**THE STATE UNIVERSITY OF ZANZIBAR**

**DEPARTMENT OF COMPUTER SCIENCES AND INFORMATION TECHNOLOGY**



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**Qn**

import java.util.Scanner;

class Student {

    String regNo;

    String name;

    float cgpa;

    String programName;

    String schoolName;

    String proctorName;

}

import java.util.Scanner;

public class Main {

   public static void main(String[] args) {

        Scanner sc = new Scanner(System.in);

        System.out.print("Enter the number of students: ");

        int n = sc.nextInt();

        Student[] students = new Student[n];

        sc.nextLine(); // to consume the newline character after reading the integer

        for (int i = 0; i < n; i++) {

            students[i] = new Student();

            System.out.print("Enter registration number of student " + (i + 1) + ": ");

            students[i].regNo = sc.nextLine();

            System.out.print("Enter name of student " + (i + 1) + ": ");

            students[i].name = sc.nextLine();

            System.out.print("Enter CGPA of student " + (i + 1) + ": ");

            students[i].cgpa = sc.nextFloat();

            sc.nextLine(); // to consume the newline character after reading the float

            System.out.print("Enter programme name of student " + (i + 1) + ": ");

            students[i].programName = sc.nextLine();

            System.out.print("Enter school name of student " + (i + 1) + ": ");

            students[i].schoolName = sc.nextLine();

            System.out.print("Enter proctor name of student " + (i + 1) + ": ");

            students[i].proctorName = sc.nextLine();

        }

        for (int i = 0; i < n; i++) {

            System.out.println("Details of student " + (i + 1) + ":");

            System.out.println("Registration number: " + students[i].regNo);

            System.out.println("Name: " + students[i].name);

            System.out.println("CGPA: " + students[i].cgpa);

            System.out.println("Programme name: " + students[i].programName);

            System.out.println("School name: " + students[i].schoolName);

            System.out.println("Proctor name: " + students[i].proctorName);

        }

    }

}

**Qn2**

import java.util.Scanner;

public class AirlineReservationSystem {

  public static void main(String[] args) {

    boolean[] seats = new boolean[10]; // boolean array to keep track of seat availability

    Scanner sc = new Scanner(System.in);

    while (true) {

      System.out.println("Please type 1 for First Class or 2 for Economy: ");

      int section = sc.nextInt();

      // Check if first class seats are available

      if (section == 1) {

        for (int i = 0; i < 5; i++) {

          if (!seats[i]) {

            seats[i] = true; // assign seat

            System.out.println("First Class. Seat number: " + (i + 1));

            break;

          }

          // If all first class seats are taken, offer economy class

          if (i == 4 && seats[i]) {

            System.out.println("First Class is full. Would you like to be placed in Economy? (yes/no)");

            String choice = sc.next();

            if (choice.equals("yes")) {

              section = 2;

            } else {

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

              break;

            }

          }

        }

      }

      // Check if economy class seats are available

      if (section == 2) {

        for (int i = 5; i < 10; i++) {

          if (!seats[i]) {

            seats[i] = true; // assign seat

            System.out.println("Economy Class. Seat number: " + (i + 1));

            break;

          }

          // If all economy class seats are taken, offer first class

          if (i == 9 && seats[i]) {

            System.out.println("Economy Class is full. Would you like to be placed in First Class? (yes/no)");

            String choice = sc.next();

            if (choice.equals("yes")) {

              section = 1;

            } else {

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

              break;

            }

          }

        }

      }

    }

  }

}

**Qn3**

class MPL {

    int standard;

    int numOfStudents;

    int[] marks;

    int firstMark;

    public MPL(int standard, int numOfStudents) {

        this.standard = standard;

        this.numOfStudents = numOfStudents;

        this.marks = new int[numOfStudents];

        Scanner sc = new Scanner(System.in);

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

            System.out.print("Enter marks of student " + (i + 1) + ": ");

            marks[i] = sc.nextInt();

        }

        firstMark = marks[0];

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

            if (marks[i] < firstMark) {

                firstMark = marks[i];

            }

        }

    }

    public void findBestClass() {

        int maxStandard = 0;

        int maxFirstMark = 0;

        for (int i = 0; i < 4; i++) {

            if (MPL[i].firstMark > maxFirstMark) {

                maxStandard = MPL[i].standard;

                maxFirstMark = MPL[i].firstMark;

            }

        }

        System.out.println("The standard with the highest first mark is: " + maxStandard);

    }

    public void findBestClass(int option) {

        int maxStandard = 0;

        int maxAverage = 0;

        int sum;

        int average;

        for (int i = 0; i < 4; i++) {

            sum = 0;

            for (int j = 0; j < MPL[i].numOfStudents; j++) {

                sum += MPL[i].marks[j];

