**Practicals programs of java**

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**Section – A**

**Question Number --- 01**

1. Design a class Complex having a real part (x) and an imaginary part (y). Provide methods to perform the following on complex numbers:

a) Add two complex numbers.

b) Multiply two complex numbers.

c) toString() method to display complex numbers in the form: x + i y

**Program**

package project;

public class Q1\_complex\_number {

public double x, y;

Q1\_complex\_number(double x, double y) {

this.x = x;

this.y = y;

}

Q1\_complex\_number add(Q1\_complex\_number a) {

double c= x + a.x;

double b = y + a.y;

return new Q1\_complex\_number(c,b);

}

Q1\_complex\_number multiply(Q1\_complex\_number a){

double c = (x \* a.x) - (y \* a.y);

double b = (x \* a.y) + (y \* a.x);

return new Q1\_complex\_number(c,b);

}

void tostring() {

System.out.print("the complex number is : ");

if (y > 0) {

System.out.println(x + " + " + y + "i");

} else if (y < 0) {

System.out.println(x +""+ y + "i");

}

}

}

class demo {

public static void main(String arg[]) {

Q1\_complex\_number a = new

Q1\_complex\_number(5, -6);

Q1\_complex\_number b = new

Q1\_complex\_number(4, 7);

Q1\_complex\_number c = a.add(b);

Q1\_complex\_number d = a.multiply(b);

a.tostring();

b.tostring();

c.tostring();

d.tostring();

}

}

**Question Number --- 02**

2) Create a class TwoDim which contains private members as x and y coordinates in package P1. Define the default constructor, a parameterized constructor and override toString() method to display the co-ordinates. Now reuse this class and in package P2 create another class ThreeDim, adding a new dimension as z as its private member.

Define the constructors for the subclass and override toString() method in the subclass also. Write appropriate methods to show dynamic method dispatch. The main() function should be in a package P.

**Program**

***// make two\_d class in package p1.***

package p1;

public class two\_d {

private double x;

private double y;

public two\_d(double a, double b) {

x = a;

y = b;

}

public String toString() {

return x + " , " + y;

}

}

**//make three\_d class in package p2.**

package p2;

import p1.two\_d;

public class three\_D extends two\_d {

private double z;

public three\_D(double a, double b, double c) {

super(a, b);

z = c;

}

public String toString() {

String s = super.toString();

return " "+s +" , "+ z;

}

}

**//make demo class in package p.**

package p;

import p2.three\_D;

import p1.\*;

public class demo\_Q2 {

public static void main(String a[]) {

two\_d d = new two\_d(23, 45);

System.out.println("Co-ordinates of 3-D plane : " + d.toString());

d = new three\_D(2, 4.5, 55.2);

System.out.println("Co-ordinates of 2-D plane : " + d.toString());

}

}

**Question Number --- 03**

3) Define an abstract class Shape in package P1. Inherit two more classes: Rectangle in package P2 and Circle in package P3. Write a program to ask the user for the type of shape and then using the concept of dynamic method dispatch, display the area of the

appropriate subclass. Also write appropriate methods to read the data. The main() function should not be in any package.

**Program**

**// make abstract class in package in p1**

package p1;

public abstract class shape {

public abstract void getdata();

public abstract double area();

public abstract void print();

}

**// make rectangle class extends shape class p2**

package p2;

import p1.\*;

import java.util.Scanner;

public class rectangle extends shape {

private double length;

private double breadth;

private double area;

public void getdata() {

Scanner sc = new Scanner(System.in);

System.out.print("Enter length = ");

length = sc.nextDouble();

System.out.print("Enter breadth : ");

breadth = sc.nextDouble();

}

public double area() {

area = length \* breadth;

return area;

}

public void print() {

area = length \* breadth;

System.out.println("Area of rectangle(" + length + " , " + breadth + ") = " + area);

}

}

**//make circle class exteds shape class in package p3**

package p3;

import p1.\*;

import java.util.Scanner;

import p2.\*;

public class circle extends shape {

private double radius;

private double area;

public circle() {

}

public circle(double a) {

radius = a;

