

OBJECT ORIENTED PROGRAMMING THROUGH JAVA

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CSE 2

Week-6:

a) Create a multilevel inheritance for classes vehicle, brand and cost. The vehicle class determines the type of vehicle which is inherited by the class brand which determines the brand of the vehicle. Brand class is inherited by cost class, which tells about the cost of the vehicle. Create another class which calls the constructor of cost class and method that displays the total vehicle information from the attributes available in the super classes.

```
import java.util.*;

class Vehicle{
    String vehicle_name;
    Vehicle(String vehicle_name){
        this.vehicle_name=vehicle_name;
    }
}

class Brand extends Vehicle{
    String brand_name;
    Brand(String vehicle_name,String brand_name){
        super(vehicle_name);
        this.brand_name=brand_name;
    }
}

class Cost extends Brand{
    double price;
    Cost(String vehicle_name,String brand_name,double price){
        super(vehicle_name,brand_name);
        this.price=price;
    }
}
```

```

    }

    void displayInfo(){
        System.out.println("Vehicle :"+vehicle_name);
        System.out.println("Brand :"+brand_name);
        System.out.println("Cost :"+price);
    }
}

class week6a{
    public static void main(String[] args) {
        Scanner sc=new Scanner(System.in);
        System.out.print("Enter Vehicle type :");
        String vehicle_name=sc.nextLine();
        System.out.print("Enter brand name:");
        String brand_name=sc.nextLine();
        System.out.print("Enter cost of vehicle:");
        double price=sc.nextDouble();
        Cost c=new Cost(vehicle_name, brand_name, price);
        c.displayInfo();
        sc.close();
    }
}

```

Output:

```

PS D:\Learn\Programs\javalab> javac week6a.java
PS D:\Learn\Programs\javalab> java week6a
Enter Vehicle type :Car
Enter brand name:Tesla
Enter cost of vehicle:125500
Vehicle :Car
Brand :Tesla
Cost :125500.0
PS D:\Learn\Programs\javalab> 

```

b) Create an inheritance hierarchy of Figure_3D, Cylinder, Cone, Sphere etc. In the base class and provide methods that are common to all Figure_3Ds and override these in the derived classes to perform different behaviors, depending on the specific type of Figure_3D. Create an array of Figure_3D, fill it with different specific types of

Figure_3Ds and call your base class methods.

```
import java.util.*;

class Figure_3D{
    void area(){
    }
    void volume(){
    }
}

class Cylinder extends Figure_3D{
    double rarious;
    double height;
    Cylinder(double rarious,double height){
        super();
        this.rarious=rarious;
        this.height=height;
    }
    void area(){
        System.out.println("The area of cylinder is :"+(2*Math.PI*rarious*(rarious+height)));
    }
    void volume(){
        System.out.println("The volume of cylinder is :"+(Math.PI*rarious*rarious*height));
    }
}

class Cone extends Figure_3D{
    double rarious;
    double height;
    Cone(double rarious,double height){
        super();
        this.rarious=rarious;
        this.height=height;
    }
}
```

```

    }

    void area(){

        System.out.println("The area of cone is
: "+(Math.PI*radious*(radious+Math.sqrt((radious*radious+height*height)))));

    }

    void volume(){

        System.out.println("The volume of cone is : "+(Math.PI*radious*radious*height/3));

    }

}

class Sphere extends Figure_3D{

    double radious;

    Sphere(double radious){

        super();

        this.radious=radious;

    }

    void area(){

        System.out.println("The area of sphere is : "+(4*Math.PI*radious*radious));

    }

    void volume(){

        System.out.println("The volume of sphere is
: "+(4/3*Math.PI*radious*radious*radious));

    }

}

class week6b {

    public static void main(String[] args) {

        Scanner sc=new Scanner(System.in);

        Figure_3D f[]=new Figure_3D[3];

        System.out.println("Enter dimensions of Cylinder ");

        System.out.print("Height :");

        double height=sc.nextDouble();

        System.out.print("Radious :");

```

```

        double r=sc.nextDouble();

        f[0]=new Cylinder(r, height);

        f[0].area();

        f[0].volume();

        System.out.println("Enter dimensions of Cone ");

        System.out.print("Height :");

        height=sc.nextDouble();

        System.out.print("Radius :");

        r=sc.nextDouble();

        f[1]=new Cylinder(r, height);

        f[1].area();

        f[1].volume();

        System.out.println("Enter dimensions of Sphere ");

        System.out.print("Radius :");

        r=sc.nextDouble();

        f[2]=new Cylinder(r, height);

        f[2].area();

        f[2].volume();

        sc.close();

    }

}

```

Output:

```

PS D:\Learn\Programs\javalab> javac week6b.java
PS D:\Learn\Programs\javalab> java week6b
Enter dimensions of cylinder
Height :10
Radius :5
The area of cylinder is :471.23889803846896
The volume of cylinder is :785.3981633974483
Enter dimensions of Cone
Height :7
Radius :5
The area of cylinder is :376.99111843077515
The volume of cylinder is :549.7787143782139
Enter dimensions of Sphere
Radius :5
The area of cylinder is :376.99111843077515
The volume of cylinder is :549.7787143782139
PS D:\Learn\Programs\javalab> 

```

Week-7:

a) Design a package to contain the class Student that contains data members such as name, roll number and another package contains the interface Sports which contains some sports information. Import these two packages in a package called Report which process both Student and Sport and give the report.

```
package First;
```

```
public class Student {
```

```
    String rno="19131A05A0";
```

```
    String name="Mahesh";
```

```
    double cgpa=9.32;
```

```
    public void studentInfo(){
```

```
        System.out.println("Roll no. :"+rno);
```

```
        System.out.println("Name :"+name);
```

```
        System.out.println("cGPA :"+cgpa);
```

```
    }
```

```
}
```

```
package Second;
```

```
public interface Sports{
```

```
    void display();
```

```
}
```

```
package Last;
```

```
import First.*;
```

```
import Second.*;
```

```
class sports2 implements Sports{
```

```
    public void display(){
```

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

```
        System.out.println("Volley ball");
```

```

        System.out.println("Foot ball");
    }
}

class week7a{
    public static void main(String[] args) {
        sports2 s=new sports2();
        s.display();
        Student st=new Student();
        st.studentInfo();
    }
}

