**Test 2 key**

**Object Oriented Programming (15 CS 2002)**

**For the A.Y. 2016-17- II sem(ECE/EEE/PE)**

**Basically programs are logic oriented, please verify whether concept to be used in the given question is followed by the student is primary objective for evaluation**.

**Note: Points to be tested for every question is mentioned with key.**

Q.no 1(a) Write a java program to demonstrate nested classes

1. student has to take minimum two classes, as they are nested classes.

2. demonstration required inner class in outer class and so on.

 class Outer

{ // open

 int outer\_x =100;

 void test()

 {

 Inner inr = new Inner();

 inr.display();

 System.out.println("from outer: p value ="+ inr.p);

 }

 class Inner

 {

 int p=25;

 void display()

 {

 System.out.println("display: outer\_x=" + outer\_x);

 System.out.println("from inner: p value ="+ p);

 }

 }// inner close

}// outer close

class InnerClassDemo

{

 public static void main(String args[])

 {

 Outer otr = new Outer();

 otr.test();

 System.out.println(" outer var="+ otr.outer\_x);

 }

}

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1b) Develop a java program to demonstrate nested classes that they have one instance variable each and one instance method each. Explain the accessibility.

1. Should write two classes minimum
2. One class should be inner class
3. Each class should have atleast one variable, one method.
4. Methods and variables must be accessed in the deminstration

class Outer

{ // open

 int outer\_x =100;

 void test()

 {

 Inner inr = new Inner();

 inr.display();

 System.out.println("from outer: p value ="+ inr.p);

 }

 class Inner

 {

 int p=25;

 void display()

 {

 System.out.println("display: outer\_x=" + outer\_x);

 System.out.println("from inner: p value ="+ p);

 }

 }// inner close

}// outer close

class InnerClassDemo

{

 public static void main(String args[])

 {

 Outer otr = new Outer();

 otr.test();

 System.out.println(" outer var="+ otr.outer\_x);

 }

}

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Q.no. 2(a): Write a java program to sort n-integer numbers using bubble sort.prepare port(int[]) to pass unsorted array and display(int[]) to receive sorted array and display the sorted integers.consider suitable return types.

1. sort class to sort n numbers having sort() method in that

2.display ()method in any class

3. demo class to read numbers and to sort them.

 import java.util.Scanner;

class BSort {

int[] sortt(int[] array, int n){

int c, d, swap;

 for (c = 0; c < ( n - 1 ); c++) {

 for (d = 0; d < n - c - 1; d++) {

 if (array[d] > array[d+1])

 {

 swap = array[d];

 array[d] = array[d+1];

 array[d+1] = swap;

 }

}

}

 return array;

}

void display(int[] x,int n){

System.out.println("Sorted list of numbers");

 for (int c = 0; c < n; c++)

 System.out.println(x[c]);

}

}

class BSortDemo{

public static void main(String []args) {

 int n, c;

 Scanner in = new Scanner(System.in);

 BSort bs = new BSort();

 System.out.println("Input number of integers to sort");

 n = in.nextInt();

 int ari[] = new int[n];

 int aro[] = new int[n];

 System.out.println("Enter " + n + " integers");

 for (c = 0; c < n; c++)

 ari[c] = in.nextInt();

 aro=bs.sortt(ari,n);

 bs.display(aro,n);

 }

}

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Q.no. 2(b): Develop a java program to read four marks to calculate total and average. Do it for four students and display all four totals in ascending order using bubble sort.

 import java.util.Scanner;

class BSort {

int[] sortt(int[] array, int n){

int c, d, swap;

 for (c = 0; c < ( n - 1 ); c++) {

 for (d = 0; d < n - c - 1; d++) {

 if (array[d] > array[d+1])

 {

 swap = array[d];

 array[d] = array[d+1];

 array[d+1] = swap;

 }

}

}

 return array;

}

void display(int[] x,int n){

System.out.println("Sorted list of numbers");

 for (int c = 0; c < n; c++)

 System.out.println(x[c]);

}

}

class BSortMarks{

public static void main(String []args) {

 int n, c,sum=0;

 Scanner in = new Scanner(System.in);

 BSort bs = new BSort();

 System.out.println("Input number of students");

 n = in.nextInt();

 int ari[] = new int[n];

 int aro[] = new int[n];

 for (int c1 = 0; c1 < 4; c1++){

 System.out.println("Enter 4 marks");

 for (c = 0; c < 4; c++)

 sum=sum+in.nextInt();

 ari[c1] = sum;

