STIA1113 PROGRAMMING 1

FIRST SEMESTER SESSION 2021/2022 (A211)

ASSIGNMENT 2

TOPIC:

UNIVERSITY

PREPARED FOR:

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PREPARED BY:

GROUP 4

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TOPIC EMPLOYEES - SITI NUR AISYAH BINTI ABDULLAH

1. Identify problem:

In some institutions hourly-paid teaching staff are paid a comprehensive teaching rate for every hour of teaching that is supposed to cover other duties such as preparation, marking, administration and attending meetings. They face a problem when they have hazy understanding of how the salary have been paid according to their types of lecturers. This makes it difficult to calculate an accurate monthly wage.

However, lecturers generally consist of several types or classes. This depends on the offer made by the university. Over time, when a new campus opens, the number of students recruited increases and indirectly, the teaching staff required also increases. Therefore, new employees were recruited to cover the shortage of lecturers.

They are several types of lecturers in university:

i. Permanent Lecturer

Permanent lecturers are lecturers who are confirmed positions in university. The average permanent lecturer has a master's degree. However, there may still be lecturers with a degree who are serving.

ii. Contract Lecturer

Contract lecturers may consist of two small groups either from scholarship holder or from lecturers who have served for a long time and were appointed to contract positions. For the scholarship holder lecturer, the contract lecturer referred to here is a probationary period before being confirmed for a permanent position. However, they will be called to teach even they has not yet completed their studies. In fact, there are also many lecturers who have served but have not completed their studies in the master's field.

iii. Part Time Full Time Lecturer(PTFT)

In some places, it is also known as a package lecturer. PTFT lecturers only needed while waiting for the return of the contract lecturer according to the semester. Unlike permanent or contract lecturers, there salaries are paid by the Malaysian government. If the government announces a bonus, this bonus is only enjoyed by permanent or contract staff. In fact, PTFT only gets a basic salary.

2. Understanding the problem:

A salary or wages is the payment typically paid on monthly basis. The lecturers who are teaching at Universiti Utara Malaysia (UUM) are paid per hour according to their respective work codes. 10% and 0.5% of the salary will be deducted to the Employees Provident Fund (EPF) and Employee SOCSO, and they will get an allowance for every month. They have to keep the pay slip for future use and the pay slip must have detailed information such as name, identification number, work code, month of payslip, amount of allowance and deduction and the net salary. The table below show the general information for lecturers use to key in their details. They have to key in other information such as name and identification number to confirmed their salary.

Types of lecturer	Permanent Lecturer	Contract Lecturer	PTFT Lecturer
Work code	DPL45	DCL51	DP441
Salary per hour	RM132.00	RM85.00	RM63.00
Allowance	RM900	RM800	RM0

3. Alternative ways:

i. Lecturers just receive the payment by bank transfer without well documented.

ii. Lecturers have to check their salary with digital access by using the information that prepared and insert their detailed information as well.

iii. Lecturers check their salary and print out the pay slip.

4. Best way(2):

The best way to solve this problem is way (ii). This is because, the data input process for the lecturer's payment will easier since the system used has digital access. Compared to way (i) and (iii), way (ii) will minimize the difficulties to use the payslip in future use. Furthermore, the financial data is recorded more clearly and it will prevent from loss and damage.

5. Instruction:

i. Lecturer have to enter their name, identification card number, work code and month of payslip.

ii. Lecturer insert an input such as hour of work, salary per hour and allowance for system save and calculate their salary based on details.

iii. System calculates the basic salary by use the formula:

basic salary = salary per hour*hour

iv. System calculates the amount of deduction by use the formula:

EPF= 0.1*basic salary

SOCSO=0.005*basic salary

amount of deduction= EPF+SOCSO

v. System calculates the net salary based on basic salary and amount of deduction

net salary = basic salary - amount of deduction

vi. System display the payslip contains their information and net salary.

6. Evaluate the solution

The solutions fulfil the requirement to solve the problem that have been stated. Lecturers must insert their information to system for process. First of all, the system will calculate basic salary based on salary per hour and hour of work. Next, system will calculate the amount of deduction by adding the amount of EPF and SOCSO together. Lastly, the system will calculate the net salary by deduct the basic salary with amount of deduction. Later, the system displays the lecturer's info and the wage's info on the payslip.