```

Output:

```

PS D:\Learn\Programs\javalab> javac -d . Student.java
PS D:\Learn\Programs\javalab> javac -d . Sports.java
PS D:\Learn\Programs\javalab> javac -d . week7a.java
PS D:\Learn\Programs\javalab> java Last.week7a
Cricket
Volley ball
Foot ball
Roll no. :19131A05A0
Name :Mahesh
cGPA :9.32
PS D:\Learn\Programs\javalab> 

```

b) Write a program that accepts values of different data types and convert them to corresponding wrapper classes and display using the vector

```

import java.util.Vector;

public class week7b {
    public static void main(String[] args) {
        int x=5;
        Integer i=Integer.valueOf(x);
        float y=1.01301f;
        Float f=Float.valueOf(y);
        double z=1.0349;
        Double d=Double.valueOf(z);
    }
}

```

```

char a='M';

Character c=Character.valueOf(a);

Vector <Object>v=new Vector<> ();

v.add(i);

v.add(f);

v.add(d);

v.add(c);

for(int k=0;k<v.size();k++){

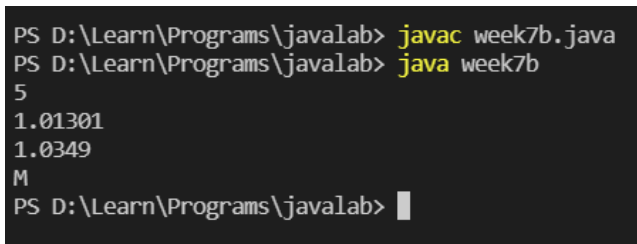
    System.out.println(v.get(k));

}

}

```

Output:



```

PS D:\Learn\Programs\java\lab> javac week7b.java
PS D:\Learn\Programs\java\lab> java week7b
5
1.01301
1.0349
M
PS D:\Learn\Programs\java\lab> 

```

Week-8:

a) Write a program to generate a set of random numbers between two numbers x1 and x2, and x1>0.

```
import java.util.*;
```

```

class week8a{

    public static void main(String[] args) {

        Scanner sc=new Scanner(System.in);

        System.out.print("Enter lower limit: ");

        int x1=sc.nextInt();

        System.out.print("Enter upper limit: ");
    }
}

```



```

int x2=sc.nextInt();

System.out.print("Enter no. of random numbers to be generated: ");

int n=sc.nextInt();

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

    System.out.print(x1+(int)(Math.random()*(x2-x1))+ " ");

}

sc.close();

}

}

```

Output:

```

PS D:\Learn\Programs\javalab> javac week8a.java
PS D:\Learn\Programs\javalab> java week8a
Enter lower limit: 10
Enter upper limit: 25
Enter no. of random numbers to be generated: 6
17 17 15 20 13 15
PS D:\Learn\Programs\javalab> █

```

b) Write a program to implement a new ArrayList class. It should contain add(), get(), remove(), size() methods. Use dynamic array logic.

```

import java.util.ArrayList;

class week8b {

    public static void main(String[] args) {

        ArrayList<String> arr = new ArrayList<String>();

        arr.add("Mahesh");

        arr.add("Uday");

        arr.add("Akshay");

        System.out.println(arr);

        System.out.println(arr.get(2));

        arr.remove(1);

        System.out.println(arr);

        System.out.println("Array Size:" + arr.size());

    }

}

```

```
}
```

Output:

```
PS D:\Learn\Programs\javalab> javac week8b.java
PS D:\Learn\Programs\javalab> java week8b
[Mahesh, Uday, Akshay]
Akshay
[Mahesh, Akshay]
Array Size:2
PS D:\Learn\Programs\javalab> █
```

c) Create an employee class containing at least 3 details along with Id, setters and getters. Insert the employee objects dynamically key as employee id and value as it's corresponding object into a HashMap. Perform Id based search operation on the HashMap.

```
import java.util.*;

class employee{
    int id;
    String name;
    double salary;
    void setId(int id){
        this.id=id;
    }
    void setName(String name){
        this.name=name;
    }
    void setSalary(Double salary){
        this.salary=salary;
    }
    int getId(){
        return id;
    }
    String getName(){
        return name;
    }
    Double getSalary(){
```

```

        return salary;
    }
}

class week8c {
    public static void main(String[] args) {
        Scanner sc=new Scanner(System.in);
        HashMap<Integer,employee> h=new HashMap<Integer,employee>();

        employee E1=new employee();
        E1.setId(101);
        E1.setName("Mahesh");
        E1.setSalary(556644.0);

        employee E2=new employee();
        E2.setId(102);
        E2.setName("Uday");
        E2.setSalary(523456.0);

        employee E3=new employee();
        E3.setId(103);
        E3.setName("Akshay");
        E3.setSalary(5421356.0);

        h.put(101, E1);
        h.put(102, E2);
        h.put(103, E3);

        for(int i:h.keySet()){
            System.out.println("ID: "+i+" Name: "+(h.get(i).getName())+" Salary:
            "+(h.get(i).getSalary()));
        }
    }
}

```

```

        sc.close();
    }
}

```

Output:

```

PS D:\Learn\Programs\javalab> javac week8c.java
PS D:\Learn\Programs\javalab> java week8c
ID: 101 Name: Mahesh Salary: 556644.0
ID: 102 Name: Uday Salary: 523456.0
ID: 103 Name: Akshay Salary: 5421356.0
PS D:\Learn\Programs\javalab> 

```

Week-9:

a) Write a program that reads file name from the user then displays information about that file, also read the contents from the file in byte stream to count number of alphabets, numeric values and special symbols. Write these statistics into another file using byte streams.

```

import java.io.*;
import java.util.*;

class week9a {

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

        Scanner sc=new Scanner(System.in);

        FileInputStream fi=null;

        FileOutputStream fo=null;

        int alphabets=0,numeric_values=0,spl_symbols=0;

        System.out.print("Enter a file name:");

        File f=new File(sc.next());

        try{

            fi=new FileInputStream(f);

            int c;

            while((c=fi.read())!=-1){

                char ch=(char)c;

                if((ch>='a'&&ch<='z')||(ch>='A'&&ch<='Z')){

