11/12/2023 (1)

#Program to print Hello World

```
class Print
{
public static void main(String a[])
{
System.out.println("Hello World");
}
}
```

Hello World

#Program to perform arithmatic operations.

```
class Calculator
{
public static void main(String args[])
{
int a=14;
int b=11;
System.out.println(a+b);
System.out.println(a-b);
System.out.println(a*b);
System.out.println(a/b);
}
}
```

25
3
154
1

Program to print fibonacci Series

```
class Fibon
{
public static void main(String args[])
{
int n1=0;
int n2=1;
int n3;
System.out.println(n1);
System.out.println(n2);
for(int i=0;i<=11;i++){
    n3=n1+n2;
    n1=n2;
    n2=n3;
    System.out.println(n3);
```

0
1
1
2
3
5
8
13
21
34
55
89
144
233

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Program to check a given number is prime or not

```
class Prime
{
public static void main(String args[])
{
 int a=23;
 if(a%2==0 || a%3==0 || a%5==0 || a%7==0)
{
System.out.println("The number is not prime");
}
else
{
System.out.println("The number is prime");
}
}
}
```

The number is prime

11/12/23

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LAB-2

Grocery amount calculator:-

```
import java.util.scanner
class Grocery
{
 double qtyDal, qtyPulses, qtySugar;
 Grocery( )
 {
  qtyDal=1;
  qtyPulses=1;
  qtySugar=0.5;
 }
 Grocery(double same)
 {
  qtyDal=qtyPulses=qtySugar='Same';
 }
 Grocery(double a, double b, double c)
 {
  qtyDal=a;
  qtyPulses=b;
  qtySugar=c;
 }
 Grocery (Grocery obj)
 {
  qtyDal=obj.qtyDal;
  qtyPulses=obj.qtyPulses;
  qtysugar=obj.qtySugar;
 }
 void calc.Amount( )
 {
  System.out.println("Total amount:");
  System.out.println(qtyDal*150+qtyPulses*80+qtySugar*50);
 }
}
class Main
{public static void main(String[]args)
 {
  Scanner input=new.Scanner(System.in);
  System.out.println("Enter Dal quantity:");
  double dal=input.nextDouble( );
  System.out.println("Enter pulses quantity:");
```

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```
double pulses = input.nextDouble();
System.out.println("Enter Sugar quantity: ");
double Sugar=input.nextDouble();

Grocery g1 = newGrocery();
Grocery g2 = newGrocery(dal);
Grocery g3 =newGrocery(dal,pulses, Sugar);
Grocery g4 = newGrocery(g3);

g1.calcAmount();
g2.calcAmount();
g3.calcAmount();
g4.calcAmount();
}
}
```

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① Quadratic Equation:-

```
import.java.util.Scanner;
class Quad
{
double a,b,c;
Quad(double a,double b, double c)
{
this.a=a;
this.b=b;
this.c=c;
}
void calc( )
{
double d=b*b-4*a*c;
double root1,root2;
if(a==0)
{
~~System.out.println("Roots are real and equal");~~
System.out.println("Please enter valid quadratic equation");
}
else
{
if(d==0)
{
System.out.println("Roots are real and equal");
System.out.println("Roots"+(-b/2*a));
root1=root2=(-b)/(2*a);
}
else if(d>0)
{
System.out.println("Roots are real and distinct");
root1=(-b+Math.sqrt(d))/(2*a);
root2=(-b+Math.sqrt(d))/(2*a);
System.out.println(root1+" "+root2);
}
```

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```
else
{
root1=(-b)/(2*a);
root2=Math.abs(d)/(2*a);
System.out.println("Roots are imaginary");
System.out.println(root1+"+i"+root2);
System.out.println(root1+"-i"+root2);
}
}
}
}

class Quadrun
{
public static void main(String[] args)
{
Scanner input=new Scanner(System.in);
System.out.print("Enter value of a: ");
double a=input.nextDouble();
System.out.print("Enter value of b: ");
double b =input.nextDouble();
System.out.print("Enter value of c: ");
double c =input.nextDouble();
Quad quadratic=new Quad(a,b,c);
quadratic.calc();
input.close();
}
}
```

