multiplication in Java using for Loop.

```
class Multiplication
{
    public static void main(String [] args)
    {
        int i, j;
        for(i=1; i<=10; i++)
        {
            j = 2*i;
            System.out.println("2 * "+i+" = "+j);
        }
    }
}
```

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Output :-

2 * 1 = 2
2 * 2 = 4
2 * 3 = 6
2 * 4 = 8
2 * 5 = 10
2 * 6 = 12
2 * 7 = 14
2 * 8 = 16
2 * 9 = 19
2 * 10 = 20

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12. Write a program to illustrate the use of classes and Objects.

```
class Rectangle
{
    double length;
    double width;
    void Getdata(double l, double w){
        length = l;
        width = w;
    }

    void Areaeact(){
        double area = length x width;
        System.out.println(area);
    }
}

class Rectangle_class{
    public static void main(String[] args)
    {
        Rectangle r1;
        r1 = new Rectangle();
        r1.length = 25.12;
        r1.width = 12.5;
        System.out.println("area of reclangle of r1=" +(r1.length
                                                    x r1.width));
```

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```
Rectangle r2 = new Rectangle ();
r2. Setdata (12, 10);
System. out. println(" area of rectangle of r2 = ");
r2. Areareact();
}
}
```

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Output :

area of rectangle of r1 is = 314.0
area of rectangle of r2 =
120.0

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13. Write a program in Java to overload the function with different arguments.

```
class Box
{
    double length;
    double width;
    double height;

    Box(double l, double w)
    {
        length = l;
        width = w;
    }

    Box(double l, double w, double h)
    {
        length = l;
        width = w;
        height = h;
    }

    double Box_area()
    {
        double area = length x width;
        return area;
    }
```

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```
double Box_volume()
{
    double volume = length x width x height;
    return volume;
}
}

class Overload {
    public static void main(String[] args)
    {
        Box b1 = new Box(25, 20, 20.75);
        double a = b1.Box_area();
        System.out.println(" the area of box b1 =" + a);

        Box b2 = new Box(12.5, 10.75, 5.5);
        double v = b2.Box_volume();
        System.out.println(" the volume of b2 =" + v);

    }
}
```

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Output:-

The area of box b1 = 522.9
the volume of box b2 = 739.0625

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14 write a program in Java to show the use of method overloading by changing the data type of argument.

```
class Overload{
  void types(int a){
  System.Out.println("you have entered integer value");
  }

  void typer(double a){
  System.out.println("you have entered floating value");
  }
}

class Datatype_overload
{
  public static void main(String[] args)
  {
    Overload ov = new Overload();
    ov.types(3.6);
  }
}
```

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Output :-

you have entered the floating value.

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15) Write a program to show the use of garbage collector by nulling the reference.

```
class Finalize {
  public static void main(String[] args)
  {
    Finalize fp1 = new Finalize();
    Finalize fp2 = new Finalize();
     fp1 = null;
     fp2 = null;
     System.gc();
  }
  @Override
   protected void finalize ()
   {
     System.out.println("Finalize is done");
   }
}
```

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Output:

finalize is done
finalize is done

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(16) Write a program to show the use of grabage collector assiging a reference to another.

```
class Main{
    int a, b;
    public void setdata(int c, int d);
    {
        a = c;
        b = d;
    }

public void show_data (){
System. out. println (" Value of a=" + a);
System. out. println (" Value of b=" + b);
}

public static void main (String args[])
{
    Main obj1 = new Main();
    Main obj2 = new Main();
        obj1. set data (1, 2);
        obj2. setdata (3, 4);
        obj1. show-data ();
        obj2. show_datata ();
    }
}
```

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Output :-

Value of a = 1
Value of b = 2
Value of a = 3
Value of b = 4

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17) W.A.P in Java to show the use of finalize method.

```
class Test_finalize {
public static void main (String [ ] args) {
    Test_finalize obj1 = new Test_finalize();
    Test_finalize obj2 = new Test_finalize();
        // obj1 = null;
        obj1 = null;
        obj2 = null;
System.gc();
System.out.println("End of garbage collector");
}

protected void finalize ()
{
System.out.println("Finalize method called");
}
}
```

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Output :-

Finalize method called
Finalize method called
End of garbage collector.

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18) Write a programme of single inheritance.

```
class Rectangle {
double length, width;
Rectangle () {
length = width = 0.0;
}
Rectangle (double l, double w)
{
    length = l;
    width = w;      }
void Display_area()
{
 System.out.println("\n the area of rectangle =" + (length
                                                  × width));
}  }

class Cuboid extends Rectangle
{
    double height;
    Cuboid()
  {   super();
        height = 0.0;  }

void display_volume () {
System.out.println("\n volum of cuboid =" + (length × Width
                                                  × height));
}
```

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```
Cuboid (double l, double w, double h)
{
    super (l, w);
    height = h;
} }

class Single_Inheitance
{
    public static void main(String[] args)
    {
        Cuboid c = new Cuboid (4.5, 5.5, 7.2);
        c. Display_area ();
        c. display_volume();
    }
}
```

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Output:-

The area of rectangle = 24.75

Volume of cuboid = 178.20000000000002

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19 W.A.P to show the use of Multilevel inheritance

```
class Class1 {
int x
Class1()
{ x = 0;
System.out.println("Constructor of class1 without argument
                    is invoked"); }

Class1 (int X) {
  x = X;
System.out.println("Constructor of class1 with argument
                    is invoked"); }

void Display_x()
{
  System.out.println("\nX="+x);
} }

class Class2 extends class1 {
int y;
  Class2() {
  super();
  y = 0;
System.out.println("Constructor of class 2 without
                    argument is invoked");
}
```

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```
Class2 (int X, int Y) {
    super(X);
    y = Y;
System.out.println("Constructor of class2 with argument is
                    invoked"); }

void Display_y() {
  {
    System.out.println("\n y =" + y);
  } }

class Class3 extends Class2
{
  int z;
  Class3() {
  ~~super(X, Y, Z~~ super();
                z = 0;
System.out.println("Constructor of class3 without any
                    argument is invoked"); }

Class3(int X, int Y, int Z) {
super(X, Y);
z = Z;
System.out.println("Constructor of class3 with argument
                    is invoked"); }
void Display_z() {
System.out.println("\n z =" + z); } }
```

