**BITAM/9/21/004/TZ**

**CYCLE SHEET ONE**

**Question 1: Basic Program/Personal Information**

import java.util.Scanner;

class Personal{

    public static void main(String[] args){

        try{

            Scanner put = new Scanner(System.in);

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

            String reg = put.nextLine();

            System.out.println("Enter FullName ");

            String name = put.nextLine();

            System.out.println("Enter CGPA");

            float gpa = put.nextFloat();

            System.out.println("Enter Program name");

            String program = put.nextLine();

            System.out.println("Enter School name");

            String school = put.nextLine();

            System.out.println("Enter Proctor name");

            String proctor = put.nextLine();

            System.out.println("Your information is:\n");

            System.out.println("Registration: "+reg);

            System.out.println("FullName: "+name);

            System.out.println("CGPA: "+gpa);

            System.out.println("Program: "+program);

            System.out.println("school: "+school);

            System.out.println("Proctor name: "+proctor);

        }catch(Exception e){

            System.out.println("Something went wrong ");

        }

    }

}

**Question 2: Airline**

import java.util.Scanner;

public class AirlinesReservation{

    //Array of seats

    boolean[] flightSeats = new boolean[11];

    Scanner put = new Scanner(System.in);

    public void start(){

        while (true){

            bookSeat();

        }

    }

    public void bookSeat(){

        //Asks user for his preffered class to travel

        System.out.println("Choose Your preference : type '1' for First Class or '2' for Economy Class:");

        int pessangerClass = put.nextInt();

        if(pessangerClass == 1)firstClassBooking();

        else economyClassBooking();

    }

    // Check and book for first class seating

    public void firstClassBooking(){

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

            //check if seat is available to allocate to user booking.

            if(flightSeats[cnt] == false )

            {

                //book seat

                flightSeats[cnt] = true;

                System.out.printf("First Class Seat Booking: Seat# %d\n", cnt);

                break;

            }

            else if( flightSeats[5] == true )

            {

                if ( flightSeats[10] == true)

                {

                    //if both classes are fully booked

                    System.out.println("Apologies!! All seats are booked. Next flight is scheduled in '3' hours.");

                }

                else

                {

                    // provide pessanger another available class option

                    System.out.println("Sorry,First Class bookings are over. Would you like to opt for Economy class ? select '1' for Yes and '2' for No");

                    int selection = put.nextInt();

                    if ( selection == 1 )

                    {

                    economyClassBooking();

                    start();

                    }

                    else

                    {

                    System.out.println("Next flight is scheduled in '3' hours.");

                    System.exit(0);

                    }

                }

            }

        }

    }

    // Check and book for economy class seating

    public void economyClassBooking() // assign an economy seat

    {

        for ( int cnt = 6; cnt <= 10; cnt++ )

        {

            if ( flightSeats[cnt] == false )

            {

                flightSeats[cnt] = true;

                System.out.printf("economy class seat booking :# %d\n", cnt);

                break;

            }

            else if ( flightSeats[10] == true )

            {

                if ( flightSeats[5] == true)

                {

                    System.out.println("Apologies!! All seats are booked. Next flight is scheduled in '3' hours.");

                    System.exit(0);

                }

                else

                {

                    System.out.println("Sorry, Economy Class seat bookings are over. Would you like to opt for first Class seat? press '1' for Yes and '2' for No");

                    int selection = put.nextInt();

                    if ( selection == 1 )

                    {

                        firstClassBooking();

                        start();

                    }

                    else

                    {

                        System.out.println("Next flight is scheduled in 3 hours");

                        System.exit(0);

                    }

                }

            }

        }

    }

    public static void main(String[] args) {

        System.out.println("WELCOME TO AIRLINES RESERVATION SYSTEM");

        AirlinesReservation airline = new AirlinesReservation();

        airline.start();

    }

}

**Question 3: Mathpremier League**

import java.util.\*;

class MPL{

    Scanner put=new Scanner(System.in);

    int standard;

    int num\_students;

    public int first;

    public float average;

    int student\_first;

    MPL(int a, int b){

        standard = a;

        num\_students=b;

        mark(num\_students);

    }

    public void mark(int num\_students){

        int max =0;

        int[] marks = new int[num\_students];

        int average\_class=0;

        System.out.println("Enter the marks of students");

        for(int i =0;i<num\_students;i++){

            marks[i]=put.nextInt();

            average\_class=average\_class+marks[i];

            if(marks[i]>max){

                max=marks[i];

                student\_first=i+1;

            }

        }

        first=student\_first;

        average=average\_class/num\_students;

    }

    public void display(){

        System.out.println("Standard:- "+ standard);

        System.out.println("No of students:- "+ num\_students);

        System.out.println("First student:- "+ first);

        System.out.println("Average of the class:- "+ average);