② SGPA

```
import java.util.Scanner;
class Student{
String usn,name;
int n;
int marks[];
int credits[];
void inputMarks()
{
Scanner input=new Scanner(System.in);
System.out.print("Enter USN: ");
usn=input.nextLine();
System.out.print("Enter Name: ");
name=input.nextLine();
System.out.print("Enter number of subjects: ");
n=input.nextInt();
System.out.print("Enter Credits:");
credits=new int[n];
marks=new int[n];
for (int i=0;i<n;i++)
{
System.out.print("Enter marks of Subject "+(i+1)+": ");
marks[i]=input.nextInt();
System.out.print("Enter credits of Subjects "+(i+1)+": ");
credits[i]=input.nextInt();
}
}
int gradePoints(double marks)
{
if (marks>=90)
return 10;
else if(marks>=80)
return 9;
else if(marks>=70)
return 8;
else if(marks>=60)
return 7;
else if(marks>=50)
return 6;
```

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```
else
return 0;
}

double sgpa()
{
double totalcredits = 0, sum=0;
for(int i=0; i<n ; i++)
{
total credits =totalcredits +credits[i];
sum=sum+gradepoints(marks[i])*credits[i];
}
return(sum/totalcredits);
```

Output:-

```
Enter USN: 1BM22CS0878
Enter Name: Charan G
Enter the number of Subjects : 8
Enter Credits of Subjects 1 : 4
Enter the marks of Subject1:98
Enter Credits of Subjects 2: 4
Enter the marks of Subject2 : 98
Enter Credits of Subject3: 3
Enter the marks of Subject3: 97
Enter the Credits of Subject4 : 3
Enter the marks of Subject4: 95
Enter the Credits of Subject 5: 3
Enter marks of Subject 5: 91
Enter marks of Subject6: 1
Enter credits of Subject6: 95
Enter the credits of Subject 7: 1
Enter the credits of Subjet8 : 95
Enter the marks of Subjects8: 1
Enter the marks of Subject7: 97
```

VSN: 1BM22CS086
Name: Dhanush S
SGPA: 9.95

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Output: Enter value of a: 2
Enter value of b: 2
Enter value of c: 4
Roots are imaginary
-0.5+1.32i
-0.5-1.32i

Enter value of a: 1
Enter value of b: 5
Enter value of c: 6
Roots are real and distinct
-3 -2

Enter value of a: 4
Enter value of b: 12
Enter value of c: 9
Roots are real and equal
-3/2 -3/2

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LAB-3 22/11/2024

Book Objects

Create a class Book that contains four members, name, author, price and num-pages. Include a constructor to set the values for the members. Include methods to set and get the details of the objects. Include a to String() method that could display the complete details of the book.
Develop a java program to create n book objects.

```
import java.util.Scanner;
class Books
{
 String name,author;
 int price, num-pages;
 Books(String name, String author, int price, int num_pages)
 {
    this.name = name;
    this.author = author;
    this.price = price;
    this.num-pages = num-pages;
 }
 Scanner input = new Scanner(System.in);
 Books()    //Default constructor
 { }
void accept()
 {
  System.out.print("Enter name of book :");
  name = input.nextLine();
  System.out.print("Enter name of author:");
  author = input.nextline();
  System.out.print("Enter price of book:");
  price = input.nextInt();
  System.out.print("Enter no. of pages in the book:");
  num-pages = input.nextInt();
  System.out.print("\n");
 }
public String to String()
 { String name, author, int price, num-pages;
  name = "Book name:" + this.name + "\n";
  author = "Author name:" + this.author + "\n";
  price = "Price:" + this.price + "Rs\n".
```

```
num_pages = "Number of pages: " + this.num_pages +
            "pages\n";

return name + author + price + num_pages;
}
}

class Book Run
{
    public static void main(String[ ]args)
    {
     Scanner input = new Scanner(System.in);
     System.out.print("Enter number of books : ");
     int n = input.nextInt();
     System.out.print("\n");
 Books[ ]  book = new Books[n];
 for(int i=0;i<n;i++)
   { System.out.println("Book" + (i+1) + "!");
     book[i] = newBooks();
     book[i].accept();
   }
for(int i=0;i<n;i++)
{
 System.out.println("Book" + (i+1) + " : \n" + book[i] + "\n");
 }
 input.close();
}
}
```

Output:-