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```
class Multilevel_inheritance
{
    public static void main (String [] args)
    {
        Class3 c1 = new Class3();
        c1. Display_x();
        c1. Display_y();
        c1. Display_z();

        Class3 c2 = new Class3(2,3,4);
        c2. Display_x();
        c2. Display_y();
        c2. Display_z();
    }
}
```

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Output:-

Constructor of class1 without argument is invoked
Constructor of class2 without argument is invoked.
Constructor of class3 without any argument is invoked.

x = 0
y = 0
z = 0

Constructor of class1 with argument is invoked
Constructor of class2 with argument is invoked
Constructor of class3 with argument is invoked

x = 2
y = 3
z = 4

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```
class Student
{
    String f_name = new String();
    String l_name = new String();
    int age, roll;
    Student(String f_name, String l_name, int age, int roll)
    {
        this.f_name = f_name;
        this.l_name = l_name;
        this.age = age;
        this.roll = roll;
    }

    void display_data()
    {
        System.out.println("\n First name =" + f_name);
        System.out.println("\n last name =" + l_name);
        System.out.println("\n age =" + age);
        System.out.println("\n roll number =" + roll);
    } }

class Science extends Student
{
    String ssub1 = new String();
    String ssub2 = new String();
    String ssub3 = new String();
}
```

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```
Science(String f_name, String l_name, int age, int roll,
        String ssub1, String ssub2, String ssub3)
{
  super(f_name, l_name, age, roll);
  this.ssub1 = ssub1;
  this.ssub2 = ssub2;
  this.ssub3 = ssub3;
}

void display_data()
{
  System.out.println("\n information of science Student");
System.out.println("\n first name =" + f_name);
System.out.println("\n last name =" + l_name);
System.out.println("\n age =" + age);
System.out.println("\n roll number =" + roll);
System.out.println("\n 1st subject of science =" + ssub1);
System.out.println("\n 2nd subject of science =" + ssub2);
System.out.println("\n 3rd subject of science =" + ssub3);
} }

Class Arts extends Student
{
  String asub1 = new String();
  String asub2 = new String();
  String asub3 = new String();
```

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```
Arts(String f_name, String l_name, int age, int roll, String
    asub1, String asub2, String asub3) {

  super(f_name, l_name, age, roll);
  this.asub1 = asub1;
  this.asub2 = asub2;
  this.asub3 = asub3;
  }

void display_data ()
{
  System.out.println("information of arts students");
  Super.display_data();
  System.out.println("\n 1st subject of arts="+ asub1);
  System.out.println("\n 2nd subject of arts ="+ asub2);
  System.out.println("\n 3rd subject of arts="+ asub3);
  } }

Class Hierarichar_inheritance{
  public static void main (String [] args):
  {
Science sc=new Science("Aashish","Kumar",20, 91,"chemistry",
                "Math", "Physics");
Arts ar = new Arts("Kunaal", "Kumar", 21, 84, "History",
                "economics", "English");
sc.display_data();
ar.display_data();  } }
```

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Output:-

information of science student

First name = Aashish
last name = Kumar
age = 20
roll number = 91
1st subject of science = chemistry
2nd subject of science = Math
3rd subject of science = Physics.

Information of arts student
First name = Kunal
last name = Kumar
age = 21
roll number = 84
1st subject of arts = History
2nd subject of arts = economics
3rd subject of arts = English.

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21 Write a program show the use of dynamic dispatc

```
Class A
{
  void callme( )
  {
    System.out.println("Inside a class A");
  }}

Class B extends A
{
  void callme() {
  System.out.println("Inside a class B");
  }}

class C extends A
{
  void callme()
  {
    System.out.println("Inside a class C");
  }}

class Dispatch
{
  public static void main(String[] args)
  {  A a = new A();
     B b = new B();
```

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```
C c = new C();
A r;
r = a;
r.callme();
r = b;
r.callme();
r = c;
r.callme();
}}
```

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Output

```
Inside a class A
Inside a class B
Inside a class C
```

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22. WAP of method overriding in Java

```
class Person
{
    private String name;
    private int age;
    private String address;
    public Person()
    {
        name = new String();
        age = 0;
        address = new String();
    }
    public Person(String nam, int ag, String addr)
    {
    name = nam;
    age = ag;
    address = addr; }

    public void display()
    {   System.out.println("\n name =" + name);
        System.out.println("\n age =" + age);
        System.out.println("\ address =" + address);
    } }

class Employe extends Person {
    private String designation;
```

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```
private int empcode;
private float salary;

public Employee()
{
    super();
    empcode = 0;
    designation = new String();
    salary = 0.0f; }

public Employee(String nam, int ag, String addr,
                int Empcd, String desg, float sal)
{
    super(nam, ag, addr);
    empcode = Empcd;
    designation = desg;
    salary = sal;
}

public void display()
{
    super.display();
    System.out.println("\n employee code =" + empcode);
    System.out.println("\n designation =" + designation);
    System.out.println("\n salary =" + salary);
}
}
```

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```
class Method_overriding
{
    public static void main(String[] args)
    {
        Person p = new Person("Aashish", 20, "Hoshiarpur");
        p.display();

        Employee e = new Employee("Sankalp", 25, "Hoshiarpur", 2345,
                                  "Programmer", 50000);
        e.display();
    }
}
```

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Output

name = Aashish
age = 20
address = Hoshiarpur
name = Pankaj
age = 25
address = Hoshiarpur
employe code = 2345
disgaination = Programmer
Salary = 50000.0

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23. Write a program of abstract class in Java.