 }

 aro=bs.sortt(ari,n);

 bs.display(aro,n);

 }

}

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**3(a)Write a java Program to read three marks using constructor and calculate total as a private variable,display total in the same class and display total in another demo class.**

importjava.util.\*;

classThirdA

{

 int marks1,marks2,marks3;

 privateint total;

 ThirdA(int m1,int m2,int m3)

 {

 marks1=m1;

 marks2=m2;

 marks3=m3;

 }

 void total()

 {

 int total=marks1+marks2+marks3;

 System.out.println("Total Marks="+total);

 }

}

classThirdADemo

{

public static void main(String[] args)

{

Scanner s=new Scanner(System.in);

System.out.println("Enter Three Subjects Marks");

int m1=s.nextInt();

int m2=s.nextInt();

int m3=s.nextInt();

ThirdA obj1=new ThirdA(m1,m2,m3);

obj1.total();

int total=m1+m2+m3;

System.out.println("Total marks in Demo class="+total);

}

}

Output:

D:\>java ThirdADemo

Enter Three Subjects Marks

25

20

20

Total Marks=65

Total marks in Demo class=65

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**3(b)Develop a java program to read three marks using constructor overloading and calculate total and average as two private variables,display total and average in the same class and display both in the another demo class.**

importjava.util.\*;

classThirdB

{

 int marks1,marks2,marks3;

 privateinttotal,average;

 ThirdB()

 {

 marks1=0;

 marks2=0;

 marks3=0;

 System.out.println("In Zero-arg Constructor");

 System.out.println("marks1="+marks1);

 System.out.println("marks2="+marks2);

 System.out.println("marks3="+marks3);

 }

 ThirdB(int m1)

 {

 marks1=m1;

 System.out.println("In 1-arg Constructor");

 System.out.println("marks1="+marks1);

 }

 ThirdB(int m1,int m2)

 {

 marks1=m1;

 marks2=m2;

 System.out.println("In 2-arg Constructor");

 System.out.println("marks1="+marks1);

 System.out.println("marks2="+marks2);

 }

 ThirdB(int m1,int m2,int m3)

 {

 marks1=m1;

 marks2=m2;

 marks3=m3;

 System.out.println("In 3-arg Constructor");

 System.out.println("marks1="+marks1);

 System.out.println("marks2="+marks2);

 System.out.println("marks3="+marks3);

 }

 void total()

 {

 total=marks1+marks2+marks3;

 System.out.println("Total Marks="+total);

 }

 void average()

 {

 average=total/3;

 System.out.println("Average of 3 marks="+average);

 }

}

classThirdBDemo

{

public static void main(String[] args)

{

Scanner s=new Scanner(System.in);

System.out.println("Enter Three Subjects Marks");

int m1=s.nextInt();

int m2=s.nextInt();

int m3=s.nextInt();

System.out.println("=======================");

ThirdB b1=new ThirdB();

b1.total();

System.out.println("=======================");

System.out.println("--------------------------");

ThirdB b2=new ThirdB(m1);

b2.total();

System.out.println("----------------------------");

System.out.println("@@@@@@@@@@@@@@@@@@@@@@@@@@@@@");

ThirdB b4=new ThirdB(m1,m2);

b4.total();

System.out.println("@@@@@@@@@@@@@@@@@@@@@@@@@@@@@");

System.out.println("\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*");

ThirdB b3=new ThirdB(m1,m2,m3);

b3.total();

b3.average();

System.out.println("\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*");

int total=m1+m2+m3;

intavg=total/3;

System.out.println("Total marks in Demo class="+total);

System.out.println("Average="+avg);

}

}

Output:

D:\>javac ThirdBDemo.java

D:\>java ThirdBDemo

Enter Three Subjects Marks

20

20

20

=======================

In Zero-arg Constructor

marks1=0

marks2=0

marks3=0

Total Marks=0

=======================

--------------------------

In 1-arg Constructor

marks1=20

Total Marks=20

----------------------------

@@@@@@@@@@@@@@@@@@@@@@@@@@@@@

In 2-arg Constructor

marks1=20

marks2=20

Total Marks=40

@@@@@@@@@@@@@@@@@@@@@@@@@@@@@

\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

In 3-arg Constructor

marks1=20

marks2=20

marks3=20

Total Marks=60

Average of 3 marks=20

\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

Total marks in Demo class=60

Average=20

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**4(a)Write a Java program to read three marks using constructor and calculate total as a private variable,display total in the same class and display total in the another demo class.write anyone static method to display results.write anyone static method to display results,include anyone static block.**

importjava.util.\*;

classFourA

{

 staticint marks1,marks2,marks3;

 static private int total;

 static

 {

 System.out.println("Inside Static Block");