```
Enter number of books : 2

Book 1;
Enter name of book: Harry Potter and the Chamber of Secrets.
Enter price of the book: 418
Enter no. of pages in the book: 341
Book 2:
Enter name of books : Adventures of Vibinn Neothan
Enter name of author: Dhanush S
Enter price of the book: 300
Enter no. of pages in the book: 250
```

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Book1:

Book name: Harry Potter and The Chamber of Secrets.

Author name: J.K. Rowling

Price: 418 Rs

Number of pages = 341 pages

Book 2:

Book name: Adventures of Vibinn Noothan

Author name: Dhanush S

Price: 300 Rs

Number of pages: 250 pages

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Abstract Shape Class. 22/11/2024

Develop a java program to create an abstract class named Shape that contains two integers and the empty method named printArea(). Provide the classes named Rectangle, Triangle and Circle in that each one of the classes extends the class Shape. Each one of the class contains only the method printArea() that prints the area of the given Shape.

```
import java.util.Scanner;
abstract class Shape
{
  double x,y;
  Shape(double x, double y)
  {
    this.x=x;
    this.y=y;
  }
  abstract void printArea();
}
class Rectangle extends Shape
{
  Rectangle(double x, double y)
  { Super(x,y); }
  void printArea()
  {
    System.out.println("Area of Rectangle: " +(x*y)
                + "Square units \n")

class Triangle extends shape
{
  Triangle(double x, double y)
  { Super(x,y); }
  void printArea()
  {
    System.out.println("Area of Triangle: "+ (0.5*x*y) +
                "Square units\n");
  }
}
class Circle extends shape
{
  Circle(double x)
  { Super(x,0); }
  void printArea()
  {
```

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```
System.out.println("Area of circle: " +
                    "Square units\n");
    }
}

class ShapeRun
{public static void main(String[] args)
  {
    double x, y;
    Scanner input = new Scanner(System.in);
    System.out.println("Enter length & width of Rectangle: ");
    x = input.nextDouble();
    y = input.nextDouble();
    Rectangle rectangle = new Rectangle(x, y);
    rectangle.printArea();
    System.out.println("Enter length & base of triangle)
    x = input.nextDouble();
    y = input.nextDouble();
    Triangle triangle = new Triangle(x, y)
    triangle.printArea();

    input.close();
  }
}
```

Output:-

```
Enter length and width of Rectangle:
10
20
Area of Rectangle: 200.0 Square Units
Enter height and base of Triangle:
10
20
Area of Triangle: 100.0 Square Units.
Enter radius of circle:
10
Area of circle: 314.0 Square units.
```

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Bank

22/1/2024

```
import java.util.Scanner;
class Account {
    String customerName;
    int accountNumber;
    String accountType;
    double balance;

    Account(String customerName, int accountNumber,
            String accountType, double balance) {
        this.customerName = customerName;
        this.accountNumber = accountNumber;
        this.accountType = accountType;
        this.balance = balance;
    }

    void deposit(double amount) {
        balance += amount;
        System.out.println("Deposit of "+amount+" Successfull!");
    }

    void displayBalance() {
        System.out.println("Balance: "+ balance);
    }

void withdraw(double amount) {
    if (balance-amount <0) {
        System.out.println("Insufficient balance");
        return;
    }
    balance-=amount;
    System.out.println("Withdrawl of "+amount+" Successfull!)
                        .Updated balance: "+balance);

    }

else
    { System.out.println("In Insufficient funds withdrawal failed!n");
}}
}
```

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```
Class Savings Account extends Account
{
 Savings Account(String customer Name, long account
                 Number, double balance)
  {
   Super(customerName, accountNumber, "Savings", balance);
  }

 void interest (double rate)
 {
  double interest = balance * rate/100;
  balance = balance + interest;
  System.out.println("Interest computed and deposited.
                     Updated balance :" + balance);

 }

 class current Account extends Account
 {
  double minuimum Balance;
  double service charge;

  current Account (String customerName, long account number
                   double balance, double minuimumBalance,
                   double service charge)

  {
   Super(CustomerName, accountNumber, "current", balance);
   this.minuimum Balance = minuimum Balance;
   this.service charge = service charge;
  }

 void check minuimum Balance()
 {
  if(balance < minuimum Balance)
  {
   balance = balance - Service Charge;
   System.out.println("\n Minuimum balance not maintained
                      Service charge imposed. Balance:
                      " + balance);

  }
  else
  {
   System.out.println("\n Minuimum balance maintained
                      Service charge not imposed,
                      Balance :" + balance);
  }
 }
```

Scanned with OKEN Scanner

