



PREFACE

CERTIFICATE

This is to certify that

Mr. Ashishranjan Prasad with enrolment no. **190303105021** and semester/division

5B1 has successfully completed his laboratory experiments in the Object-Oriented

Programming with Java (203105334) from the department of Computer Science And

Engineering during the academic year 2021-2022.



Date of Submission:

Staff In Charge:

Head of Department:

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Enrolment no.: - 190303105021



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PRACTICAL – 8

Aim: - Write a program to design student registration form using AWT components.

Code: -

```
import java.awt.*;

class Registration extends Frame{

    Registration() {

        Label name    = new Label("Name : ");
        Label enrollno = new Label("Enrollment No : ");
        Label email    = new Label("Email : ");
        Label gender   = new Label("Gender : ");
        Label dob      = new Label("DOB : ");
        CheckboxGroup cggender = new CheckboxGroup();
        Checkbox male   = new Checkbox("Male", false);
        Checkbox female = new Checkbox("Female", false);
        TextField tfname = new TextField();
        TextField tfenrollno = new TextField();
        TextField tfemail = new TextField();
        TextField tfdob = new TextField();
        Button submit = new Button("Submit");

        add(name);
        add(enrollno);
        add(email);
        add(gender);
        add(male);
        add(female);
        add(tfname);
        add(tfenrollno);
        add(tfemail);
```



```
add(tfdob);
add(submit);
add(dob);
name.setBounds(15, 30, 100, 20);
tfname.setBounds(120, 30, 250, 20);
enrollno.setBounds(15, 60, 100, 25);
tfenrollno.setBounds(120, 60, 250, 20);
email.setBounds(15, 90, 100, 20);
tfemail.setBounds(120, 90, 250, 20);
dob.setBounds(15, 120, 100, 20);
tfdob.setBounds(120, 120, 250, 20);
gender.setBounds(15, 150, 100, 20);
male.setBounds(120, 150, 250, 20);
female.setBounds(120, 170, 250, 20);
submit.setBounds(30, 250, 200, 30);
setTitle("Registration Form");
setSize(460,390);
setLayout(null);
setVisible(true);
}

public static void main(String[] args) {
    new Registration();
}

}
```



Output: -

The screenshot shows a window titled "Registration Form" with a standard Windows title bar (minimize, maximize, close buttons). The form contains the following fields and controls:

- Name :** Text box containing "Ashishranjan Prasad"
- Enrollment No :** Text box containing "190303105021"
- Email :** Text box containing "190303105021@paruluniversity.ac.in"
- DOB :** Text box containing "16/07/2002"
- Gender :** Radio button group with "Male" selected (checked) and "Female" unselected.
- Submit** button at the bottom.



PRACTICAL – 8.1

Aim: - Write a Java Program for Calculator Operations Using AWT Controls & appropriate layout manager.

Code: -

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

class MyCalc extends WindowAdapter implements ActionListener{
    Frame f;
    Label l1;
    Button b1,b2,b3,b4,b5,b6,b7,b8,b9,b0;
    Button badd,bsub,bmult,bdiv,bmod,bcalc,bclr,bpts,bneg,bback;
    double xd;
    double num1,num2,check;

    MyCalc(){
        f= new Frame("MY CALCULATOR");
        l1=new Label();
        l1.setBackground(Color.LIGHT_GRAY);
        l1.setBounds(50,50,260,60);
        b1=new Button("1");
        b1.setBounds(50,340,50,50);
        b2=new Button("2");
        b2.setBounds(120,340,50,50);
        b3=new Button("3");
        b3.setBounds(190,340,50,50);
        b4=new Button("4");
        b4.setBounds(50,270,50,50);
        b5=new Button("5");
        b5.setBounds(120,270,50,50);
```




