Q1. Write a Java program that defines a class Student with instance variables for name, age, and a static variable for the number of students. Implement a non-static method to display student information and a static method to display the total number of students.

**package** project1;

**public** **class** Students {

**private** String name;

**private** **int** age;

**private** **static** **int** *totalStu*;

**static** **void** total() {

*totalStu* = 35;

}

**public** **void** stuInf() {

name = "Shravani";

age = 20;

System.***out***.println(name+" "+age+" "+*totalStu*);

}

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

Students.*total*();

Students s1 = **new** Students();

s1.stuInf();

}

}

Q2. Create a Java program to calculate the factorial of a number using a static method. The method should take an integer as a parameter and return its factorial.

**package** project1;

**public** **class** FactM {

**static** **int** fact(**int** n) {

**if**(n==1) {

**return** n;

}

**else** {

**int** facts=1;

**for**(**int** i=2;i<=n;i++) {

facts\*=i;

}

**return** facts;

}

}

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

**int** result = FactM.*fact*(5);

System.***out***.println(result);

}

}

Q3. Implement a Java class Calculator with static methods for addition, subtraction, multiplication, and division. Write a program to use these static methods to perform basic arithmetic operations.

**package** project1;

**public** **class** Calculator {

**static** **int** addition(**int** a, **int** b) {

**return** a+b;

}

**static** **int** subtraction(**int** a,**int** b) {

**return** a-b;

}

**static** **int** multiplication(**int** a, **int** b) {

**return** a\*b;

}

**static** **int** division(**int** a, **int** b) {

**return** a/b;

}

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

System.***out***.println(Calculator.*addition*(24, 30));

System.***out***.println(Calculator.*subtraction*(242, 329));

System.***out***.println(Calculator.*addition*(56, 5));

System.***out***.println(Calculator.*addition*(24, 6));

}

}

Q4. Define a class BankAccount with instance variables for account number and balance, and non-static methods for deposit and withdrawal. Implement a static method to calculate the total balance of all accounts.

**package** project1;

**public** **class** BankAccount {

**int** accountNum;

**double** balance;

**static** **double** *initBal*;

**static** **double** *totalBal*;

BankAccount(){

accountNum = 100;

balance = 1000;

}

**public** **void** deposit(**double** a) {

balance+=a;

*totalBal*=balance;

}

**public** **void** withdrawal(**double** a) {

balance-=a;

*totalBal*=balance;

}

**static** **void** initialize() {

*initBal* = 1000;

}

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

BankAccount.*initialize*();

BankAccount b1 = **new** BankAccount();

b1.deposit(100);

b1.withdrawal(300);

System.***out***.println(BankAccount.*totalBal*);

}

}

Q5. Write a Java program to create a class MathOperations with static methods to find the maximum and minimum of an array of integers.

**package** project1;

**public** **class** MathOper {

**static** **void** maxmin() {

**int**[]arr = {3,8,4,7,1,8,5};

**int** min=arr[0];

**int** max=arr[0];

**for**(**int** i=1;i<7;i++) {

**if**(arr[i]<min) {

min=arr[i];

}

**else** {

**if**(arr[i]>max) {

max=arr[i];

}

}

}

System.***out***.println(min);

System.***out***.println(max);

}

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

MathOper.*maxmin*();

}

}

Q6. Create a class Person with instance variables for name and age. Write a static method that takes an array of Person objects and returns the average age of all persons in the array.

**package** project1;

**public** **class** PersonM {

String name;

**int** age;

**static** **void** display() {

**double** result=0;

**double** avg=1;

**int**[] arr = {23,45,87,66,43,71};

**for**(**int** i=0;i<arr.length;i++) {

result+=arr[i];

avg=result/arr.length;

}

System.***out***.println("The average age of given persons is: "+avg);

}

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

PersonM.*display*();

}

}

Q7. Implement a Java class Circle with an instance variable for radius and non-static methods to calculate the area and circumference of a circle. Write a program to demonstrate the usage of these methods.

**package** project1;

**public** **class** CircleM {

**double** radius;

**public** **void** area(**double** radius) {

**double** cirArea = Math.***PI***\*radius\*radius;

System.***out***.println("The Area of circle"+cirArea);

}

**public** **void** circum(**double** radius) {

**double** cirCircum = 2 \* Math.***PI***\*radius ;

System.***out***.println("The circumference of circle"+cirCircum);

}

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

CircleM c1 = **new** CircleM();

c1.area(7);

c1.circum(7);

}

}

Q8. Create a class Employee with instance variables for name, salary, and a static variable for the total number of employees. Implement non-static methods for salary increment and a static method to display the total number of employees.

**package** project1;

**public** **class** EmployeeM {

String name;

**double** salary;

**static** **int** *totalEmp*;

**public** **void** salaryInc(**double** salary) {

**double** incSal=2000;

salary+=incSal;

System.***out***.println("The total salary after increment: "+salary);

}

**static** **void** display(**int** totalEmp) {

System.***out***.println("The total number of employess is: "+totalEmp);

}

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

EmployeeM.*display*(55);

EmployeeM e1 = **new** EmployeeM();

e1.salaryInc(2566);

}

}

Q9. Define a class StringManipulator with a static method that takes a string and returns the count of vowels in the string.

**package** project1;

**public** **class** StringMan {

**static** **void** vowels() {

String str = "SANJAY";

str=str.toLowerCase();

**int** result=0;

**for**(**char** ch : str.toCharArray()) {

**if**(ch=='a' || ch=='e' || ch=='i' || ch=='o' || ch=='u') {

result++;

}

}

System.***out***.println(result);

}

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

StringMan.*vowels*();

}

}

Q10. Write a Java program to create a class TemperatureConverter with static methods for converting Celsius to Fahrenheit and vice versa. Implement a program to convert temperatures using these methods.

**package** project1;

**public** **class** TempConM {

**double** cel;

**double** fah;

**static** **void** celFah(**double** cel) {

**double** res1 = (cel\*9/5)+32;

System.***out***.println(cel+" celsius = "+res1+" fahrenheit");

}

**static** **void** fahCel(**double** fah) {

**double** res2 = (fah-32)\*5/9;

System.***out***.println(fah+" fahrenheit = "+res2+" celsius");

}

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

TempConM.*celFah*(36);

TempConM.*fahCel*(53);

}

}