```

```

        alphabets++;
    }
    else if(ch>='0'&&ch<='9'){
        numeric_values++;
    }
    else{
        if(ch!=' ' && ch!='\n' && ch!='\t' && ch!=13){
            spcl_symbols++;
        }
    }
}

fo=new FileOutputStream("Destination.txt");
String s="Alphabets: "+alphabets;
byte b[]=s.getBytes();
fo.write(b);

s="\nNumeric Values: "+numeric_values;
b=s.getBytes();
fo.write(b);

s="\nSpecial Symbols: "+spcl_symbols;
b=s.getBytes();
fo.write(b);
}

catch(IOException e){
    System.out.println(e);
}

finally{
    try{
        fo.close();
        fi.close();
    }
}

```

```

        catch(Exception e){
            System.out.println(e);
        }
    }
    sc.close();
}
}

```

Output:

```

PS D:\Learn\Programs\javalab> java week9a.java
Enter a file name:Source.txt
PS D:\Learn\Programs\javalab> 

```

Source.txt

```

1  1. @Java is oop language.
2  2. It robust.
3  3. Case sensitive Language.
4  4. Java is a wonderful language.

```

Destination.txt

```

javalab > Destination.txt
1  Alphabets: 70
2  Numeric Values: 4
3  Special Symbols: 9

```

b) Write a program that reads a CSV file containing a super market data containing product ID, Name, Cost and Quantity of sales and calculate the total revenue of the super market also sort the products in the order of their demand.

```

import java.io.*;

public class week9b {

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

        FileReader fi=null;

        int tot_cost=0;

        int Quantity[]=new int[3];

        String name[]=new String[3];

        try{

            fi=new FileReader("supermarket.csv");

            BufferedReader br=new BufferedReader(fi);

```

```

String temp="";
int i=0;
while((temp=br.readLine())!=null){
    String arr[]=temp.split(",");
    try{
        int x=Integer.parseInt(arr[2]);
        tot_cost+=x;

        int quan=Integer.parseInt(arr[3]);
        Quantity[i]=quan;
        name[i]=arr[1];
        i++;
    }
    catch(Exception e){
        System.out.println(e);
    }
}
br.close();
}
catch(IOException e){
    System.out.println(e);
}

for(int i=0;i<2;i++){
    for(int j=i+1;j<3;j++){
        if(Quantity[i]<Quantity[j]){
            int temp =Quantity[i];
            Quantity[i]=Quantity[j];
            Quantity[j]=temp;

```

```

        String str=name[i];
        name[i]=name[j];
        name[j]=str;
    }
}

System.out.println("The sorted list is:");
for(int i=0;i<3;i++){
    System.out.println(name[i]+" "+Quantity[i]);
}

System.out.println("Total revenue is "+tot_cost);
}
}

```

Output:

Supermarket.csv

```

javab > supermarket.csv
1 ID,Name,Cost,Quantity
2 1,Oranges,25,10
3 2,Apples,55,15
4 3,Kiwi,25,20

```

```

PS D:\Learn\Programs\javab> javac week9b.java
PS D:\Learn\Programs\javab> java week9b.java
The sorted list is:
Kiwi 20
Apples 15
Oranges 10
Total revenue is 105
PS D:\Learn\Programs\javab>

```

c) Write a program that reads a text file containing some technical content and identify the technical terms and sort them alphabetically. Note: use a file containing stop words (general English and Grammar terms as many terms as possible)

```

import java.io.*;
import java.util.*;

class week9c{
    public static void main(String args[]){
        String temp1=null,temp2=null;
        HashSet hs = new HashSet();
        int exists = 0;
    }
}

```



```

        BufferedReader brw = null;
        try{
            BufferedReader brt = new BufferedReader(new
FileReader("para.txt"));
            while((temp1=brt.readLine())!=null){
                String line[]=temp1.split(" ");
                for(int i=0;i<line.length;i++){
                    brw = new BufferedReader(new
FileReader("techterms.txt"));

                    while((temp2=brw.readLine())!=null){

                        if(temp2.trim().equalsIgnoreCase(line[i].trim())){
                            hs.add(line[i]);
                        }
                    }
                    brw.close();
                }
            }
            brt.close();
        }
        catch(Exception e){
            System.out.println("Error:"+e.getMessage());
        }
        System.out.println(hs);
    }
}

```

Output:

para.txt

```

javab > ≡ para.txt
1 The Arc Reactor was a device initially designed by Howard Stark, and later adapted by his son, Tony.
2 A massive arc reactor provided power for the sprawling complex of Stark Industries until its destruction,
3 and later the Stark Tower.
4 This design was miniaturized by Tony to power a life-saving electromagnet in his chest,
5 which had an energy output of 8 gigajoules per second. |

```

techterms.txt

Output:

```
javab > techterms.txt
1  reactor
2  device
3  vibranium
4  iron
5  armor
6  electro
7  magnet
8  gigajoules
9  magnitude
10 mobius
11 strip
```

```
PS D:\Learn\Programs\javab> java week9c
[armor, reactor, Iron, Reactor, device, gigajoules]
PS D:\Learn\Programs\javab>
```

Week-10:

a) Write a program that reads two numbers from the user to perform integer division into Num1 and Num2 variables. The division of Num1 and Num2 is displayed if they are integers. If Num1 or Num2 were not an integer, the program would throw a Number Format Exception. If Num2 were Zero, the program would throw an Arithmetic Exception.

```
class week10a{
    public static void main(String[] args) {
        try{
            int num1=Integer.parseInt(args[0]);
            int num2=Integer.parseInt(args[1]);
            int x=num1/num2;
            System.out.println("Division is: "+x);
        }
        catch(NumberFormatException e){
            System.out.println("Please Enter Integers only");
        }
        catch(ArithmeticException e){
            System.out.println("Can't be divided by zero ");
        }
    }
}
```

Output:

```

PS D:\Learn\Programs\javalab> javac week10a.java
PS D:\Learn\Programs\javalab> java week10a 10 5
Division is: 2
PS D:\Learn\Programs\javalab> java week10a 10 0
Can't be divided by zero
PS D:\Learn\Programs\javalab> java week10a 10 g
Please Enter Integers only
PS D:\Learn\Programs\javalab> 