}

public void getdata() {

Scanner sc = new Scanner(System.in);

System.out.println("Enter radius of the circle : ");

radius = sc.nextDouble();

}

public double area() {

area = 3.14 \* radius \* radius;

return area;

}

public void print() {

area = 3.14 \* radius \* radius;

System.out.println("Area of th circle(" + radius + ") = " + area);

}

}

**// import and run demo od package of p1,p2&p3 in //package project.**

package project;

import p1.\*;

import p2.\*;

import p3.\*;

import java.util.Scanner;

public class demo\_Q3 {

public static void main(String a[]) {

Scanner sc = new Scanner(System.in);

shape[] arr = new shape[10];

int i = 0;

int n = 1;

int ch;

while (n <= 5) {

System.out.print("1.Reactangle \n2.Circle\nEnter yor choice: ");

ch = sc.nextInt();

switch (ch) {

case 1:

arr[i] = new rectangle();

arr[i].getdata();

i++;

break;

case 2:

arr[i] = new circle();

arr[i].getdata();

i++;

break;

default:

System.out.println("\nInvalic choice !");

break;

}

if (n != 5) {

System.out.print("\n1. Want to continue. \n2. Quit. \nEnter your choice : ");

ch = sc.nextInt();

if (ch == 2) {

n = 5;

}

}

n++;

}

for (int j = 0; j < i; j++) {

arr[j].print();

System.out.println("");

}

}

}

**Question Number --- 04**

4) Create an exception subclass UnderAge, which prints “Under Age” along with the age value when an object of UnderAge class is printed in the catch statement. Write a class exceptionDemo in which the method test() throws UnderAge exception if the variable age passed to it as argument is less than 18. Write main() method also to show working of the program.

**Program**

import java.util.\*;

class UnderAge extends Exception{

private int age;

UnderAge(int a)

{

age=a;

}

}

public class ExceptionDemo {

static void test(int a) throws Exception

{

if(a<18)

throw new Exception("Your are Under Age 18");

else

System.out.println("You are adult with age: "+a);

}

public static void main(String[] args) {

Scanner sc = new Scanner(System.in);

System.out.println("Enter your age: ");

int a = sc.nextInt();

try{

test(a);

}

catch(Exception e)

{

System.out.println(e.getMessage());

}

}

}

**Question Number --- 05**

5) Write a program to implement stack. Use exception handling to manage underflow and overflow conditions.

**Program**

public class FixedStack extends Exception

{

private int stck [];

private int tos;

FixedStack (int size)

{

stck = new int [size];

tos = -1;

}

public void push(int item) throws Exception

{

if (tos==stck.length-1)

throw new Exception("Stack is overflow.");

else

{

stck [++tos] = item;

System.out.println(""+stck[tos]);

}

}

public int pop() throws Exception

{

if (tos < 0)

{

throw new Exception ("Stack underflow.");

}

else

System.out.println( stck [tos--]);

return 0;

}

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

FixedStack s = new FixedStack(5);

FixedStack d = new FixedStack(5);

try

{

for(int i=0; i<10; i++)

{

s.push(i);

}

}

catch(Exception e)

{

System.out.println(""+e.getMessage());

}

try

{

for(int i=0; i<10; i++)

{

System.out.println(d.pop());

}

}

catch(Exception e)

{

System.out.println(""+e.getMessage());

}

}

}

**Question Number --- 06**

6) Write a program that copies content of one file to another. Pass the names of the files

through command-line arguments.

**Program**

package IOPack;

import java.io.\*;

public class Main

{

public static void main(String args[]) throws FileNotFoundException, IOException

{

int i;

try(FileInputStream in = new FileInputStream("E:\\JAVA1\\a.txt");

FileOutputStream out = new FileOutputStream("E:\\JAVA1\\b.txt"))

{

do

{

i = in.read();

if(i!=-1)

out.write(i);

}while(i!=-1);

}

}

}

**Question Number --- 07**

1. Write a program to read a file and display only those lines that have the first two characters as '//' (Use try with resources).