```
abstract class Info
{
    abstract void display();
}

class biodata extends Info
{
    private String name;
    private long num;
    private int age;
    private String gen;
    private String ifsc;

    public biodata(String nam, int ag, String gen,
                   long no, String ifs)
    {
        name = nam;
        age = ag;
        gen = ge;
        num = no;
        ifsc = ifs;
    }

    public void display()
    {
        System.out.println("name =" + name);
```

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```
System.out.println("age="+age);
System.out.println("gender="+gen);
System.out.println("account number="+num);
System.out.println("ifsc code="+ifsc);
}}

class Abstract
{
    public static void main(String [] args)
    {
        Info i;
        biodata bio= new biodata("unknown",20,"male",
                                 1234567890,"qrfg834");
        i=bio;
        i.display();
    }}
```

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Output:

name: unknown.
age = 20
gender = male
account number = 1234567890
ifsc code = grfq 834

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24 W.A to ~~of~~ final keyboard with function.

```
class one
{
private int x, y;
public one()
{   x=5;
    y=10;   }

final public void display()
{
  System.out.println("\n x="+x+"\n y="+y);
}}

class two extends one
{
  private int z;
  public two();
{   super();
    z=0;
}
  final public void display()
{
    super.display();
    System.out.println("\n z="+z);
}
}
```

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```
class Final
{
  public static void main (String[] args)
  {
      one o = new one();
        o.display();

      two t = new two();
        t.display();
  }
}
```

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Output:

```
final.java:29: error: display() in two cannot
                      override display() in one
    final public void display()
                     ^
    overridden method is final

1 error
```

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25 W.A.P of final keyboard with class

```
final class one
{
    private int x, y;
    public one()
    {
        x=5;
        y=10; }

    public void display()
    {
        System.out.println("\n x="+x + "\n y="+y);
    }
}

class two extends one
{
    private int z;
    public two()
    {
        super();
        z=0; }

    public void display()
    {
        super.display();
        System.out.println("\n z="+z); } }
```

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```
class final_class
{
    public static void main(String[] args)
    {
        one o = new one();
        o.display();

        two t = new two();
        t.display();
    }
}
```

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final_class.java:21 error: cannot inherit from final one class two
extends one

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26 Write a program to create user define package.

```
package biodata;
import java.util.Scanner;
public class Packages
{
    String name = new String();
    int age;

    Scanner nam = new Scanner(System.in);
    Scanner age = new Scanner(System.in);

public void getdata()
{
    System.out.println("Enter name =");
    name = nam.next();

    System.out.println("Enter age =");
    age = ag.nextInt();
}

public void display()
{
    System.out.println("\n info of the Student");
    System.out.println("name =" + name);
    System.out.println("aage" = + age);
}
```

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```
    public static void main(String [] args)
{
    Packages pkg = new Packages();
      pkg.getdata();
      pkg.display();
  }
}
```

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Output:

```
Enter name = Aashish
Enter age = 20

infor of the student
name = Aashish
age = 20
```

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27 Write a program to import user define package.

import liodata.Packages;

```
class Import
{
    public static Void main(Strint[] args)
    {
        Packages pkg = new Packages();
        pkg.getdata();
        pkg.display();
    }
}
```

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Output

```
Enter name : XYZ
Enter age : 12

info of the Student
name = XYZ
age = 12
```

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28 Write a program to import built in package.

```
import java.util.Scanner;
class Import2
{
  public static void main(String[] args)
  {
    String name = new String();
    Scanner nam = new Scanner(System.in);

System.out.println("Enter name = ");
name = nam.next();

System.out.println("\n Entered name=" + name);
}
```

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Output

Enter name = Ajay

Entered name = Ajay

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Expt. No.---------- Page No.---------

29 Write a program of multiple inheritance in interface.

```
interface constant
{
    final static double x=10;
    final static double y=20;
    final static double z=30;
}

interface method
{
    double addition();
    double sub();
    double mult();
}

class maths implements constant, method
{
    public double addition()
    {
        return x+y+z;
    }

    public double sub()
    {
        return x-y-z;
    }
```

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```
public double mult()
{
    return x*y*z;
}
}

class Interface
{
 public static void main(String[] args)
 {
    maths m = new maths();
    System.out.println("Addition="+m.addition());
    System.out.println("Subtraction="+m.sub());
    System.out.println("multiplication="+m.mult());
 }
}
```

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Output

Addition = 60.0
Subtraction = -40.0
multiplication = 6000.0

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30 Write a program in java to show the use of string handling.

```
public class String_function
{
public Static Void main(String[] args)
{
String s1 = new String("James");
String s2 = new String("Goblin);

System.out.println("String1=" + s1);
System.out.println("String2=" + s2);

String s3 = s1.toUpperCase();
System.out.println("String1 to upper case =" + s3);

String s4 = s1.toLowerCase();
System.out.println("String 1 to lower case=" + s4);

String s5 = s1.replace("J", "G");
System.out.println("After replacing J with G" = + s5);

boolean b1 = s1.equals(s3);
System.out.println("to check S1 and S3 equal or not=" + b1);

boolean b2 = s1.equalsIgnoreCase(S3);
System.out.println("to check S1 and S3 equal or not
                by ignoring case=" + b2);
```

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```
char c = S2.charAt(4);
System.out.println("The character a 4th position of
                    S2 = " + c);

String S6 = S1.concat(S2);
System.out.println("concat the S1 and S2 = " + S6);

String S7 = S2.substring(4);
System.out.println("Substring of S2 after 4th position = " + S7);

int S8 = S2.length();
System.out.println("total length of string S2 = " + S8);

}

}
```

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output

String 1 = James
String 2 = Goblin
String 1 to upper case = JAMES
String 1 to lower case = james
After replacing J within = Games
to check S1 and S3 equal or not = false
to check S1 and S3 equal or not by ignoring case = true
The character at 4rt position of S2 = i
Concat the S1 and S2 = JamesGoblin
Substring of S2 after 4rth position = in
total length of string S2 = 6

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31) Write a program of hybrid inheritance using interface.