```

b) Create a user defined exception.

```
import java.util.*;
```

```
class balanceException extends Exception{
```

```
    public String toString(){
```

```
        return "Insufficient Balance\nPlease check the amount you have entered and try again:");
```

```
    }
```

```
}
```

```
class week10b {
```

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

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

```
        System.out.println("The balance in your account is RS.1000");
```

```
        System.out.println("Enter the balance to withdraw:");
```

```
        int bal=sc.nextInt();
```

```
        sc.close();
```

```
        try{
```

```
            if(bal>1000){
```

```
                throw new balanceException();
```

```
            }
```

```
        else{
```

```
            System.out.println("Withdrawl SSuccessful");
```

```
            System.out.println("Reamaing balance in your account is:"+(1000-bal));
```

```
        }
```

```
    }
```

```
    catch (balanceException e) {
```

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

```
    }  
    }  
}
```

Output:

```
PS D:\Learn\Programs\javalab> javac week10b.java  
PS D:\Learn\Programs\javalab> java week10b  
The balance in your account is RS.1000  
Enter the balance to withdraw:  
1234  
Insufficient Balance  
Please check the amount you have entered and try again:)  
PS D:\Learn\Programs\javalab> 
```

Week-11:

a1) Write a program that creates 3 threads by extending the Thread class. First thread displays “Good Morning” every 1 sec, the second thread displays “Hello” every 2 seconds and the third displays Welcome” every 3 seconds.

```
class Thread1 extends Thread{  
    public void run(){  
        while(true){  
            try{  
                Thread.sleep(1000);  
            }  
            catch(Exception e){  
                System.out.println(e);  
            }  
            System.out.println("Good morning");  
        }  
    }  
}  
  
class Thread2 extends Thread{  
    public void run(){  
        while(true){  
            try{  
                Thread.sleep(2000);  
            }  
        }  
    }  
}
```

```

        catch(Exception e){
            System.out.println(e);
        }
        System.out.println("Hello");
    }
}

class Thread3 extends Thread{
    public void run(){
        while(true){
            try{
                Thread.sleep(3000);
            }
            catch(Exception e){
                System.out.println(e);
            }
            System.out.println("Welcome");
        }
    }
}

```

```

class week11a{
    public static void main(String[] args) {
        Thread1 t1=new Thread1();
        Thread2 t2=new Thread2();
        Thread3 t3=new Thread3();

        t1.start();
        t2.start();
        t3.start();
    }
}

```

```
}  
}
```

Output:

```
PS D:\Learn\Programs\javalab> javac week11a.java  
PS D:\Learn\Programs\javalab> java week11a  
Good morning  
Hello  
Good morning  
Welcome  
Good morning  
Hello  
Good morning  
Good morning  
Welcome  
Hello  
Good morning  
Good morning  
Hello  
Good morning  
Welcome  
Good morning
```

A2) Repeat the same by implementing Runnable

```
class Thread1r implements Runnable{  
    public void run(){  
        while(true){  
            try{  
                Thread.sleep(1000);  
            }  
            catch(Exception e){  
                System.out.println(e);  
            }  
            System.out.println("Good morning");  
        }  
    }  
}  
  
class Thread2r implements Runnable{  
    public void run(){  
        while(true){  
            try{  
                Thread.sleep(2000);  
            }  
        }  
    }  
}
```

```

        catch(Exception e){
            System.out.println(e);
        }
        System.out.println("Hello");
    }
}

class Thread3r implements Runnable{
    public void run(){
        while(true){
            try{
                Thread.sleep(3000);
            }
            catch(Exception e){
                System.out.println(e);
            }
            System.out.println("Welcome");
        }
    }
}

```

```

class week11ar{
    public static void main(String[] args) {
        Thread1r t1=new Thread1r();
        Thread2r t2=new Thread2r();
        Thread3r t3=new Thread3r();
        Thread t11=new Thread(t1);
        Thread t22=new Thread(t2);
        Thread t33=new Thread(t3);
        t11.start();
    }
}

```

```

        t22.start();

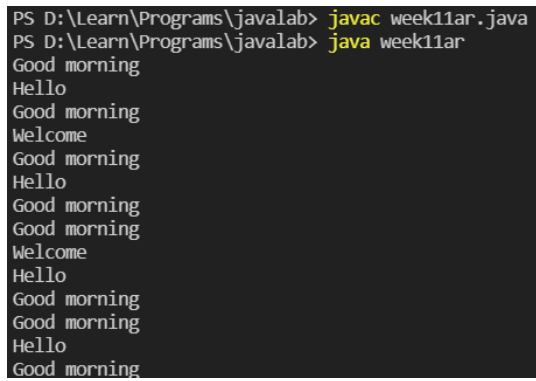
        t33.start();

    }

}

```

Output:



```

PS D:\Learn\Programs\javalab> javac week11ar.java
PS D:\Learn\Programs\javalab> java week11ar
Good morning
Hello
Good morning
Welcome
Good morning
Hello
Good morning
Good morning
Welcome
Hello
Good morning
Good morning
Hello
Good morning

```

b) Write a program to illustrate Thread synchronization.

```

class sync{

    synchronized void print(int n){

        for(int i=1;i<=5;i++){

            System.out.println(n+" * "+i+" = "+n*i);

            try{

                Thread.sleep(500);

            }

            catch(Exception e){

                System.out.println(e);

            }

        }

    }

}

class Thread1 extends Thread{

    sync d;

    Thread1(sync d){

        this.d=d;

    }

}

```



```

    public void run(){
        d.print(10);
    }
}

class Thread2 extends Thread{
    sync d;
    Thread2(sync d){
        this.d=d;
    }
    public void run(){
        d.print(12);
    }
}

class week11b{
    public static void main(String[] args) throws InterruptedException {
        sync d=new sync();
        Thread1 t1=new Thread1(d);
        Thread2 t2=new Thread2(d);
        t1.start();
        t2.start();

    }
}

```

Output:

```

PS D:\Learn\Programs\java1ab> javac week11b.java
PS D:\Learn\Programs\java1ab> java week11b
10 * 1 = 10
10 * 2 = 20
10 * 3 = 30
10 * 4 = 40
10 * 5 = 50
12 * 1 = 12
12 * 2 = 24
12 * 3 = 36
12 * 4 = 48
12 * 5 = 60
PS D:\Learn\Programs\java1ab>