 Scanner s=new Scanner(System.in);

 System.out.println("Enter Three Subjects Marks");

 int m1=s.nextInt();

 int m2=s.nextInt();

 int m3=s.nextInt();

 total=m1+m2+m3;

System.out.println("Total in Static block="+total);

 System.out.println("---------------------");

 }

 FourA(int m1,int m2,int m3)

 {

 marks1=m1;

 marks2=m2;

 marks3=m3;

 System.out.println("marks1="+marks1);

 System.out.println("marks2="+marks2);

 System.out.println("marks3="+marks3);

 }

 static void total()

 {

 total=marks1+marks2+marks3;

 System.out.println("Total Marks="+total);

 }

}

classFourADemo

{

public static void main(String[] args)

{

Scanner s=new Scanner(System.in);

System.out.println("Enter Three Subjects Marks");

int m1=s.nextInt();

int m2=s.nextInt();

int m3=s.nextInt();

FourA a=new FourA(m1,m2,m3);

//b.total();

a.total();

int total=m1+m2+m3;

System.out.println("Total marks in Demo class="+total);

}

}

OUTPUT:

D:>java FourADemo

Enter Three Subjects Marks

15

20

20

Inside Static Block

Enter Three Subjects Marks

15

20

20

Total in Static block=55

---------------------

marks1=15

marks2=20

marks3=20

Total Marks=55

Total marks in Demo class=55

--------------------------------------------------------------------------------------------------------------------------------

**4(b)Develop a java program to read three marks using constructor overloading and calculate total and average as two private variables,display total and average in the same class and display both in the another demo class.**

importjava.util.\*;

classFourB

{

 int marks1,marks2,marks3;

 privateinttotal,average;

 FourB()

 {

 marks1=0;

 marks2=0;

 marks3=0;

 System.out.println("In Zero-arg Constructor");

 System.out.println("marks1="+marks1);

 System.out.println("marks2="+marks2);

 System.out.println("marks3="+marks3);

 }

 FourB(int m1)

 {

 marks1=m1;

 System.out.println("In 1-arg Constructor");

 System.out.println("marks1="+marks1);

 }

 FourB(int m1,int m2)

 {

 marks1=m1;

 marks2=m2;

 System.out.println("In 2-arg Constructor");

 System.out.println("marks1="+marks1);

 System.out.println("marks2="+marks2);

 }

 FourB(int m1,int m2,int m3)

 {

 marks1=m1;

 marks2=m2;

 marks3=m3;

 System.out.println("In 3-arg Constructor");

 System.out.println("marks1="+marks1);

 System.out.println("marks2="+marks2);

 System.out.println("marks3="+marks3);

 }

 void total()

 {

 total=marks1+marks2+marks3;

 System.out.println("Total Marks="+total);

 }

 void average()

 {

 average=total/3;

 System.out.println("Average of 3 marks="+average);

 }

}

classFourBDemo

{

public static void main(String[] args)

{

Scanner s=new Scanner(System.in);

System.out.println("Enter Three Subjects Marks");

int m1=s.nextInt();

int m2=s.nextInt();

int m3=s.nextInt();

FourB b1=new FourB();

b1.total();

FourB b2=new FourB(m1);

b2.total();

FourB b3=new FourB(m1,m2);

b3.total();

FourB b4=new FourB(m1,m2,m3);

b4.total();

b4.average();

System.out.println("\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*");

int total=m1+m2+m3;

intavg=total/3;

System.out.println("Total marks in Demo class="+total);

System.out.println("Average="+avg);

}

}

Output:

D:\>javac FourBDemo.java

D:\>java FourBDemo

Enter Three Subjects Marks

15

15

15

In Zero-arg Constructor

marks1=0

marks2=0

marks3=0

Total Marks=0

In 1-arg Constructor

marks1=15

Total Marks=15

In 2-arg Constructor

marks1=15

marks2=15

Total Marks=30

In 3-arg Constructor

marks1=15

marks2=15

marks3=15

Total Marks=45

Average of 3 marks=15

\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

Total marks in Demo class=45

Average=15

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5A) Write a java program to read 3 marks using constructor

overloading, assume pass mark.