```
interface marks
{
    double math = 15;
    double com = 17;
    double eng = 18;
    double pun = 10;
    double hin = 14;
}

interface total extends marks
{
    double total_mark();
}

interface perc extends mark
{
    double percentage();
}

class student implements total, perc
{
    public double total_mark()
    {
        return math + com + eng + pun + hin;
    }
```

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```
public double percentage()
{
 return (math + com + eng + kum + hin)/100 x 100;
}
}

public class Hybrid
{
 public static void main(String[] args)
 {
     student st = new student();
System.out.println("Total mark obtained =" + st.total_mark());
System.out.println("percentage =" + st.percentage() + "%");
 }
}
```

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Output :

Total marks obtained = 74.0
percentage = 74.00/0

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Aim: Write a programme exception.

```
public class exception
{
    public static void main(String[] args)
    {
        int i = 10;
        int j = 2;
        int k = i/(j-j);
        System.out.println("k=" + k);
        int l = i/(j+j);
        System.out.println("l=" + l);
    }
}
```

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Output:

```
Exception in thread "main" java.lang.ArithmeticException:
/ by zero
    at exception.main(exception.java:7)
```

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Que 33 Program of exception handling in Java using try and catch

```
class Try
{
public static void main(String[] args)
{
String name="Elon musk";
try
{ char c = name.charAt(6);
 System.out.println("Character at 6th position"+c);
  char c = name.charAt(12);
}

catch(StringIndexOutOfBoundsException obj)
{
System.out.println("Index value 12 is not exist");
}
}
}
```

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Output:-

Charater at 6th position = u
Index value 12 is not exist

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Q.3:- W.A.P of multiple Catch Statement.

```
public class multiple_Catch
{
  public static void main(String[] args)
  {
    int num[] = {56,23,13,45,35,24,244,78};
    try
    {
      System.out.println("number at 1st position:" + num[0]);
      System.out.println("number at 10 position:" + num[10]);
    }

    catch(ArithmeticException art)
    {  System.out.println("this is arithmatic Exception");
    }

    catch(ArrayIndexOutOfBoundsException arr)
    {
      System.out.println("array index value is out of rang");
    }

    catch(StringIndexOutofBoundException st)
    {
      System.out.println("String Index value is out of range");
    }
  }
}
```

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Output

number at 1st position = 56
array index value is out of limit

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Q.3 W.A.P Show the use of finally block

```
public class Finally
{
public static void main(String [] args)
{
int num[] = {56, 23, 13, 45, 35, 24, 244, 78};
try
{
System.out.println("Number at 1st position=" + num[0]);
System.out.println("Number at 10th position=" num[9]);
}

catch(ArithmeticException ari)
{
System.out.println("This is arithmetic exception");
}

finally
{
System.out.println("Programe is Completed");
}
}
}
```

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Output:

Number at 1st position = 56
programme is Completed
Exception in thread "main" java.lang.ArrayIndexOutOfBoundsException: Index 10 out of bounds for length 8 at Finally.main(Finally.java:9)

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Que:30 W.A.P of throw statement.

```
public class Throw
{
    public static void main (String[] args)
    {
        String s1 = "throw statement";
        try
        {
            System.out.println("Value at 7th position:" + s1.charAt(6));
            throw new StringIndexOutOfBoundException();
        }

        catch(StringIndexOutOfBoundException st)
        {
            System.out.println("String Index 14 is out of range");
        }
    }
}
```

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Output:

Value at 7th position = S

String index 14 is out of range.

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Ques: 3) W.A.P Show the use of throws Statement.

```
public class Throws
{
    void error() throws StringIndexOutOfBoundsException
{
  System.out.println("Inside the Throws class");
  throw new StringIndexOutOfBoundsException();
}

  public static void main(String[] args)
{
    Throws te = new Throws();
    Try
    {
      te.error();
    }
    catch(StringIndexOutOfBoundsException st)
    {
    System.out.println("String Index out of range");
    }
  }
}
```

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Output:

Inside the throws class
String index is out of order

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Q-38 W.A.P to create thread with extend to Thread class.

```
import java.lang.Thread;
class Demo extends Thread
{
  public void run()
  {
    System.out.println("Thread is running");
  } }

public class Thread_class
{
  public static void main(String[] args)
  {
    Demo d = new Demo();
    d.start();
  }
}
```

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Output

Thread is running.

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37 W.A.P to create a thread implement runnable interface.

```
import java.lang.Runnable;

class Demo implement Runnable
{
    public void run()
    {
        System.out.println("thread is running");
    }
}

public class Thread_interface
{
    public static void main(String[] args)
    {
        Demo d = new Demo();
        Thread t = new Thread(d);
        t.start();
    }
}
```

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Output

thread is running

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40: W.A.P of thread with using thread Method.

```
class thread1 extends Thread
{
  public void run()
  {
    String j = Thread.currentThread().getName();
    System.out.println("thread" + j + " is running");

for (int i = 0; i<3; i++)
{
  System.out.println("thread" + j + " = " + i);
}
try
{
  Thread.sleep(300);
}
catch (InterruptedException ie)
{
  System.out.println("thread" + j + " is running");
}
}

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

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```
{
    Thread1 th1 = new Thread1();
    Tread t1 = new Thread(th1, "1");

    thread1 th2 = new thread1();
    Thread t2 = new Thread(th2, "2");

    t1.start();
    t2.start();
  }
}
```

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thread 1 is running
thread 2 is running
thread 2 = 0
thread 2 = 1
thread 2 = 2
thread 1 = 0
thread 1 = 1
thread 1 = 2

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41 Write a program to add priorities in thread.

```
class A extends Thread
{
  public void run()
  {
    String nam = Thread.currentThread().getName();
    System.out.println("The thread" + nam + " has priority"
                        + Thread.currentThread.getPriority());
  }
}

class B extends Thread
{
  public void run()
  {
    String nam = Thread.CurrentThread.getName();
    System.out.println("The thread" + nam + " has priority" +
                        Thread.CurrentThread.getPriority());
  }
}

public class priorities_thread
{
  public static void main(String[] args)
  {
    A a = new A();
    B b = new B();
```