```

Week-12

a) Create a JApplet that displays a message which is scrolling from left to right and vice versa

```
import javax.swing.*;
import java.awt.*;

/*<applet code="week12a.java" width=400 height=400> </applet>*/

public class week12a extends JApplet implements Runnable
{
    String msg="Hello everyone! Good morning.";
    int x = 0, y = 200;
    boolean flag = false;
    Thread t = null;
    public void init()
    {
        t = new Thread(this);
        t.start();
    }
    public void run()
    {
        while(true){
            if(x == 220)    flag = true;
            else if(x == 0) flag = false;
            if(flag) {
                x -= 1;
            } else {
                x += 1;
            }
            repaint();
            try {
                Thread.sleep(30);
            }
        }
    }
}
```

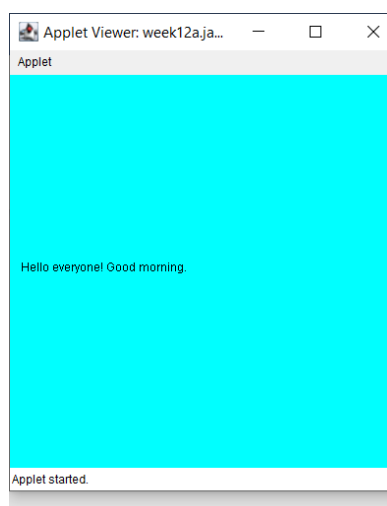
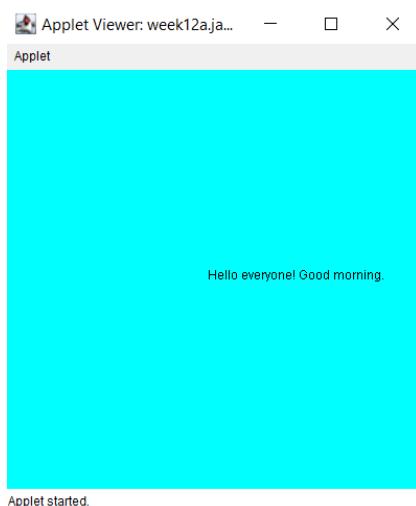
```

        } catch (InterruptedException e) {
            e.printStackTrace();
        }
    }
}

public void paint(Graphics g){
    g.setColor(Color.cyan);
    g.fillRect(0, 0, 400, 400);
    g.setColor(Color.black);
    g.drawString(msg, x, y);
}
}

```

Output:



b) Write a program that displays a sample registration page using Swing controls use appropriate layout managers.

```
import javax.swing.*;
```

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

```
class week12b{
```

```
    JFrame j=new JFrame("Sample resgistration page");
```

```
    week12b(){
```

```
        JLabel nam=new JLabel(" Name      ");
```

```
TextField name=new TextField(12);
```

```
JLabel unam=new JLabel(" User name");
```

```
TextField uname=new TextField(12);
```

```
JLabel pass=new JLabel(" Password ");
```

```
JPasswordField pwd=new JPasswordField(12);
```

```
ButtonGroup b=new ButtonGroup();
```

```
JRadioButton male=new JRadioButton("Male");
```

```
JRadioButton female=new JRadioButton("Female");
```

```
b.add(male);
```

```
b.add(female);
```

```
JCheckBox cb=new JCheckBox("I Agree Terms and conditions");
```

```
JLabel d=new JLabel();
```

```
JButton res=new JButton("Register");
```

```
j.add(nam);
```

```
j.add(name);
```

```
j.add(unam);
```

```
j.add(uname);
```

```
j.add(pass);
```

```
j.add(pwd);
```

```
j.add(male);
```

```
j.add(female);
```

```
j.add(cb);
```

```
j.add(d);
```

```
j.add(res);
```

```
j.setLayout(new GridLayout(7,2));
```

```
j.setSize(400, 200);
```

```
j.setVisible(true);
```

```

        j.setDefaultCloseOperation(JFrame.EXIT_ON_CLOSE);
    }

    public static void main(String[] args) {
        new week12b();
    }
}

```

Output:

c) Write a program for handling mouse events with adapter classes.

```

import java.awt.*;
import java.awt.event.*;
import javax.swing.*;

public class week12c extends MouseMotionAdapter {
    JFrame f;

    week12c() {
        f = new JFrame("Mouse Adapter");
        f.addMouseMotionListener(new MouseAdapter() {
            public void mouseDragged(MouseEvent e) {
                Graphics g = f.getGraphics();
                g.setColor(Color.blue);
                g.fillOval(e.getX(), e.getY(), 10, 10);
            }
        });

        f.setSize(300, 300);
        f.setLayout(null);
    }
}

```

```

        f.setVisible(true);

        f.setDefaultCloseOperation(JFrame.EXIT_ON_CLOSE);
    }

    public static void main(String[] args) {
        new week12c();
    }
}

```

Output:



Week-13:

a) Create an interface containing 3 radio buttons named line, rectangle and oval. Based on the radio button selected, allow user to draw lines, rectangles or ovals as per the locations selected by the user.

```

import javax.swing.*;
import java.awt.event.*;
import java.awt.*;

public class week13a extends MouseMotionAdapter implements ItemListener {
    JFrame f;
    ButtonGroup group;
    JRadioButton jrb1, jrb2, jrb3;
    JLabel jl;
    String msg = "";
    int x, y, x1, y1;
    int flag = 0;
}

```

```

week13a() {
    f = new JFrame();
    group = new ButtonGroup();
    jrb1 = new JRadioButton("Line");
    jrb2 = new JRadioButton("Rectangle");
    jrb3 = new JRadioButton("Oval");
    group.add(jrb1);
    group.add(jrb2);
    group.add(jrb3);
    jrb1.addItemListener(this);
    jrb2.addItemListener(this);
    jrb3.addItemListener(this);
    f.add(jrb1); f.add(jrb2); f.add(jrb3);
    jl = new JLabel();
    f.add(jl);
    f.addMouseListener(new MouseAdapter() {
        public void mouseClicked(MouseEvent e) {
            x = e.getX(); y = e.getY();
            Graphics g = f.getGraphics();
            if(flag == 1) {
                g.drawLine(x, y, 250, 250);
            } else if(flag == 2) {
                g.drawRect(x, y, 50, 100);
            } else if(flag == 3) {
                g.drawOval(x, y, 150, 200);
            }
        }
    });
    f.addMouseMotionListener(new MouseAdapter() {
        public void mouseMoved(MouseEvent e) {