**Program**

package IOPack;

import java.io.\*;

public class Main\_1

{

public static void main(String[] args)

{

try( FileReader fr = new FileReader(new File("E:\\JAVA PRACTICALS\\JavaProgram\\src\\IOPack\\deepak.txt")); )

{

BufferedReader br = new BufferedReader(fr);

StringBuffer sb = new StringBuffer();

String l;

while ((l = br.readLine()) != null)

{

if(l.charAt(0)=='/' && l.charAt(1)=='/')

{

sb.append(l);

sb.append("\n");

}

}

System.out.println("Contents of File:");

System.out.println(sb.toString());

}

catch (IOException e)

{

System.out.print(""+e.getMessage());

}

}

}

**Question Number --- 08**

8) Write a program to create a frame using AWT. Implement mouseClicked(), mouseEntered() and mouseExited() events such that:

a) Size of the frame should be tripled when mouse enters it.

b) Frame should reduce to its original size when mouse is clicked in it.

c) Close the frame when mouse exits it.

**Program**

package AWTpkg;

import java.awt.\*;

import java.awt.event.\*;

public class Mouse{

public static void main(String[] args)

{

new MyClickListener1();

}

}

class MyClickListener1 extends Frame implements MouseListener {

MyClickListener1()

{

setSize(200,200);

setVisible(true);

addMouseListener(this);

addWindowListener(new MyWindowListener());

}

public void mouseClicked(MouseEvent event)

{

System.out.println("Mouse Clicked");

setSize(200,200);

}

public void mousePressed(MouseEvent e)

{

System.out.println("Mouse Pressed");

}

public void mouseReleased(MouseEvent e)

{

System.out.println("Mouse Released");

}

public void mouseEntered(MouseEvent e)

{

System.out.println("Mouse Entered");

setSize(600,600);

}

public void mouseExited(MouseEvent e)

{

System.out.println("Mouse Exited");

System.exit(0);

}

}

class MyWindowListener1 extends WindowAdapter {

public void windowClosing(WindowEvent event) {

System.exit(0);

}

**Question Number --- 09**

9) Using AWT, write a program to display a string in frame window with pink color as background.

**Program**

import java.awt.\*;

import java.awt.event.WindowAdapter;

import java.awt.event.WindowEvent;

class AWT\_CDemo1 extends Frame {

AWT\_CDemo1() {

setSize(400, 400);

setLayout(new FlowLayout());

setVisible(true);

setBackground(Color.PINK);

//Adding Label

Label l = new Label("MyLabel1");

l.setText("This is AWT program with coloured Frame");

System.out.println(l.getText());

add(l);

}

public static void main(String[] args) {

AWT\_CDemo1 a = new AWT\_CDemo1();

a.addWindowListener(new MyWindowsAdapter());

class MyWindowsAdapter extends WindowAdapter{

public void windowClosing(WindowEvent we){

System.exit(0);

}

}

}

}

**Question Number --- 10**

1. Using AWT, write a program to create two buttons named “Red” and “Blue”. When a button is pressed the background color should be set to the color named by the button’s label.

**Program**

import java.awt.\*;

import java.awt.event.\*;

public class Awt\_Color1 extends Frame implements ActionListener {

Button b1;

Button b2;

Awt\_Color1()

{

setSize(400,400);

setLayout(new FlowLayout());

setTitle("Red Blue Buttons");

setVisible(true);

b1 = new Button("Red");

b1.addActionListener(this);

add(b1);

b2 = new Button("Blue");

b2.addActionListener(this);

add(b2);

addWindowListener(new WindowAdapter(){

public void windowClosing(WindowEvent e){

System.exit(0);

}

});

}

public static void main(String[] args) {

Awt\_Color1 aw = new Awt\_Color1();

}

public void actionPerformed(ActionEvent e)

{

if(e.getSource() == b1)

{

setBackground(Color.red);

b1.setForeground(Color.red);

b2.setForeground(Color.black);

b2.setBackground(Color.white);

}

else if(e.getSource()==b2)

{

setBackground(Color.blue);

b2.setForeground(Color.blue);

b1.setForeground(Color.black);

b1.setBackground(Color.white);

}

}

}

**Question Number --- 11**

11) Using AWT, write a program using appropriate adapter class to display the message (“Typed character is: *<typedCharacter>*”) in the frame window when user types any key.