Write a private passFail() method to display the result is pass or fail.

Make necessary arrangement to display result from another demo class also.

Note:-

Overloaded Constructor, private passFail() method and result display must be present.

Steps:-

1. Declare class Marks

2. Declare 2 constructors, which will read an input of 3 marks and update marks.

3. Declare private method passFail() inside the class.

4. The method should assume a pass mark and compute pass or fail.

5. Declare a method, displayResult() that will in turn call passFail() method.

6. From a Test class, main(), create an object of Marks and call displayResult()

7. Optionally, create another Marks object, invoking the second constructor.

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// Program:-

// Filename FiveATest.java

import java.util.Scanner;

class Marks

{

 int m1, m2, m3;

 Marks() // Constructor

 {

 Scanner in = new Scanner(System.in);

 System.out.print("Enter 3 Integer Marks:");

 m1 = in.nextInt();

 m2 = in.nextInt();

 m3 = in.nextInt();

 }

 Marks(int a) // Constructor overloading

 // Same logic as above

 {

 Scanner in = new Scanner(System.in);

 System.out.print("Enter 3 Integer Marks:");

 m1 = in.nextInt();

 m2 = in.nextInt();

 m3 = in.nextInt();

 }

 private void passFail()

 {

 int passMark = 40;

 if ( (m1 < passMark) | (m2 < passMark) | (m3 < passMark) )

 System.out.println("Fail");

 else System.out.println("Pass");

 }

 void displayResult()

 {

 passFail();

 }

}//========================================================================

class FiveATest

{

 public static void main(String[] args)

 {

 Marks m1 = new Marks();

 m1.displayResult();

 Marks m2 = new Marks(1);

 m2.displayResult();

 }

}

//=========================================================================\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

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5B) Write a java program to read 3 marks, assume pass mark.

Write a static passFail() method to display the result is pass or fail.

Make necessary arrangement to display result from another demo class also.

Note:-

Scanner input of 3 marks, static passFail() method, result display must be present.

Steps:-

1. Declare class Test

2. Declare static method passFail() inside this class.

3. The method should assume a pass mark and compute pass or fail.

4. From main(), accept input of 3 marks using Scanner.

5. Call the passFail() method.

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// Program:-

// Filename FiveBTest.java

import java.util.Scanner;

class FiveBTest

{

 static void passFail(int a, int b, int c)

 {

 int passMark = 40;

 if ( (a < passMark) | (b < passMark) | (c < passMark) )

 System.out.println("Fail");

 else System.out.println("Pass");

 }

 public static void main(String[] args)

 {

 int m1, m2, m3;

 Scanner in = new Scanner(System.in);

 System.out.print("Enter 3 Integer Marks:");

 m1 = in.nextInt();

 m2 = in.nextInt();

 m3 = in.nextInt();

 FiveBTest.passFail(m1, m2, m3);

 }

}

//=========================================================================Q.no. /\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

6A) Write a java program to issue tickets for a journey.

Use constructor for data input.

Compute amountPay depends on number of tickets purchased.

There are adult and child ticket types.

You can fix the price for the tickets.

Use atleast two issueTicket() overloading methods : one for express and

second one for passenger.

Note:-

Constructor, Scanner input, overloaded issueTicket() and amountPay must be all present.

Steps:-

1. Declare class Ticket

2. Declare constructor, which will ask whether express/passenger and number of

 tickets needed for adult,child. Update instance variables.

3. Declare method issueTicket() inside the class to compute pay for express and display.

 // assume some rates for adult,child

4. Declare overloaded method issueTicket(int a) to compute pay for passenger and display.

 // assume some rates for adult,child

5. From a Test class, main(), create an object of Ticket

 and call issueTicket() for express,

 issueTicket(1) for passenger.