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```
Thread t1 = new Thread(a, "Thread A");
Thread t2 = new Thread(b, "Thread B");

t2.setPriority();
t1.setPriority(Thread.MIN_PRIORITY);
.
t1.start();
t2.start();
```

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The thread A has priority 1
The thread B has priority 6

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42 W.A.P of inter thread communication

```
class Customer
{
    int amount=1000;
    synchronized void withdraw(int amount)
{
    System.out.println("going to withdraw...");
    if(this.amount < amount)
{
    System.out.println("less ballance, waiting for deposit...");
    try
{
      wait()
    }
    catch(Exception e)
    { }
    }

    this.amount -= amount;
    System.out.println("Withdraw completed...");
}

    synchronized void deposit(int amount)
{
    System.out.println("going to deposit...");
    this.amount += amount;
```

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```
System.out.println("deposit completed...");
notify();
}
}

public class inter_process_Communication
{
public static void main(String[] args)
{
final Customer c = new Customer();
new Thread()
{
public void run()
{
c.withdraw(1500);
}.start();

new Thread()
{
public void run()
{
c.deposit(10000);
}.start();
}
}
```

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Output

going to withdraw...
less balance, waiting for deposit...
going to deposit...
deposit completed...
withdraw completed...

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43) W.A.P of synchronized thread in Java.

```
class count
{
  synchronized void print_counting(int n)
  {
    for(int i=0; i<5; i++)
    {
      System.out.println(n+"x"+i+"="+(n*i));
    }
  }

class threadA extends Thread
{
  count c;
  threadA(count c)
  {
    this.c = c;
  }

  public void run()
  {
    String nam = Thread.currentThread().getName();
    System.out.println("The Thread =" + nam);
    c.printing_counting(5);
  }
}
```

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```
class ThreadB extends Thread
{
    count c;
    ThreadB( Count c);
    {
        this.c = c;
    }
    public void run()
    {
        String nam = Thread.currentThread.getName();
        System.out.println("The thread =" +nam);
        c.print_Counting(6);
    }
}

public class Synchronization
{
    public static void main(String[] args)
    {
        count c = new Count();
        thread a = new ThreadA(c);
        ThreadB b = new ThreadB(c);
        Thread t1 = new Thread(a, "Thread A");
        Thread t2 = new Thread(b, "Thread B");
        t1.start();
        t2.start();
    }
}
```

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Output

The thread = Thread A
The thread = Thread B

5 X 0 = 0
5 X 1 = 5
5 X 2 = 10
5 X 3 = 15
5 X 4 = 20
6 X 0 = 0
6 X 1 = 6
6 X 2 = 12
6 X 3 = 18
6 X 4 = 24

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44 W.A.P of thread using sleep and resume method.

```
class thr1 extends Thread
{
    public void run()
    {
        String nam = Thread.currentThread().getName();
        System.out.println("name of the thread = "+nam);
        for(int i = 0; i<5; i++)
        {
            try
            {
                sleep(100);
            }
            catch(Exception e)
            {
                System.out.println("interrup is occured");
            }
            System.out.println(i);
        }
    }
}

class thr2 extends Thread
{
    public void run()
    {
```

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```
String nam = Thread.currentThread().getName();
System.Out.println("name of thread =" + nam);
for(int i=0; i<5; i++)
{
  try
  {
    sleep(100);
  }
  catch(Exception e)
  {
    System.out.println("interrupt occured");
  }
  System.out.println(i);
}
}

public class suspend_resume
{
  public static void main(String[] args)
  {
    thr1 t1 = new thr1();
    thr2 t2 = new thr2();
    Thread T1 = new Thread(t1, "A");
    Thread T2 = new Thread(t2, "B");
    t1.Start();
    t1.suspend();
    t2.Start();
    t1.resume();
  }
}
```

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name of thread = B
name of thread = A
0
0
1
1
2
2
3
3
4
4

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45 W.P.P of applet.

```
import java.awt.*;
import java.applet.*;

/* using the applet tag */

/*
<applet code= appdemo height =200 width=200>
</applet>
*/

public class appdemo extends Applet
{
String s="This is applet demo";
public void init()
{ font f = new font("Arial", Font.BOLD, 14);
setFont(f);
}

public void paint(Graphics g)
{
g.drawString(s, 20, 20);
g.drawRect(50, 50, 100, 100);
g.setColor(Color.blue);
g.fillRect(50, 50, 100, 100);
}}
```

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Applet Viewer: appdemo

Applet

This is applet demo

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46 W.A.P of awt. ffa frame

```
import java.awt.*;

public class awt_frame extends Frame
{
    public static void main(String[] args)
    {
        awt_frame f = new awt_frame();
        f.setSize(300,400);
        f.setVisible(true);
    }
}
```

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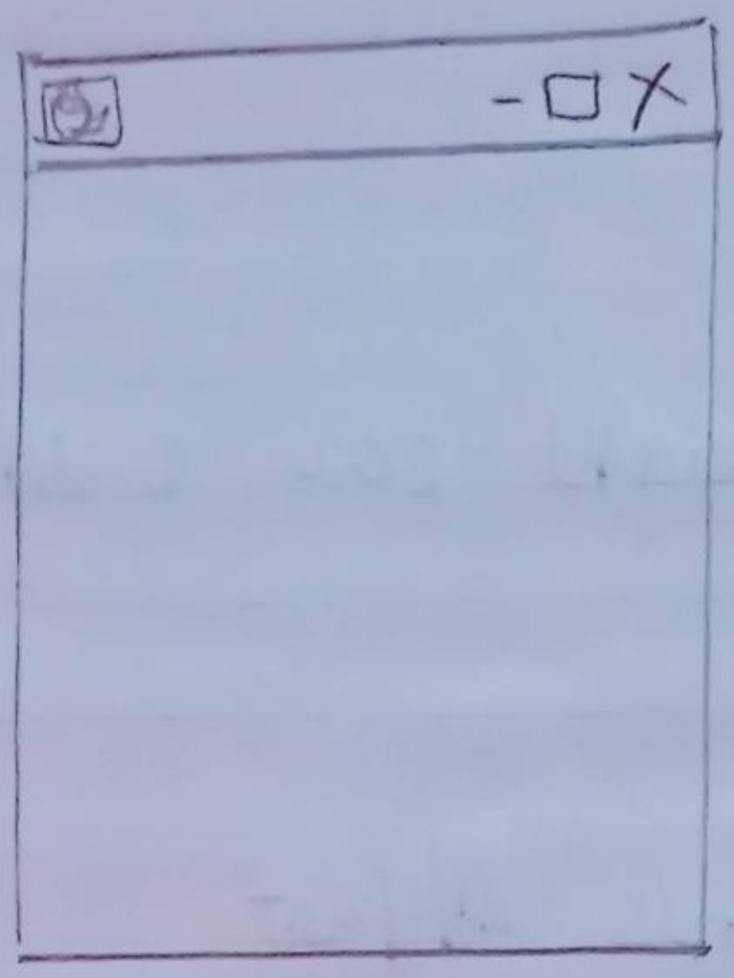