7. Algorithm

Basic Salary = (Salary per hour × hour) + Allowance

EPF = 0.1 × Basic salary

SOCSO = 0.005 × Basic salary

Amount of deduction = EPF + SOCSO

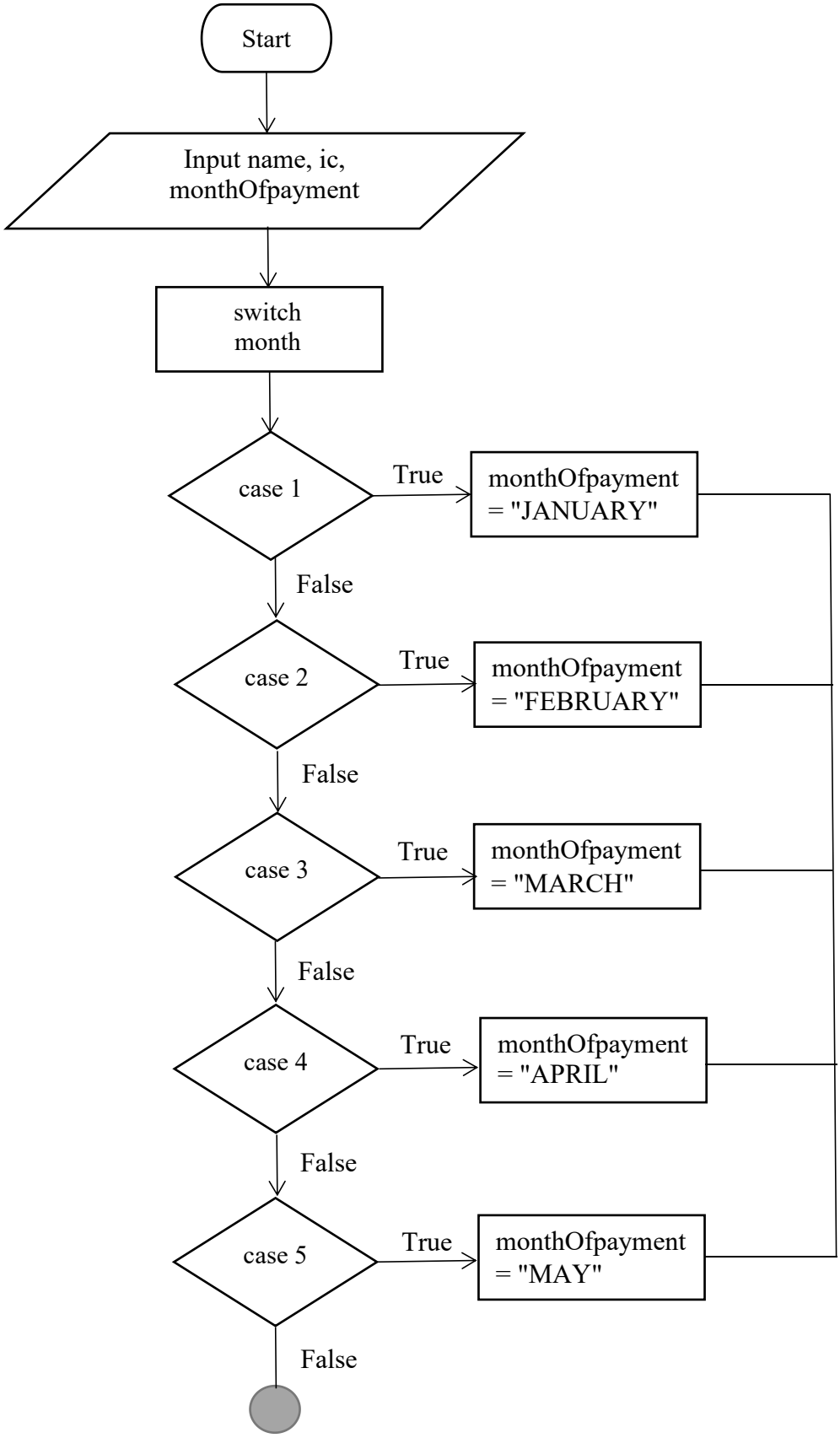
Net salary = Basic salary – Amount of deduction