```

```

        x1 = e.getX();
        y1 = e.getY();
        jl.setText("Mouse currently at x: " + x1 + " & y: " + y1);
    }
});

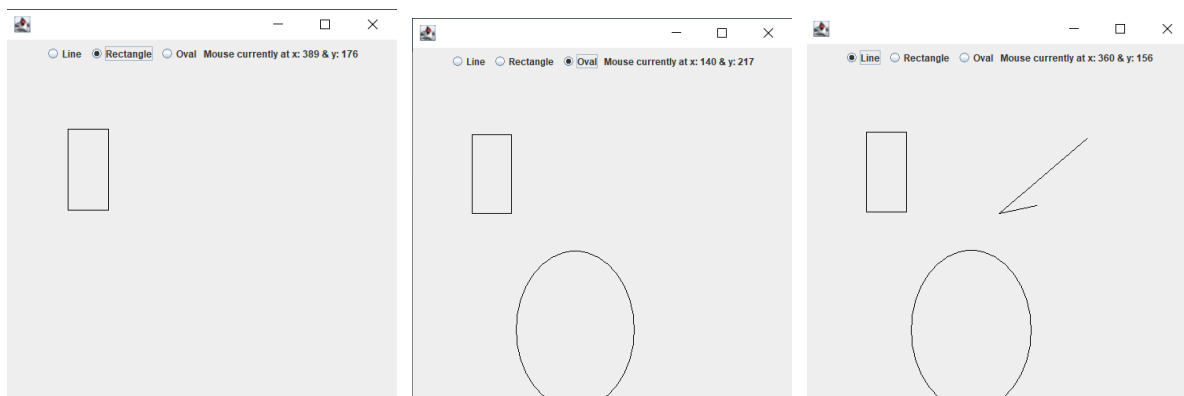
f.setLayout(new FlowLayout(FlowLayout.CENTER));
f.setVisible(true);
f.setSize(500, 500);
f.setDefaultCloseOperation(JFrame.EXIT_ON_CLOSE);
}

public void itemStateChanged(ItemEvent e) {
    if(e.getSource() == jrb1) {
        flag = 1;
    } else if(e.getSource() == jrb2) {
        flag = 2;
    } else if(e.getSource() == jrb3) {
        flag = 3;
    }
}

public static void main(String[] args) {
    new week13a();
}
}

```

Output:

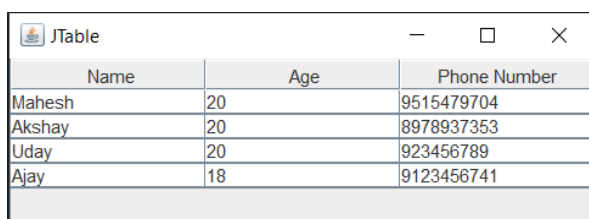


b) Write a program to create a Table inside a JFrame.

```
import javax.swing.*;
```

```
public class week13b {  
    JFrame j;  
    JTable t;  
    week13b(){  
        j=new JFrame("JTable");  
        String col_names[]={ "Name","Age","Phone Number"};  
        String  
data[][]={{ "Mahesh","20","9515479704"}, {"Akshay","20","8978937353"}, {"Uday","20","9  
23456789"},  
            {"Ajay","18","9123456741"} };  
        t=new JTable(data,col_names);  
        t.setBounds(40,40,50,50);  
        j.add(t);  
        JScrollPane sp = new JScrollPane(t);  
        j.add(sp);  
        j.setSize(400,400);  
        j.setDefaultCloseOperation(JFrame.EXIT_ON_CLOSE);  
        j.setVisible(true);  
    }  
    public static void main(String[] args) {  
        new week13b();  
    }  
}
```

Output:



Name	Age	Phone Number
Mahesh	20	9515479704
Akshay	20	8978937353
Uday	20	923456789
Ajay	18	9123456741

c) Create an interface that illustrates JFileChooser class and read CSV file containing employee data of various departments and display the records department wise on the interface.

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

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

```
import javax.swing.*;
```

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

```
public class week13c implements ActionListener,ItemListener {
```

```
    JFrame j;
```

```
    JFileChooser jf;
```

```
    JButton b1,b2,b3;
```

```
    JTextField jt;
```

```
    JComboBox jc;
```

```
    JTextArea jj;
```

```
    week13c(){
```

```
        j=new JFrame("File chooser");
```

```
        jf=new JFileChooser();
```

```
        b1=new JButton("Browse");
```

```
        b2=new JButton("Upload");
```

```
        b3=new JButton("Submit");
```

```
        jt=new JTextField(20);
```

```
        jc=new JComboBox();
```

```
        jj=new JTextArea(10,50);
```

```
        j.add(jt);
```

```
        j.add(b1);
```

```
        j.add(b2);
```

```
        j.add(jc);
```

```
        j.add(b3);
```

```

j.add(jj);
b1.addActionListener(this);
b2.addActionListener(this);
b3.addActionListener(this);
jc.addItemListener(this);
j.setLayout(new FlowLayout(FlowLayout.CENTER));
j.setVisible(true);
j.setSize(600,400);
j.setDefaultCloseOperation(JFrame.EXIT_ON_CLOSE);
}

public void actionPerformed(ActionEvent e) {
    if(e.getSource()==b1){
        int retval = jf.showOpenDialog(j);
        if(retval==JFileChooser.APPROVE_OPTION)
        {
            String file = jf.getSelectedFile().getAbsolutePath();
            jt.setText(file);
        }
    }
    if(e.getSource()==b2){
        String txt=jt.getText();
        if(txt.equals("")){
            JOptionPane.showMessageDialog(j, "select proper file");
        }
        else{
            try {
                FileReader fr=new FileReader(txt);
                BufferedReader br=new BufferedReader(fr);
                String temp="";
                while((temp=br.readLine())!=null){