```
void cheque(double amount)
{
 balance = balance-amount;
 System.out.println("\n Withdrawl of "+amount+"Successfull
                    Updated balance:"+balance);
 }
}

class Bank
{
 public static void main(String[] args)
 {
  Scanner input = new Scanner(System.in);
  System.out.println("Savings Account:");
  System.out.println(" Enter Customer name:");
  String name = input.nextline();
  System.out.println("Enter balance:");
  double balance = input.nextDouble();
  SavingsAccount SA = new SavingsAccount(name, na
                                balance);
  System.out.println("\n Current Account:\n");
  System.out.print ln("Enter Customer name:");
  name = input.nextline();
  System.out.println("Enter account number:");
  no = input.nextlong();
  System.out.println("Enter balance:");
  balance = input.nextDouble();
  System.out.println("Enter minuimum Balance:");
  double minBalance = input.nextDouble();
  System.out.print("Enter service charge:");
  double charge = input.nextDouble();
  CurrentAccount CA = new CurrentAccount(name, no, balance,
                                minBalance, charge);
  System.out.print("Enter deposit for Savings:");
  double DS = input.nextDouble();
  SA.deposit(DS);
```

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```
System.out.print("Enter Interest rate of Savings:");
double IS = input.nextDouble();
SA.interest(IS);

System.out.print("Enter withdrawl amount of Savings:");
double WS = input.nextDouble();
SA.withdraw(WS);

System.out.print("Enter deposit of Current:");
double DC = input.nextDouble();
CA.deposit(DC);

System.out.print("Enter withdrawl of Current:");
double WC = input.nextDouble();
CA.cheque(WC);

System.out.print("\n Find Balances:");
System.out.println("Savings Account:");
SA.displayBalance();

System.out.println("\n Current Account:");
CA.displayBalance();
  }
}
```

Output:-

```
Savings Account:
Enter Customer name: Dhanush
Enter account number: 100
Enter balance: 50000

Current Account:
Enter Customer name: Charan G
Enter Account number: 200
Enter balance: 150000
Enter minimum balance: 20000
Enter Service charge: 10
Enter deposit amount for Saving Account: 10000
Deposit of 10000.0 was successful. Balance: 60000.0
```

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Enter interest rate for Savings Account: 5
Interest computed and deposited. Update balance: 63000.0

Enter withdrawl amount for Savings Account: 2000
withdrawl 2000.0 was Successful
Update balance: 61000.0

Enter deposit amount for current account: 20000
Deposit of 20000.0 Successfull. Update balance:
170000.0

Enter withdrawl amount for Current Amount: 50000
withdrawl of 50000.0 Successfull. Updated balance:
120000.0

Find Balances:
Savings Account:
Account Number: 100
Customer Name: Dhanush S
Account Type: Savings
Balance: 61000.0

Current Account:
Account Number: 200
Customer name: Sangeetha
Account Type: Current
Balance: 120000.0.

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Package CIE which has 2 classes - Student & Internals.

Package SEE which has class - External → Derived class of Student

```
Public class Student {
    public String usn, name;
    public int sem;
    public Student(String usn, String name, int sem){
      this.usn = usn;
      this.name = name;
      this.sem = sem;
    }
}

Package CIE;
import CIE.Student;
public class internals extends Student {
  public double[] internalMarks = new double[5];
  public Internals (String usn, String name, int sem,
          double[] internalMarks){
    Super (usn, name, sem);
    this.internal marks = internalMarks;
    }
}
package CIE;

package SEE;
import CIE.* ;
public class External extends Student {
    public double[] internal SeeMarks = new double[5];
    public External(String usn, String name, int Sem,
                double[] SeeMarks){
        Super (usn, name, sem);
        this.SeeMarks = SeeMarks;
    }
}
```

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```
import CIE.Internals;
import SEE.External;
import java.util.Scanner;

public class FinalMarks {
    public static void main(String[] args){
    Scanner input= new Scanner(System.in);

    System.out.print("Enter the number of Students: ");
    int n=input.nextInt();
    input.nextLine();

    Internals[] internals= new Internals[n];
    External[] externals = new External[n];