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47 WAP of awt frame with title

```
import java.awt.*;

public class awt_frametitle extends Frame
{
public Static Void main(String[] args)
{
    awt_frametitle f = new awt_frametitle();
    f.setTitle("demo of the frame");
    f.setSize(300, 400);
    f.setVisible(true);
}
}
```

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demo of the frame

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8 WAP of creating a button.

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

class awt_button extends Frame
{
    Button b1;
    awt_button()
    {
     this.setLayout(null);
     b1 = new Button("Save");
     b1.setBounds(100, 100, 100, 100);
     this.add(b1);

     addWindowListener(new WindowAdapter()
     {
       public void windowClosing(WindowEvent e)
       {
        System.exit(0);
       }
     });
    }

    public static void main(String[] args)
    {
      awt_button c = new awt_button();
```

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```
c.setTitle("adding button");
c.setVisible(true);
c.setSize(400,400);
}
}
```

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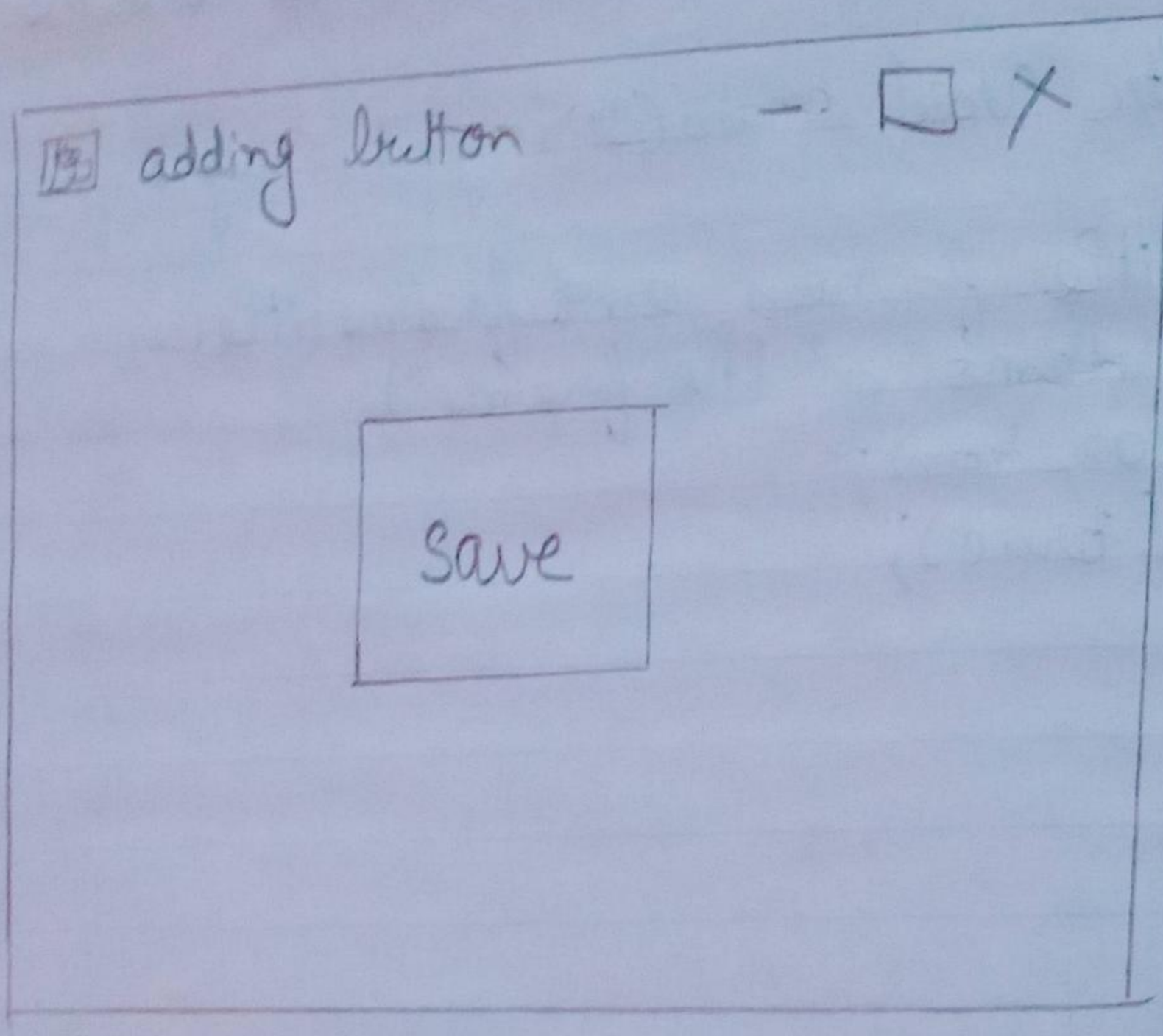
adding button