```

```

        String row[]=temp.split(",");
        jc.addItem(row[2]);
    }

    fr.close();
    br.close();
}

catch (FileNotFoundException e1) {
    e1.printStackTrace();
}

catch (IOException e1) {
    e1.printStackTrace();
}
}

}

if(e.getSource()==b3){
    String txt=jt.getText();
    String query=(String) jc.getSelectedItem();
    if(txt.equals("")){
        JOptionPane.showMessageDialog(j, "select proper file");
    }
    else{
        try {
            FileReader fr=new FileReader(txt);
            BufferedReader br=new BufferedReader(fr);
            String temp="";
            while((temp=br.readLine())!=null){
                String row[]=temp.split(",");
                if(row[2].equals(query)){
                    temp.replace(",", " ");
                }
            }
        }
        catch (FileNotFoundException e1) {
            e1.printStackTrace();
        }
        catch (IOException e1) {
            e1.printStackTrace();
        }
    }
}
}

```

```

        jj.setText(jj.getText()+"\n"+temp);
    }
}
fr.close();
br.close();
}
catch (FileNotFoundException e1) {
    e1.printStackTrace();
}
catch (IOException e1) {
    e1.printStackTrace();
}
}
}
}

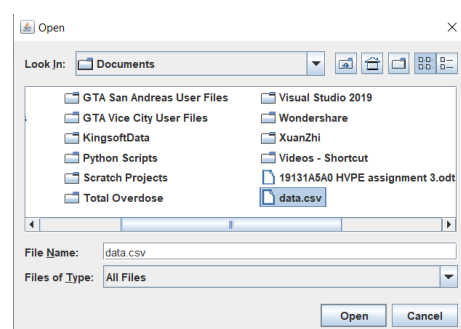
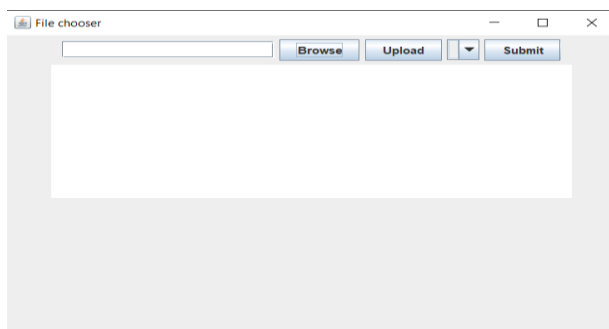
public void itemStateChanged(ItemEvent e) {
    jj.setText("");

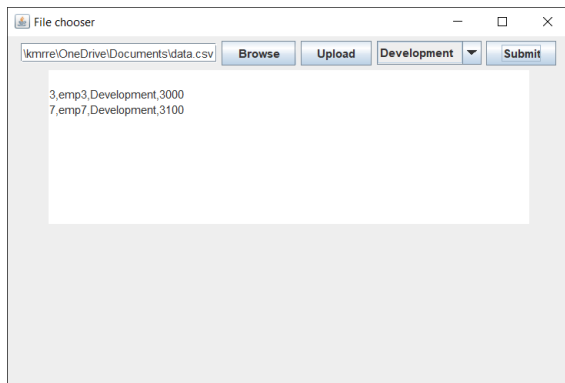
}

public static void main(String[] args) {
    new week13c();
}
}

```

Output:





Week-14:

a) For program 12) b) check all the fields filled or not, display success dialogue if all fields are filled with the help of ActionListener. Display respective error dialogue if a field is empty.

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

public class week14a implements ActionListener{

    JFrame j=new JFrame("Sample resgistration page");

    JTextField name,uname;

    JPasswordField pwd;

    JCheckBox cb;

    week14a(){

        JLabel nam=new JLabel(" Name      ");

        name=new JTextField(12);

        JLabel unam=new JLabel(" User name");

        uname=new JTextField(12);

        JLabel pass=new JLabel(" Password ");

        pwd=new JPasswordField(12);

        ButtonGroup b=new ButtonGroup();

        JRadioButton male=new JRadioButton("Male");

        JRadioButton female=new JRadioButton("Female");

        b.add(male);
```

```

b.add(female);

cb=new JCheckBox("I Agree Terms and conditions");
JLabel d=new JLabel();
JButton res=new JButton("Register");
j.add(nam);
j.add(name);
j.add(unam);
j.add(uname);
j.add(pass);
j.add(pwd);
j.add(male);
j.add(female);
j.add(cb);
j.add(d);
j.add(res);
res.addActionListener(this);
// j.setLayout(new FlowLayout(FlowLayout.LEFT));
j.setLayout(new GridLayout(7,2));
System.out.println(uname.getText());
// j.setSize(210,220);
j.setSize(400, 200);
j.setVisible(true);
j.setDefaultCloseOperation(JFrame.EXIT_ON_CLOSE);
}

public void actionPerformed(ActionEvent e) {
    boolean b=true;
    if(uname.getText().equals("")){
        JOptionPane.showMessageDialog(j,"Username Field is empty");
        b=false;
    }
}

```

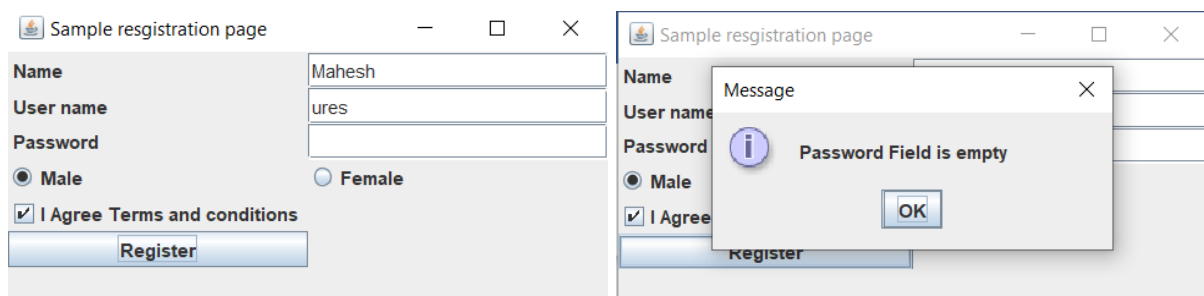
```

    }
    if(name.getText().equals("")){
        JOptionPane.showMessageDialog(j,"Name Field is empty");
        b=false;
    }
    if(pwd.getText().equals("")){
        JOptionPane.showMessageDialog(j,"Password Field is empty");
        b=false;
    }
    if(b==true){
        JOptionPane.showMessageDialog(j, "Resgistrastion Succesful with Username
"+uname.getText());
    }
}

public static void main(String[] args) {
    new week14a();
}
}

```

Output:



b) Write a program to create three JSliders where each represents colors RED, GREEN and BLUE. Each slider has a value from 0 to 255. The background color of the applet is set based on the values retrieved from each slider to form a color using the color class constructor. On sliding any slider, the background color of applet changes.