```
b6=new Button("6");
b6.setBounds(190,270,50,50);
b7=new Button("7");
b7.setBounds(50,200,50,50);
b8=new Button("8");
b8.setBounds(120,200,50,50);
b9=new Button("9");
b9.setBounds(190,200,50,50);
b0=new Button("0");
b0.setBounds(120,410,50,50);
bneg=new Button("+/-");
bneg.setBounds(50,410,50,50);
bpts=new Button(".");
bpts.setBounds(190,410,50,50);
bback=new Button("back");
bback.setBounds(120,130,50,50);

badd=new Button("+");
badd.setBounds(260,340,50,50);
bsub=new Button("-");
bsub.setBounds(260,270,50,50);
bmult=new Button("*");
bmult.setBounds(260,200,50,50);
bdiv=new Button("/");
bdiv.setBounds(260,130,50,50);
bmod=new Button("%");
bmod.setBounds(190,130,50,50);
bcalc=new Button("=");
bcalc.setBounds(245,410,65,50);
```



```
bclr=new Button("CE");  
bclr.setBounds(50,130,65,50);  
  
b1.addActionListener(this);  
b2.addActionListener(this);  
b3.addActionListener(this);  
b4.addActionListener(this);  
b5.addActionListener(this);  
b6.addActionListener(this);  
b7.addActionListener(this);  
b8.addActionListener(this);  
b9.addActionListener(this);  
b0.addActionListener(this);  
  
bpts.addActionListener(this);  
bneg.addActionListener(this);  
bback.addActionListener(this);  
  
badd.addActionListener(this);  
bsub.addActionListener(this);  
bmult.addActionListener(this);  
bdiv.addActionListener(this);  
bmod.addActionListener(this);  
bcalc.addActionListener(this);  
bclr.addActionListener(this);  
  
f.addWindowListener(this);  
//ADDING TO FRAME  
f.add(l1);
```



```
f.add(b1); f.add(b2); f.add(b3); f.add(b4); f.add(b5); f.add(b6); f.add(b7); f.add(b8); f.add(b9); f.add(b0);
```

```
f.add(badd); f.add(bsub); f.add(bmod); f.add(bmult); f.add(bdiv); f.add(bmod); f.add(bcalc);
```

```
f.add(bclr); f.add(bpts); f.add(bneg); f.add(bback);
```

```
f.setSize(360,500);
```

```
f.setLayout(null);
```

```
f.setVisible(true);
```

```
}
```

```
//FOR CLOSING THE WINDOW
```

```
public void windowClosing(WindowEvent e) {
```

```
f.dispose();
```

```
}
```

```
public void actionPerformed(ActionEvent e) {
```

```
String z,zt;
```

```
//NUMBER BUTTON
```

```
if(e.getSource()==b1) {
```

```
zt=l1.getText();
```

```
z=zt+"1";
```

```
l1.setText(z);
```

```
}
```

```
if(e.getSource()==b2) {
```

```
zt=l1.getText();
```

```
z=zt+"2";
```

```
l1.setText(z);
```



```
}  
  
if (e.getSource () == b3) {  
    zt = l1.getText ();  
    z = zt + "3";  
    l1.setText (z);  
}  
  
if (e.getSource () == b4) {  
    zt = l1.getText ();  
    z = zt + "4";  
    l1.setText (z);  
}  
  
if (e.getSource () == b5) {  
    zt = l1.getText ();  
    z = zt + "5";  
    l1.setText (z);  
}  
  
if (e.getSource () == b6) {  
    zt = l1.getText ();  
    z = zt + "6";  
    l1.setText (z);  
}  
  
if (e.getSource () == b7) {  
    zt = l1.getText ();  
    z = zt + "7";  
    l1.setText (z);  
}  
  
if (e.getSource () == b8) {  
    zt = l1.getText ();  
    z = zt + "8";
```



```
l1.setText(z);  
}  
if(e.getSource()==b9){  
    zt=l1.getText();  
    z=zt+"9";  
    l1.setText(z);  
}  
if(e.getSource()==b0){  
    zt=l1.getText();  
    z=zt+"0";  
    l1.setText(z);  
}  
  
if(e.getSource()==bpts){    //ADD DECIMAL PTS  
    zt=l1.getText();  
    z=zt+".";  
    l1.setText(z);  
}  
if(e.getSource()==bneg){    //FOR NEGATIVE  
    zt=l1.getText();  
    z="-"+zt;  
    l1.setText(z);  
}  
  
if(e.getSource()==bback){    // FOR BACKSPACE  
    zt=l1.getText();  
    try{  
        z=zt.substring(0, zt.length()-1);  
    }catch(StringIndexOutOfBoundsException f){return;}  
}
```