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Q.9. Write a program to creating a label with text field.

```
import java.awt.*;

public class label_textfield extends Frame
{
  Label l1, l2;
  TextField t1, t2;
  Button bt;
  ~~form~~
  label_textfield()
  {
    l1 = new Label("username");
    l2 = new Label("password");

    bt = new Button("login");

    t1 = new TextField();
    t2 = new TextField();

    bt.setBounds(200, 200, 40, 20);
    t1.setBounds(170, 90, 200, 20);
    t2.setBounds(170, 140, 200, 20);

    l1.setBounds(100, 90, 70, 20);
    l2.setBounds(100, 140, 70, 20);
```

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```
        this.add(l1);
        this.add(l2);
        this.add(t1);
        this.add(t2);
        this.add(bt);
    }

    public static void main(String[] args)
    {
        // form f = new
        label_textfield f=new label_textfield();
        f.setTitle("Login page");
        f.setlayout(null);
        f.setVisible(true);
        f.setBounds(100,100,600,600);
```

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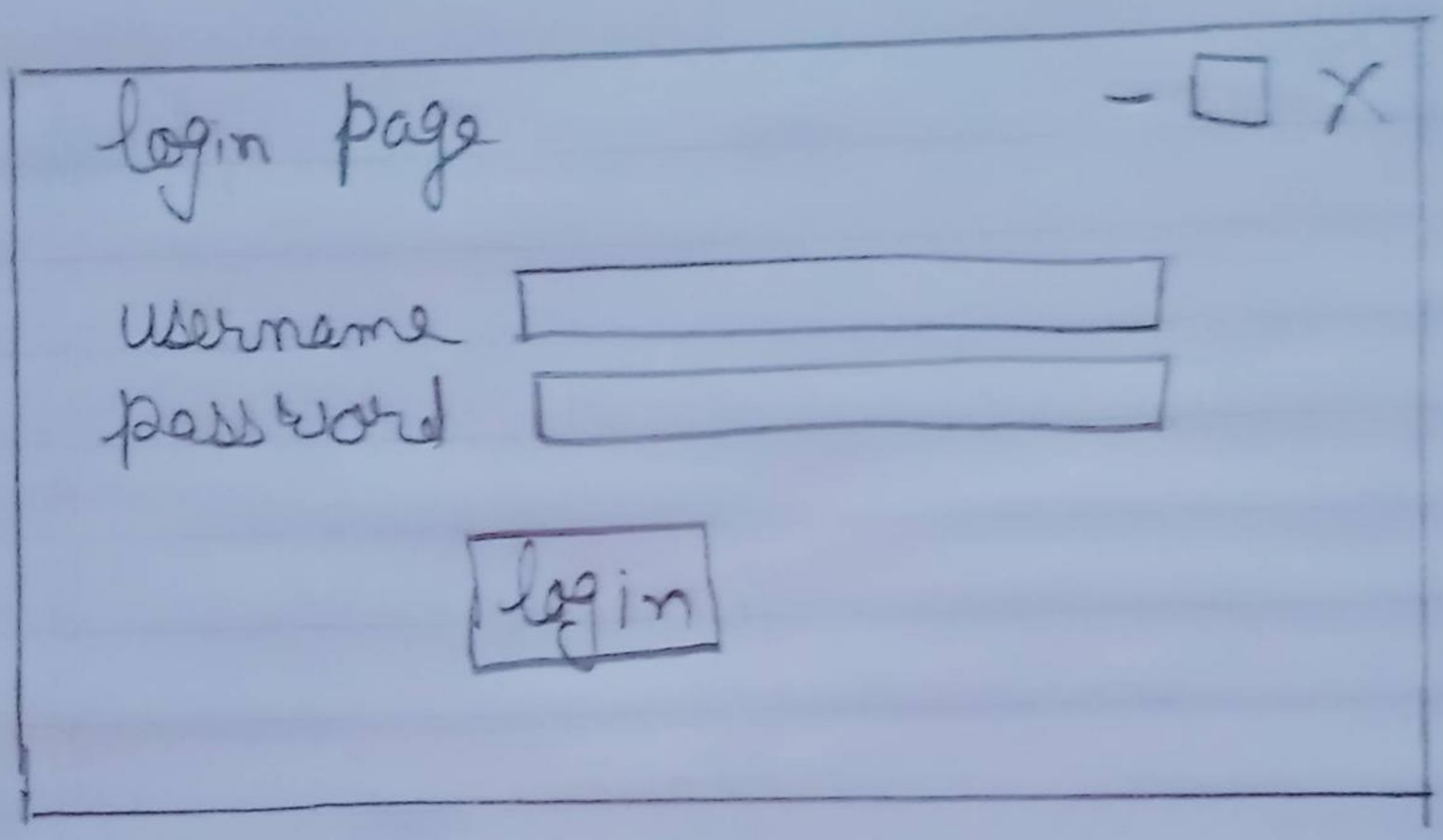

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Expt. No.---------- Page No.---------

Sol) W.A.P to adding check box

```
import java.awt.*;

public class checkbox extends Frame
{
  checkbox()
  {
   Checkbox ch1 = new Checkbox("java");
   ch1.setBounds(100, 100, 50, 50);

   Checkbox ch2 = new Checkbox("c++");
   ch2.setBounds(100, 200, 50, 50);

   this.add(ch1)
   this.add(ch2);
  }

  public static void main(String[] args)
  {
    checkbox che = new checkbox();
    che.setTitle("check box");
    che.setLayout(null);
    che.setVisible(true);
    che.setBounds(100, 100, 300, 400);
  }
}
```

Date ---------- Teacher's Signature ----------

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check box

- ☐ ✕

☑ Java

☑ C++

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W.AP to add scrollbar