**Program**

package SwingPkg;

import java.awt.\*;

import java.awt.event.\*;

import javax.swing.JTextField;

import javax.swing.event.CaretEvent;

import javax.swing.event.CaretListener;

public class char\_at1 extends Frame

{

JTextField b1;

Label b2,b3;

public char\_at1()

{

setLayout(new FlowLayout());

b1= new JTextField(" ");

b2 = new Label("Joy");

add(b2);

add(b1);

b1.addCaretListener(new CaretListener(){

public void caretUpdate(CaretEvent e)

{

b2.setText(b1.getText());

}

});

addWindowListener(new WindowAdapter()

{

public void windowClosing(WindowEvent we)

{

System.exit(0);

}

});

setSize(200,200);

setVisible(true);

setTitle("char\_at");

}

public static void main(String[] args)

{

char\_at1 a = new char\_at1();

}

}

**Question Number --- 12**

12) Using AWT, write a program to create two buttons labelled ‘A’ and ‘B’. When button ‘A’ is pressed, it displays your personal information (Name, Course, Roll No, College) and when button ‘B’ is pressed, it displays your CGPA in previous semester.

**Program**

import java.awt.\*;

import java.awt.event.\*;

import java.util.\*;

public class CGPA extends Frame implements ActionListener

{

Button b,c;

TextField tf,tf1,tf2,tf3,tf4;

Label l1,l2,l3,l4,l5;

CGPA()

{

setSize(400, 400);

setLayout(null);

tf = new TextField("Deepak Bhatia");

tf1 = new TextField("B.Sc (Hons.) Computer Science");

tf2 = new TextField("5803");

tf3 = new TextField("Keshav Mahavidyalaya");

tf4 = new TextField("9.18");

tf.setBounds(180, 100, 90, 20);

tf1.setBounds(180, 130, 140, 20);

tf2.setBounds(180, 160, 140, 20);

tf3.setBounds(180, 190, 130, 20);

tf4.setBounds(180, 190, 130, 20);

add(tf);

add(tf1);

add(tf2);

add(tf3);

add(tf4);

tf.setVisible(false);

tf1.setVisible(false);

tf2.setVisible(false);

tf3.setVisible(false);

tf4.setVisible(false);

l1 = new Label("Name");

l2 = new Label("Course");

l3 = new Label("Roll No.");

l4 = new Label("College");

l5 = new Label("CGPA");

l1.setBounds(20,100,90,20);

l2.setBounds(20, 130, 140, 20);

l3.setBounds(20, 160, 140, 20);

l4.setBounds(20, 190, 130, 20);

l5.setBounds(20, 190, 130, 20);

add(l1);

add(l2);

add(l3);

add(l4);

add(l5);

l1.setVisible(false);

l2.setVisible(false);

l3.setVisible(false);

l4.setVisible(false);

l5.setVisible(false);

b = new Button("Button : A");

b.setBounds(20, 60, 70, 30);

b.addActionListener(this);

add(b);

c = new Button("Button : B");

c.setBounds(220, 60, 70, 30);

add(c);

c.addActionListener(this);

addWindowListener(new WindowAdapter()

{

public void windowClosing(WindowEvent we)

{

System.exit(0);

}

});

setVisible(true);

}

public static void main(String args[])

{

CGPA a = new CGPA();

}

public void actionPerformed(ActionEvent e)

{

if(e.getSource()==b)

{

tf.setVisible(true);

tf1.setVisible(true);

tf2.setVisible(true);

tf3.setVisible(true);

tf4.setVisible(false);

l1.setVisible(true);

l2.setVisible(true);

l3.setVisible(true);

l4.setVisible(true);

l5.setVisible(false);

}

else if(e.getSource()==c)

{

tf.setVisible(false);

tf1.setVisible(false);

tf2.setVisible(false);

tf3.setVisible(false);

tf4.setVisible(true);

l1.setVisible(false);

l2.setVisible(false);

l3.setVisible(false);

l4.setVisible(false);

l5.setVisible(true);

}

}

}

**Question Number --- 13(a)**

13 a.) Write a program to create a frame using AWT. Implement mouseClicked(), mouseEntered() and mouseExited() events such that:

a) Size of the frame should be tripled when mouse enters it.

b) Frame should reduce to its original size when mouse is clicked in it.

c) Close the frame when mouse exits it.