```

import java.awt.*;
import javax.swing.*;
import javax.swing.event.*;

```



```
public class week14b implements ChangeListener{

    JFrame j;

    JSlider js1,js2,js3;

    week14b(){

        j=new JFrame("Slider");

        js1=new JSlider(0,255);
        j.add(js1);
        js1.setMinorTickSpacing(10);
        js1.setMajorTickSpacing(50);
        js1.setPaintTicks(true);
        js1.setPaintLabels(true);
        js1.addChangeListener(this);

        js2=new JSlider(0,255);
        j.add(js2);
        js2.setMinorTickSpacing(10);
        js2.setMajorTickSpacing(50);
        js2.setPaintTicks(true);
        js2.setPaintLabels(true);
        js2.addChangeListener(this);

        js3=new JSlider(0,255);
        j.add(js3);
        js3.setMinorTickSpacing(10);
        js3.setMajorTickSpacing(50);
        js3.setPaintTicks(true);
        js3.setPaintLabels(true);
        js3.addChangeListener(this);

    }

}
```

```

        j.setLayout(new GridLayout(3,1));
        j.setVisible(true);
        j.setSize(400,200);
        j.setDefaultCloseOperation(JFrame.EXIT_ON_CLOSE);
    }

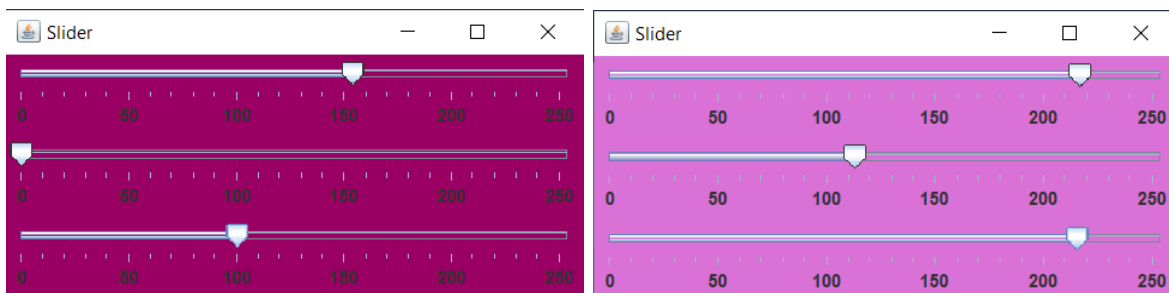
    public static void main(String[] args) {
        new week14b();
    }

    public void stateChanged(ChangeEvent e) {
        int value1=js1.getValue();
        int value2=js2.getValue();
        int value3=js3.getValue();

        js1.setBackground(new Color(value1,value2,value3));
        js2.setBackground(new Color(value1,value2,value3));
        js3.setBackground(new Color(value1,value2,value3));
    }
}

```

Output:



Week-15:

Write a program that implements a simple client/server application. The client sends data to a server. The server receives the data, uses it to produce a result, and then sends the result back to the client. The client displays the result on the console. For ex: The data sent from the client is the radius of a circle, and the result produced by the server is the area of the circle.

Server Program:

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

public class week15s {

    public static void main(String[] args) {

        try{

            ServerSocket ss=new ServerSocket(1309);

            System.out.println("Server Started");

            System.out.println("Waiting for client");

            Socket s=ss.accept();

            System.out.println("Connected to a client");

            DataInputStream ds=new DataInputStream(s.getInputStream());

            DataOutputStream dout=new DataOutputStream(s.getOutputStream());

            String str="";

            while(!str.equals("-1")){

                str=(String)ds.readUTF();

                try{

                    double d=Double.parseDouble(str);

                    if(d>=0){

                        double area=Math.PI*d*d;

                        String ar=Double.toString(area);

                        dout.writeUTF(ar);

                        dout.flush();

                    }

                    else{

                        dout.writeUTF("Thank you :)");

                        dout.flush();

                    }

                }

            }

            catch(NumberFormatException e){

                System.out.println("Enter a number");

            }

        }

    }

}
```

```

        }
        System.out.println(str);
    }
    dout.close();
    ss.close();
}
catch(Exception e){
    System.out.println(e);
}
}
}

```

Client program:

```

import java.io.*;
import java.net.*;
import java.util.*;
public class week15c {
    public static void main(String[] args) {
        try{
            Socket s=new Socket("localhost",1309);
            System.out.println("Connected to server!");
            DataOutputStream dout=new DataOutputStream(s.getOutputStream());
            DataInputStream din=new DataInputStream(s.getInputStream());
            Scanner sc=new Scanner(System.in);
            String str="";
            while(!str.equals("-1")){
                str=sc.nextLine();
                dout.writeUTF(str);
                dout.flush();
                String res=(String)din.readUTF();
            }
        }
    }
}

```

```

    try{
        Double.parseDouble(res);
        System.out.println("Area of circle with radius "+str+" is "+res);
    }
    catch(NumberFormatException e){
        System.out.println(res);
    }
}
sc.close();
dout.close();
s.close();
}
catch(Exception e){
    System.out.println(e);
}
}
}
}

```

Output:

```

PS D:\Learn\Programs\javalab> java week15s.java
Server Started
Waiting for client
Connected to a client
5
6
7
12
-1
PS D:\Learn\Programs\javalab> 

```

```

PS D:\Learn\Programs\javalab> java week15c.java
Connected to server!
5
Area of circle with radius 5 is 78.53981633974483
6
Area of circle with radius 6 is 113.09733552923255
7
Area of circle with radius 7 is 153.93804002589985
12
Area of circle with radius 12 is 452.3893421169302
-1
Thank you :)
PS D:\Learn\Programs\javalab> 

```