```
l1.setText(z);
}

//AIRTHMETIC BUTTON

if(e.getSource()==badd) { //FOR ADDITIO
N
try{
    num1=Double.parseDouble(l1.getText());
} catch (NumberFormatException f) {
    l1.setText("Invalid Format");
    return;
}
z="";
l1.setText(z);
check=1;
}

if(e.getSource()==bsub) { //FOR SUBTRACT
ION
try{
    num1=Double.parseDouble(l1.getText());
} catch (NumberFormatException f) {
    l1.setText("Invalid Format");
    return;
}
z="";
l1.setText(z);
check=2;
}

if(e.getSource()==bmult) { //FOR MULTIPLI
CATION
try{
```



```
num1=Double.parseDouble(l1.getText());
} catch (NumberFormatException f) {
    l1.setText("Invalid Format");
    return;
}

z="";
l1.setText(z);
check=3;
}

if(e.getSource()==bdiv) {                                //FOR DIVISION
try{
    num1=Double.parseDouble(l1.getText());
    } catch (NumberFormatException f) {
        l1.setText("Invalid Format");
        return;
    }
    z="";
    l1.setText(z);
    check=4;
}

if(e.getSource()==bmod) {                                //FOR MOD/REMAIN
DER
try{
    num1=Double.parseDouble(l1.getText());
    } catch (NumberFormatException f) {
        l1.setText("Invalid Format");
        return;
    }
    z="";
```



```
l1.setText(z);  
check=5;  
}  
  
//RESULT BUTTON  
if(e.getSource()==bcalc){  
try{  
    num2=Double.parseDouble(l1.getText());  
}catch(Exception f){  
    l1.setText("ENTER NUMBER FIRST");  
    return;  
}  
if(check==1)  
    xd =num1+num2;  
if(check==2)  
    xd =num1-num2;  
if(check==3)  
    xd =num1*num2;  
if(check==4)  
    xd =num1/num2;  
if(check==5)  
    xd =num1%num2;  
l1.setText(String.valueOf(xd));  
} //FOR CLEARING THE LABEL and Memory  
if(e.getSource()==bclr){  
    num1=0;  
    num2=0;  
    check=0;  
    xd=0;  
    z="";
```




```
l1.setText(z);  
  
}  
  
//MAIN METHOD where objects of MyCalc is instantaiated  
public static void main(String args[]){  
    new MyCalc();  
}  
}
```

Output: -





PRACTICAL – 9

Aim: - Write a program to demonstrate array index out of bounds exception.

Code: -

```
public class fact {  
    public static void main(String[] a) {  
        int number;  
        number = Integer.parseInt(a[0]);  
        int n = 1;  
        for (int i = 1; i <= number; i++) {  
            n = n * i;  
        }  
        System.out.println("The factorial of " + number + " is  
" + n);  
    }  
}
```

Output: -

```
PS D:\5th Semester\OOPJ\Lab> javac fact.java  
PS D:\5th Semester\OOPJ\Lab> java fact  
Exception in thread "main" java.lang.ArrayIndexOutOfBoundsException: Index 0 out of bounds for length 0  
at fact.main(fact.java:5)
```



PRACTICAL – 9.1

Aim: - Create an interface Account with two methods deposit and withdraw. Create class Savings Account which implements the interface. Write a custom Exception handler for Savings Account to handle the scenarios when withdrawn amount is larger than the balance in the account.

Code: -