**Program**

package AWTpkg;

import java.awt.\*;

import java.awt.event.\*;

import javax.swing.JFrame;

public class Mouse{

public static void main(String[] args)

{

new MyClickListener1();

}

}

class MyClickListener1 extends JFrame implements MouseListener {

MyClickListener1()

{

setSize(200,200);

setVisible(true);

addMouseListener(this);

addWindowListener(new MyWindowListener());

}

public void mouseClicked(MouseEvent event)

{

System.out.println("Mouse Clicked");

setSize(200,200);

}

public void mousePressed(MouseEvent e)

{

System.out.println("Mouse Pressed");

}

public void mouseReleased(MouseEvent e)

{

System.out.println("Mouse Released");

}

public void mouseEntered(MouseEvent e)

{

System.out.println("Mouse Entered");

setSize(600,600);

}

public void mouseExited(MouseEvent e)

{

System.out.println("Mouse Exited");

System.exit(0);

}

}

class MyWindowListener1 extends WindowAdapter {

public void windowClosing(WindowEvent event) {

System.exit(0);

}

}

**Question Number --- 13(b)**

13.b) Using AWT, write a program to display a string in frame window with pink color as background.

**Program**

import java.awt.\*;

import java.awt.Color;

import java.awt.event.WindowAdapter;

import java.awt.event.WindowEvent;

import javax.swing.JFrame;

import javax.swing.JPanel;

public class AWT\_CDemo1 extends JFrame {

JPanel j;

AWT\_CDemo1() {

j=new JPanel();

setSize(400, 400);

j.setLayout(new FlowLayout());

j.setBackground(Color.PINK);

//Adding Label

Label l = new Label("MyLabel1");

l.setText("This is Swing program with coloured Frame");

System.out.println(l.getText());

j.add(l);

add(j);

setVisible(true);

addWindowListener(new WindowAdapter()

{

public void windowClosing(WindowEvent we)

{

System.exit(0);

}

});

}

public static void main(String[] args) {

AWT\_CDemo1 a = new AWT\_CDemo1();

a.addWindowListener(new MyWindowsAdapter());

}

}

**Question Number --- 13(c)**

1. C) Using AWT, write a program to create two buttons named “Red” and “Blue”. When a button is pressed the background color should be set to the color named by the button’s label.

**Program**

package SwingPkg;

import java.awt.Color;

import java.awt.event.\*;

import javax.swing.\*;

class java\_10\_swing extends JFrame implements ActionListener

{

JButton b,c;

JPanel p1;

java\_10\_swing() {

setSize(400, 400);

setVisible(true);

p1 = new JPanel();

b = new JButton("Red");

b.addActionListener(this);

add(b);

c = new JButton("Blue");

add(c);

c.addActionListener(this);

add(p1);

b.setBounds(20, 60, 70, 40);

c.setBounds(120, 60, 70, 40);

setDefaultCloseOperation(JFrame.EXIT\_ON\_CLOSE);

}

public static void main(String args[])

{

java\_10\_swing a = new java\_10\_swing();

}

public void actionPerformed(ActionEvent e)

{

if(e.getSource()==b)

{

p1.setBackground(Color.red);

}

else if(e.getSource()==c)

{

p1.setBackground(Color.blue);

}

}

}

**Question Number --- 13(d)**

11) Using AWT, write a program using appropriate adapter class to display the message (“Typed character is: *<typedCharacter>*”) in the frame window when user types any key.