```
import Java.awt.*;

public class scrollbar extends Frame
{ scrollbar()
  Scrollbar s = new Scrollbar();
  s.setBounds(100,100,50,100);
  this.add(s);
}

public static void main(String[] args)
{
  scrollbar sc = new scrollbar();
  sc.setLayout(null);
  sc.setVisible(true);
  sc.setBounds(100,100,400,300);
```

Date

Teacher's Signature

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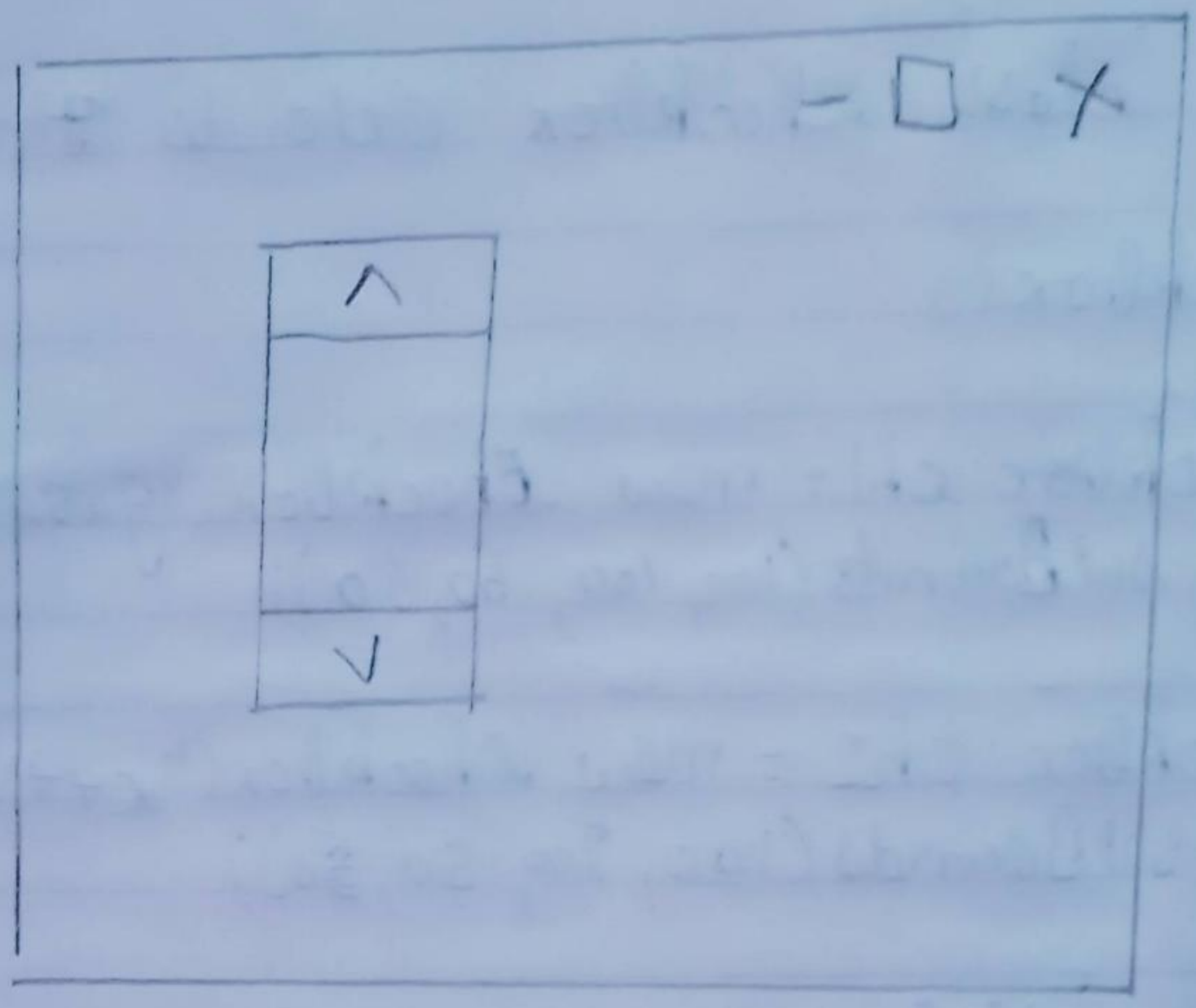

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W.A.P to create admission form.

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

public class form extends Frame
{
    Label l1, l2, l3, l4, l5, l6;
    Textfield t1, t3, t5, t6,
    Textarea t4;
    Checkbox c, c1, c2, c3, c4;
    Button b, b1;

    form()
    {
        this.setLayout(null);
        l1 = new Label("Name");
        l1.setBounds(70, 70, 40, 30);
        t1 = new Textfield();
        t1.setBounds(200, 70, 90, 20);
        l3 = new label("father name");
        l3.setBounds(40, 100, 50, 30);

        t3 = new textfield();
        t3.setBounds(200, 100, 90, 20);

        t4 = new Label("Address");
```

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```
l4 SetBounds(100,120,100,80);
~~t4=TextA~~
t4 = new TextArea();
t4.SetBounds(200,150,100,100);

l2 = new label("Gender")
l2.setBounds(90,340,100,20);

C=new Checkbox("Male")
C.SetBounds(200,180,130,150);
C1 = new checkbox("Female");
C1. SetBounds(400,280 150,150);

l6 = new Label("Category");
l6 .SetBounds(90, 230, 100,80);

t6 = new TextField();
t6. Set bounds(200 ,230 , 100,80);

l5 = new Label("Branch");
l5 . SetBounds(200, 440, 100, 20);

b1 = new Button("Reset");
b1. SetBounds(400, 500, 120,120);

b = new Button("Submit");
b. Set Bounds(700,500, 120,20);
```

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```
this.add(l1);
this.add(l3);
this.add(l4);
this.add(t1);
this.add(t3));
this.add(t6);
this.add(t5);
this.add(t2);
this.add(l6);
this.add(c2);
this.add(c3);
this.add(c);
this.add(c1);
this.add(c5);
this.add(b);
this.add(b1));

addWindowListner(new WindowAdapter
{
    public void
    windowClosing(WindowEvent e)
    {
     System.exit(0);
    }
});
```

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Admission Form

Name

Father name

Address

Category

Gender Male Female

Branch

Reset Submit

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