    //input Internal Marks
    for(int i=0;i<n;i++){
        System.out.println("Enter details for internal Marks
                                of Student "+(i+1));
        System.out.print("Enter USN:");
        String usn = input.next();
        System.out.print("Enter Name: ");
        String name=input.next();
        System.out.print("Enter Semester: ");
        int sem=input.nextInt();
        input.nextLine();
        double[] internalMarks =new double[5];
        System.out.print("Enter Internal Marks for
                                5 Courses: ");
        for(int j=0;j<5;j++){
            internalMarks[j] =input.nextDouble();
        }
        internals[i] =new Internals(usn, name, sem,
                                internalMarks);
```

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```
for (int i=0; i<n; i++){
 System.out.println("Enter details for SEE marks of
                    Student "+(i+1));
System usn= internals[i].usn;
String name =internals[i].Sem;
double [] seeMarks = new double[5];
System.out.print("Enter SEE Marks for 5 Courses:");
 for (int j=0; j<5; j++){
      See Marks[j] = input.nextDouble();
 }
 external[i] = new External [usn, name, Sem,
                    SeeMarks);

}
System.out.println("\n Final Marks of Students:");
for (int i=0; i<n; i++){
 System.out.print\n("Student"+ (i+1)+": USN: "+
 internals[i].usn + "\n Name: "+ internals[i].name
 +"\n Semester: "+ internals[i].sem);
 System.out.print ("Total Marks: ");
 for (int j=0; j<5; j++){
  System.out.println("Subject "+(j+1)+ ": "+
  ((internals[i].internal Marks[j] /2 )+ (external[i].
  SeeMarks[j] /2 ))+ "\n");

 }
 System.out.println();

}
}
}
```

Output:

Enter the number of Students : 2
Enter details of Student 1
Enter USN : 078
Enter Name : charan G
Enter Semester : 3
Enter Internal Marks for 5 Course : 80
90
80
85
100
Enter details of Student 2
Enter USN : 086
Enter name : Dhanush S
Enter Semester : 3
Enter Internal Marks for 5 Courses : 80
90
90
80
80
Enter SEE marks for 5 courses of Student 1
80
80
90
95
100
Enter SEE Marks for 5 Courses for Student 2
90
90
95
100
95

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Find Marks of Students:

Student 1:

USN: 078

Name: Charan G

Semester: 3

Subject1: 80.0

Subject2: 85.0

Subject3: 85.0

Subject4: 90.0

Subject5: 100.0

Student 2:

USN: 086

Name: Dhanush S

Semester: 3

Subject1: 85.0

Subject2: 90.0

Subject3: 92.5

Subject4: 90.0

Subject5: 77.5

Bailey

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Lab-program-7

Father and Son-Age Exception

Program: Throw exceptions if father age<0 & Son age >= father age with Son's class inherriting father class:-

```
import java.util.Scanner;
class wrongAge extends Exception
{
  public wrongAge(String str)
  {
    super(str);
  }
}

class Father
{int fatherAge;
 Father(int fatherAge) throws wrongAge
 {this.fatherAge=fatherAge;
  if(fatherAge<0)
   {throw new wrongage("Father's Aage cannot be less
                                than zero");
   }
 }
}

class Son extends father
{ int sonAge;
  Son(int fatherAge, int sonAge) throws WrongAge
  { super(fatherAge);
    this.sonAge=sonAge;
    if(SonAge<0)
     {
      throw new WrongAge("Son's Age cannot be less than zero");
     }
    if(SonAge>=fatherAge)
     {
      throw new WrongAge("Son's age cannot be greater than or
                                equal to father's age");
     }
}  }
```

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```
class MainAge
{
 public static void main(String[] args)
 {
  Scanner input = new Scanner(Scanner.in);
  System.out.print("Enter father's age:");
  int fatherAge = input.nextInt();
  System.out.print("Ento Son's Age:");
  int sonAge = input.nextInt();

  try {
  Son son = new Son(fatherAge, sonAge);
  System.out.println("Father's and Son's age are valid");
  }
  Catch(WrongAge e)
   {
    System.out.println("Exception:" + e);
   }
 }
}
```

Output:-

① Enter father's age : 50
Enter son's age : 20
Father's and Son's age are valid

② Enter father's age : 50
Enter Son's age : 60
Exception : Wrong Age : Son's age Cannot be greater than or equal to father's age.

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Multithreading

Write a program which creates 2 threads, One thread displaying "BMS College of Enginnering" Once every ten Seconds and another displaying "CSE" once every two Seconds.