**Program**

package SwingPkg;

import java.awt.FlowLayout;

import java.awt.event.\*;

import javax.swing.\*;

import javax.swing.event.CaretEvent;

import javax.swing.event.CaretListener;

public class char\_at extends JFrame

{

JTextField b1;

JLabel b2,b3;

public char\_at()

{

setLayout(new FlowLayout());

b1= new JTextField(" ");

b2 = new JLabel("Joy");

add(b2);

add(b1);

b1.addCaretListener(new CaretListener(){

public void caretUpdate(CaretEvent e)

{

b2.setText(b1.getText());

}

});

setSize(200,200);

setVisible(true);

setTitle("char\_at");

setDefaultCloseOperation(JFrame.EXIT\_ON\_CLOSE);

}

public static void main(String[] args)

{

char\_at ms = new char\_at();

}

}

**Question Number --- 13(e)**

13.e) Using AWT, write a program to create two buttons labelled ‘A’ and ‘B’. When button ‘A’ is pressed, it displays your personal information (Name, Course, Roll No, College) and when button ‘B’ is pressed, it displays your CGPA in previous semester.

**Program**

import java.awt.\*;

import java.awt.event.\*;

import java.util.\*;

import javax.swing.\*;

public class CGPA extends JFrame implements ActionListener

{

JButton b,c;

JTextField tf,tf1,tf2,tf3,tf4;

JLabel l1,l2,l3,l4,l5;

CGPA()

{

setSize(400, 400);

setLayout(null);

tf = new JTextField("Deepak Bhatia");

tf1 = new JTextField("B.Sc (Hons.) Computer Science");

tf2 = new JTextField("5803");

tf3 = new JTextField("Keshav Mahavidyalaya");

tf4 = new JTextField("9.18");

tf.setBounds(180, 100, 90, 20);

tf1.setBounds(180, 130, 140, 20);

tf2.setBounds(180, 160, 140, 20);

tf3.setBounds(180, 190, 130, 20);

tf4.setBounds(180, 190, 130, 20);

add(tf);

add(tf1);

add(tf2);

add(tf3);

add(tf4);

tf.setVisible(false);

tf1.setVisible(false);

tf2.setVisible(false);

tf3.setVisible(false);

tf4.setVisible(false);

l1 = new JLabel("Name");

l2 = new JLabel("Course");

l3 = new JLabel("Roll No.");

l4 = new JLabel("College");

l5 = new JLabel("CGPA");

l1.setBounds(20,100,90,20);

l2.setBounds(20, 130, 140, 20);

l3.setBounds(20, 160, 140, 20);

l4.setBounds(20, 190, 130, 20);

l5.setBounds(20, 190, 130, 20);

add(l1);

add(l2);

add(l3);

add(l4);

add(l5);

l1.setVisible(false);

l2.setVisible(false);

l3.setVisible(false);

l4.setVisible(false);

l5.setVisible(false);

b = new JButton("Button : A");

b.setBounds(20, 60, 100, 30);

b.addActionListener(this);

add(b);

c = new JButton("Button : B");

c.setBounds(220, 60, 100, 30);

add(c);

c.addActionListener(this);

setDefaultCloseOperation(JFrame.EXIT\_ON\_CLOSE);

setVisible(true);

}

public static void main(String args[])

{

CGPA a = new CGPA();

}

public void actionPerformed(ActionEvent e)

{

if(e.getSource()==b)

{

tf.setVisible(true);

tf1.setVisible(true);

tf2.setVisible(true);

tf3.setVisible(true);

tf4.setVisible(false);

l1.setVisible(true);

l2.setVisible(true);

l3.setVisible(true);

l4.setVisible(true);

l5.setVisible(false);

}

else if(e.getSource()==c)

{

tf.setVisible(false);

tf1.setVisible(false);

tf2.setVisible(false);

tf3.setVisible(false);

tf4.setVisible(true);

l1.setVisible(false);

l2.setVisible(false);

l3.setVisible(false);

l4.setVisible(false);

l5.setVisible(true);

}

}

}

**Thank you**