    }

}

import java.util.\*;

class TestMathpremier{

    static MPL mpl[] = new MPL[2];

    public static void main(String args[]){

        Scanner put = new Scanner(System.in);

        int first=0;

        float avg=0;

        for(int i=0;i<2;i++){

            System.out.println("Enter the number of students in class "+(i+1));

            int students = put.nextInt();

            mpl[i] = new MPL(i,students);

            mpl[i].display();

        }

        bestclass();

        avgbestclass();

    }

    public static void bestclass(){

        float max=0;int standard=0;

        for(int i=0;i<2;i++){

            if(mpl[i].average>max){

                max=mpl[i].average;standard=i+1;

            }

        }

        System.out.println("The best class on the basis of average is : "+standard);

    }

    public static void avgbestclass(){

        float max=0;

        int standard=0;

        for(int i=0;i<2;i++){

            if(mpl[i].first>max){

                max=mpl[i].first;

                standard=i+1;

            }

        }

        System.out.println("The best class on the basis of average is : "+standard);

    }

}

**Question 4: Inheritance**

class TestDetails {

    float[][] marks;

    int numOfStudents = 25;

    void storeMarks(int studentId, int numTests, float[] testScores) {

        if (marks == null) {

            marks = new float[numOfStudents][7];

        }

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

            marks[studentId][i] = testScores[i];

        }

    }

    void displayMarks() {

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

            System.out.print("Student " + i + ": ");

            for (int j = 0; j < 7; j++) {

                System.out.print(marks[i][j] + " ");

            }

            System.out.println();

        }

    }

}

class NoticePeriod extends TestDetails {

    void countInBench() {

        int count = 0;

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

            int numTestsTaken = 0;

            int numTestsPassed = 0;

            for (int j = 0; j < 7; j++) {

                if (marks[i][j] != 0) {

                    numTestsTaken++;

                    if (marks[i][j] >= 50) {

                        numTestsPassed++;

                    }

                }

                if (numTestsPassed >= 3 || numTestsTaken >= 3) {

                    break;

                }

            }

            if (numTestsTaken < 3 || numTestsPassed < 3) {

                count++;

                System.out.println("Student " + i + " is in bench");

            }

        }

        System.out.println("Number of students in bench: " + count);

    }

}

class Main {

    public static void main(String[] args) {

        TestDetails td = new TestDetails();

        td.storeMarks(0, 4, new float[]{60, 70, 80, 90});

        td.storeMarks(1, 3, new float[]{50, 60, 70});

        td.displayMarks();

        NoticePeriod np = new NoticePeriod();

        np.countInBench();

    }

}

**Question 5:Interface**

public interface GCD{

    abstract int computeGCD(int num1,int num2);

}

import java.util.\*;

class APPROACH1 implements GCD{

    // Euclid Method (num1>num2)

    public int computeGCD(int num1, int num2){

        if (num2 == 0) {

            return num1;

        }else return computeGCD(num2, num1 % num2);

    }

}

class APPROACH2 implements GCD{

    // Listing all factors (Assuming num1>num2)

    public int computeGCD(int num1, int num2){

        int gcd = 1;

        for(int i=num2;i>1;i--){

            if(num1%i == 0 && num2%i==0){

                gcd = i;

                break;

            }

        }

        return(gcd);

    }

}

class ProblemTest{

    public static void main(String[] args){

        Scanner put = new Scanner(System.in);

        System.out.println("Enter num1");

        int num1 = put.nextInt();

        System.out.println("Enter num2");

        int num2 = put.nextInt();

        APPROACH1 newAPPROACH1 = new APPROACH1();

        APPROACH2 newAPPROACH2 = new APPROACH2();

        System.out.println("GCD by Euclid's method: " +newAPPROACH1.computeGCD(num1,num2));

        System.out.println("GCD by listing all factors: " + newAPPROACH2.computeGCD(num1,num2));

    }

}

**Question 6: Exception Handling**

public class SameColourBallException extends Exception{

    SameColourBallException(int x){

        System.out.println("Same colour was picked more than thrice");

    }

}

import java.lang.Math;

public class Balls{

    public static void main(String[] args) {

        int rand;

        int r=0,g=0,b=0,y=0;

        for(int i=0;i<10;i++){

            rand = (int) ((Math.random() \* ((4 - 1) + 1)) + 1);

            if(rand==1)r++;

            if(rand==2)g++;

            if(rand==3)b++;

            if(rand==4)y++;

            try{

                if(r>3 || g>3 || b>3 || y>3){

                    throw new SameColourBallException(0);

                }

            }catch(SameColourBallException exp){

                    System.out.println("Error Caught");

                }

            }

            System.out.println(r);

            System.out.println(g);

            System.out.println(b);

            System.out.println(y);

        }

    }