```
class BMSdisplay extends Thread
{
 public void run()
 {
  for(int i=0;i<3;i++)
   {
    System.out.println("BMS College of Engineering");
    try
    {
     Thread.sleep(10000);
    }
    catch(Interrupted Exception e)
    {
     System.out.println("Exception! "+e);
    }
   }
 }
}
class CSEdisplay extends Thread
{
public void run()
 {
  for(int i=0;i<10;i++)
   { System.out.println("CSE");
    try {
     Thread.Sleep(2000);
    }
    catch(Interrupted Exception e)
    {
     System.out.println("Exception: "+e);
    }
   }
}
}
```

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```
class BMSthread
{ public static void main(String[]args)
  {BMSdisplay bms = new BMSdisplay();
   CSEdisplay cse = new CSEdisplay();
   bms.start();
   cse.start();
  }
}
```

Output:-

```
BMS College of Engineering
CSE
CSE
CSE
CSE
CSE
BMS College of Engineering
CSE
CSE
CSE
CSE
CSE
BMS College of Engineering
```

19.08.24

Scanned with OKEN Scanner

① creating label, button and Textfield in a frame using AWT.

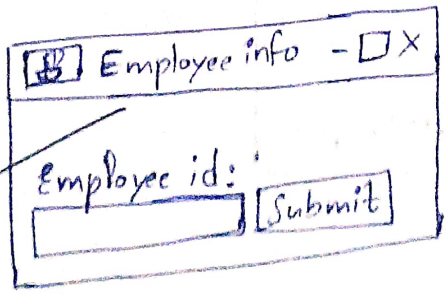
26/02/2024

```
import java.awt.*;
import java.awt.event.*;
public class AWTExample extends WindowAdapter{
 frame f;
 AWTExample(){
      f= newframe();
      f.addWindowListener(this);
      Label l=new Label("Employee id:");
      Button b=new Button("submit");
      Textfield t=new Textfield();

      l.setBounds(20,80,80,30);
      t.setBounds(20,100,80,30);
      b.setBounds(100,100,80,30);

      f.add(b);
      f.add(l);
      f.add(t);
      f.setSize(400,300);
      f.setTitle("Employee info");
      f.setLayout(null);
      f.setVisible(true);
 }
 public void windowClosing(WindowEvent e){
   System.exit(0);
 }
 public static void main(String[] args){
   AWTExample awt_obj = new AWTExample();
 }
}
```

Output:



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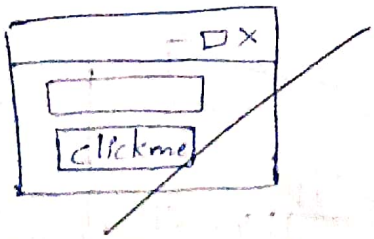
② Create a button and add a action listener for mouse click

```
import java.awt.*;
import java.awt.event.*;
public class EventHandling extends WindowAdapter implements
                                    ActionListener{

    frame f;
    TextField tf;
    EventHandling(){

     f= new frame();
     f.addWindowListener(this);
     tf=new TextField();
     tf.setBounds(60,50,170,20);
     Button b=new Button("click me");
     b.setBounds(100,120,80,30);
     b.addActionLister(this);
     f.add(b); f.add(tf);
     f.setSize(300,300);
     f.setLayout(null);
     f.setVisible(true);
    }
    public void actionPerformed(ActionEvent e){
    tf.setText("Welcome");
    }
    public void windowClosing(WindowEvent e){
        System.exit(0);
    }
    public static void main(String args[]){
    new EventHandling();
    }
}
```

Output:-



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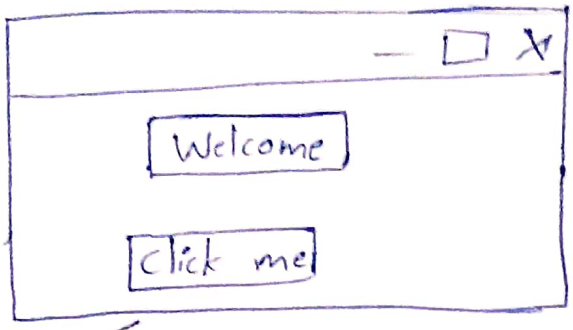
After clicking on 'click-me'



26.02.24

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