            }

            average = sum / MPL[i].numOfStudents;

            if (average > maxAverage) {

                maxStandard = MPL[i].standard;

                maxAverage = average;

            }

        }

        System.out.println("The standard with the highest class average is: " + maxStandard);

    }

}

**Qn4**

import java.util.Scanner;

class TestDetails {

    float[][] marks;

    int rows, cols;

    TestDetails(int rows, int cols) {

        this.rows = rows;

        this.cols = cols;

        marks = new float[rows][cols];

    }

    void storeMarks() {

        Scanner sc = new Scanner(System.in);

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

            System.out.println("Enter number of tests taken by student " + (i + 1));

            int testsTaken = sc.nextInt();

            System.out.println("Enter marks scored in each test:");

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

                marks[i][j] = sc.nextFloat();

            }

        }

    }

    void displayMarks() {

        System.out.println("Student marks:");

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

            System.out.print("Student " + (i + 1) + ": ");

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

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

            }

            System.out.println();

        }

    }

}

class NoticePeriod extends TestDetails {

    NoticePeriod(int rows, int cols) {

        super(rows, cols);

    }

    void countAndPrintNoticePeriodStudents() {

        int count = 0;

        System.out.println("Notice Period Students:");

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

            int testsTaken = 0, testsPassed = 0;

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

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

                    testsTaken++;

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

                        testsPassed++;

                    }

                }

                if (testsPassed >= 3) {

                    break;

                }

            }

            if (testsTaken < 3 || testsPassed < 3) {

                count++;

                System.out.println("ID: " + (i + 1));

            }

        }

        System.out.println("Number of notice period students: " + count);

    }

}

import java.util.Scanner;

public class Details {

    public static void main(String[] args) {

        Scanner obj = new Scanner(System.in);

        System.out.println("Enter number of students:");

        int rows = obj.nextInt();

        System.out.println("Enter number of tests:");

        int cols = obj.nextInt();

        TestDetails TD = new TestDetails(rows, cols);

        TD.storeMarks();

        TD.displayMarks();

        NoticePeriod NP = new NoticePeriod(rows, cols);

        NP.countAndPrintNoticePeriodStudents();

    }

}

**Qn5**

interface GCD {

    int computeGCD(int num1, int num2);

}

class APPROACH1 implements GCD {

    public int computeGCD(int num1, int num2) {

        if (num2 == 0) {

            return num1;

        }

        return computeGCD(num2, num1 % num2);

    }

}

class APPROACH2 implements GCD {

    public int computeGCD(int num1, int num2) {

        int gcd = 1;

        for (int i = 1; i <= num1 && i <= num2; i++) {

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

                gcd = i;

            }

        }

        return gcd;

    }

}

public class InterSecond{

    public static void main(String[] args) {

        GCD approach1 = new APPROACH1();

        GCD approach2 = new APPROACH2();

        int num1 = 36, num2 = 48;

        System.out.println("GCD of " + num1 + " and " + num2 + " using APPROACH1: " + approach1.computeGCD(num1, num2));

        System.out.println("GCD of " + num1 + " and " + num2 + " using APPROACH2: " + approach2.computeGCD(num1, num2));

    }

}

**Qn6**

import java.util.Random;

class SameColorBallException extends Exception{

    public static void main (String[]args){

}

    public SameColorBallException(String message){

            super(message);

    }

class Main {

    public static void main(String[] args) {

        String[] colors = {"red", "green", "blue", "yellow"};

        int[] count = {0, 0, 0, 0};

        Random me = new Random();

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

            try {

                String color = colors[me.nextInt(4)];

                switch (color) {

                    case "red":

                        count[0]++;

                        break;

                    case "green":

                        count[1]++;

                        break;

                    case "blue":

                        count[2]++;

                        break;

                    case "yellow":

                        count[3]++;

                        break;

                }

                if (count[0] > 3) {

                    throw new SameColorBallException("Too many red balls");

                }

                if (count[1] > 3) {

                    throw new SameColorBallException("Too many green balls");

                }

                if (count[2] > 3) {

                    throw new SameColorBallException("Too many blue balls");

                }

                if (count[3] > 3) {

                    throw new SameColorBallException("Too many yellow balls");

                }

            } catch (SameColorBallException e) {

                i--;

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

            }

        }

        System.out.println("Number of red balls: " + count[0]);

        System.out.println("Number of green balls: " + count[1]);

        System.out.println("Number of blue balls: " + count[2]);

        System.out.println("Number of yellow balls: " + count[3]);

    }

}

}