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// Program:-

// Filename SixATest.java

import java.util.Scanner;

class Ticket

{

 int nAdultExp, nChildExp; // number of tickets

 int nAdultPass, nChildPass;

 Ticket() // Constructor

 {

 int a,c; int exp;

 Scanner in = new Scanner(System.in);

 System.out.print("Enter 1:Express Or 2:Passenger:");

 exp = in.nextInt();

 System.out.print("Enter Number of Adult Tickets:");

 a = in.nextInt();

 System.out.print("Enter Number of Child Tickets:");

 c = in.nextInt();

 if (exp == 1) { nAdultExp = a; nChildExp = c; }

 else { nAdultPass = a; nChildPass = c;}

 }

 void issueTicket() // Express

 {

 int childExpRate = 30; int AdultExpRate= 50;

 int amountPay;

 amountPay = nAdultExp \* AdultExpRate +

 nChildExp \* childExpRate;

 if (amountPay >0) // this 'if' is optional

 System.out.println("Amount to pay for Express=" +amountPay);

 }

 void issueTicket(int a) // Passenger

 {

 int childPassRate = 20; int AdultPassRate= 40;

 int amountPay;

 amountPay = nAdultPass \* AdultPassRate +

 nChildPass \* childPassRate;

 if (amountPay >0) // this 'if' is optional

 System.out.println("Amount to pay for Passenger=" +amountPay);

 }

}//========================================================================

class SixATest

{

 public static void main(String[] args)

 {

 Ticket t = new Ticket();

 t.issueTicket(); // Express

 t.issueTicket(1); // Passenger

 }

}

//=========================================================================

6B) Write a java program to issue tickets for a journey.

Use constructor overloading for data input.

Compute amountPay depends on number of tickets purchased.

There are adult and child ticket types.

You can fix the price for the tickets.

Use atleast two issueTicket() overloading methods : one for express and

second one for passenger.

Note:-

Overloaded Constructors, Scanner input,

 overloaded issueTicket() and amountPay must be all present.

Steps:-

1. Declare class Ticket

2. Declare 2 overloaded constructors, one for Express and another for Passenger.

 Update instance variables.

3. Declare method issueTicket() inside the class to compute pay for express and display.

 // assume some rates for adult,child

4. Declare overloaded method issueTicket(int a) to compute pay for passenger and display.

 // assume some rates for adult,child

5. From a Test class, main(),

 ask user for Express or Passenger

 create an object of Ticket

 with appropriate constructor for Express/Passenger

 call issueTicket() for express,

 issueTicket(1) for passenger.

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// Program:-

// Filename SixBTest.java

import java.util.Scanner;

class Ticket

{

 int nAdultExp, nChildExp; // number of tickets

 int nAdultPass, nChildPass;

 Ticket() // Constructor for Express

 {

 int a,c;

 Scanner in = new Scanner(System.in);

 System.out.print("Enter Number of Adult Tickets:");

 a = in.nextInt();

 System.out.print("Enter Number of Child Tickets:");

 c = in.nextInt();

 nAdultExp = a; nChildExp = c;

 }

 Ticket(int x) // Constructor for Passenger

 {

 int a,c;

 Scanner in = new Scanner(System.in);

 System.out.print("Enter Number of Adult Tickets:");

 a = in.nextInt();

 System.out.print("Enter Number of Child Tickets:");

 c = in.nextInt();

 nAdultPass = a; nChildPass = c;

 }

 void issueTicket() // Express

 {

 int childExpRate = 30; int AdultExpRate= 50;

 int amountPay;

 amountPay = nAdultExp \* AdultExpRate +

 nChildExp \* childExpRate;

 if (amountPay >0) // this 'if' is optional

 System.out.println("Amount to pay for Express=" +amountPay);

 }

 void issueTicket(int a) // Passenger

 {

 int childPassRate = 20; int AdultPassRate= 40;

 int amountPay;

 amountPay = nAdultPass \* AdultPassRate +

 nChildPass \* childPassRate;

 if (amountPay >0) // this 'if' is optional

 System.out.println("Amount to pay for Passenger=" +amountPay);

 }

}//========================================================================

class SixBTest

{

 public static void main(String[] args)

 {

 int exp;

 Scanner in = new Scanner(System.in);

 System.out.print("Enter 1:Express Or 2:Passenger:");

 exp = in.nextInt();

 if (exp==1) // Express

 { Ticket t = new Ticket();

 t.issueTicket();

 }

 else // Passenger

 { Ticket t = new Ticket(1);

 t.issueTicket(1);

 }

 }

}

//=========================================================================

 **------------------------------- End of Key TEST 2-------------------------**