```
interface Account {  
    void deposit(int amount);  
    void withdraw(int amount) throws InsufficientFundsException;  
}  
  
class SavingAccount implements Account {  
    int Balance = 3000;  
    public void deposit(int amount) {  
        Balance = Balance + amount;  
        System.out.println("Balance after deposit is : " + Balance);  
    }  
    public void withdraw(int amount) throws InsufficientFundsException {  
        if (amount > Balance) {  
            throw new InsufficientFundsException("Insufficient Funds");  
        } else {  
            Balance = Balance - amount;  
            System.out.println("Balance after deposit is : " + Balance);  
        }  
    }  
}  
  
class InsufficientFundsException extends Exception {
```



```
public InsufficientFundsException(String msg) {  
    super(msg);  
}  
  
}  
  
public class practical_9_1 {  
    public static void main(String[] args) throws Insufficient  
FundsException {  
        SavingAccount sA = new SavingAccount();  
        sA.deposit(5000);  
        sA.withdraw(3000);  
        sA.withdraw(6000);  
    }  
}
```

Output: -

```
Balance after deposit is : 8000  
Balance after deposit is : 5000  
Exception in thread "main" InsufficientFundsException: Insufficient Funds  
    at SavingAccount.withdraw(practical_9_1.java:13)  
    at practical_9_1.main(practical_9_1.java:30)
```



PRACTICAL – 10

Aim: - Write a program to demonstrate class object locking using method level Synchronization.

Code: -

```
public class practical_10 implements Runnable{
    public void run(){
        Lock();
    }
    public void Lock() {
        System.out.println(Thread.currentThread().getName());
        synchronized(this) {
            System.out.println("in block " + Thread.currentThread().getName());
            System.out.println("in block " + Thread.currentThread().getName() + " end");
        }
    }
    public static void main(String[] args) {
        practical_10 p = new practical_10();
        Thread t1 = new Thread(p);
        Thread t2 = new Thread(p);
        practical_10 p1 = new practical_10();
        Thread t3 = new Thread(p1);
        t1.setName("t1");
        t2.setName("t2");
        t3.setName("t3");
        t1.start();
        t2.start();
        t3.start();
    }
}
```



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}

}

Output: -

```
t1
t2
t3
in block t1
in block t3
in block t1 end
in block t3 end
in block t2
in block t2 end
```



PRACTICAL – 10.1

Aim: - Write a program that executes two threads. One thread will print the even numbers and another thread will print odd numbers from 1 to 50.

Code: -

```
public class practical_10_1 {  
    int counter = 1;  
    static int N;  
  
    public void odd(){  
        synchronized (this){  
            while (counter < N){  
                while (counter % 2 == 0) {  
                    try {  
                        wait();  
                    } catch (InterruptedException e) {  
                        e.printStackTrace();  
                    }  
                }  
                System.out.println(counter + " " + "odd");  
                counter++;  
                notify();  
            }  
        }  
    }  
  
    public void even(){  
        synchronized (this){  
            while (counter < N){  
                while (counter % 2 == 1) {  
                    try {
```



```
        wait();
    } catch (InterruptedException e) {
        e.printStackTrace();
    }
}
System.out.println(counter + " " + "even");
counter++;
notify();
}
}

public static void main(String[] args) {

    practical_10_1 oE = new practical_10_1();
    N = 50;
    Thread t1 = new Thread(new Runnable() {
        @Override
        public void run() {
            oE.odd();
        }
    });
    Thread t2 = new Thread(new Runnable() {
        @Override
        public void run() {
            oE.even();
        }
    });
    t1.start();
    t2.start();
}
```




}

}

Output: -

```
1 odd
2 even
3 odd
4 even
5 odd
6 even
7 odd
8 even
9 odd
10 even
11 odd
12 even
13 odd
14 even
15 odd
16 even
17 odd
18 even
19 odd
20 even
21 odd
22 even
23 odd
39 odd
40 even
41 odd
42 even
43 odd
44 even
45 odd
46 even
47 odd
48 even
49 odd
50 even
```