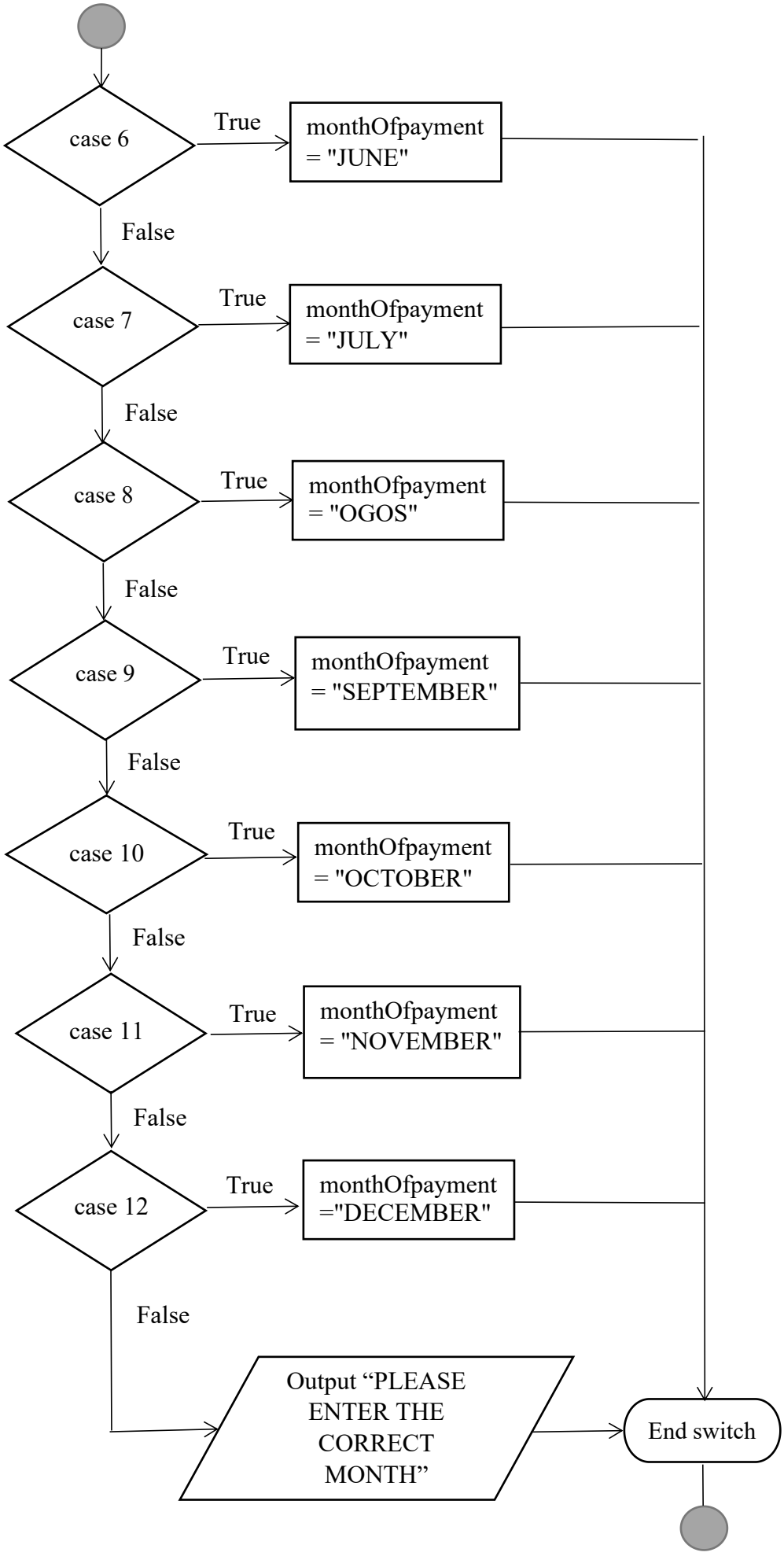
8. Pseudocode

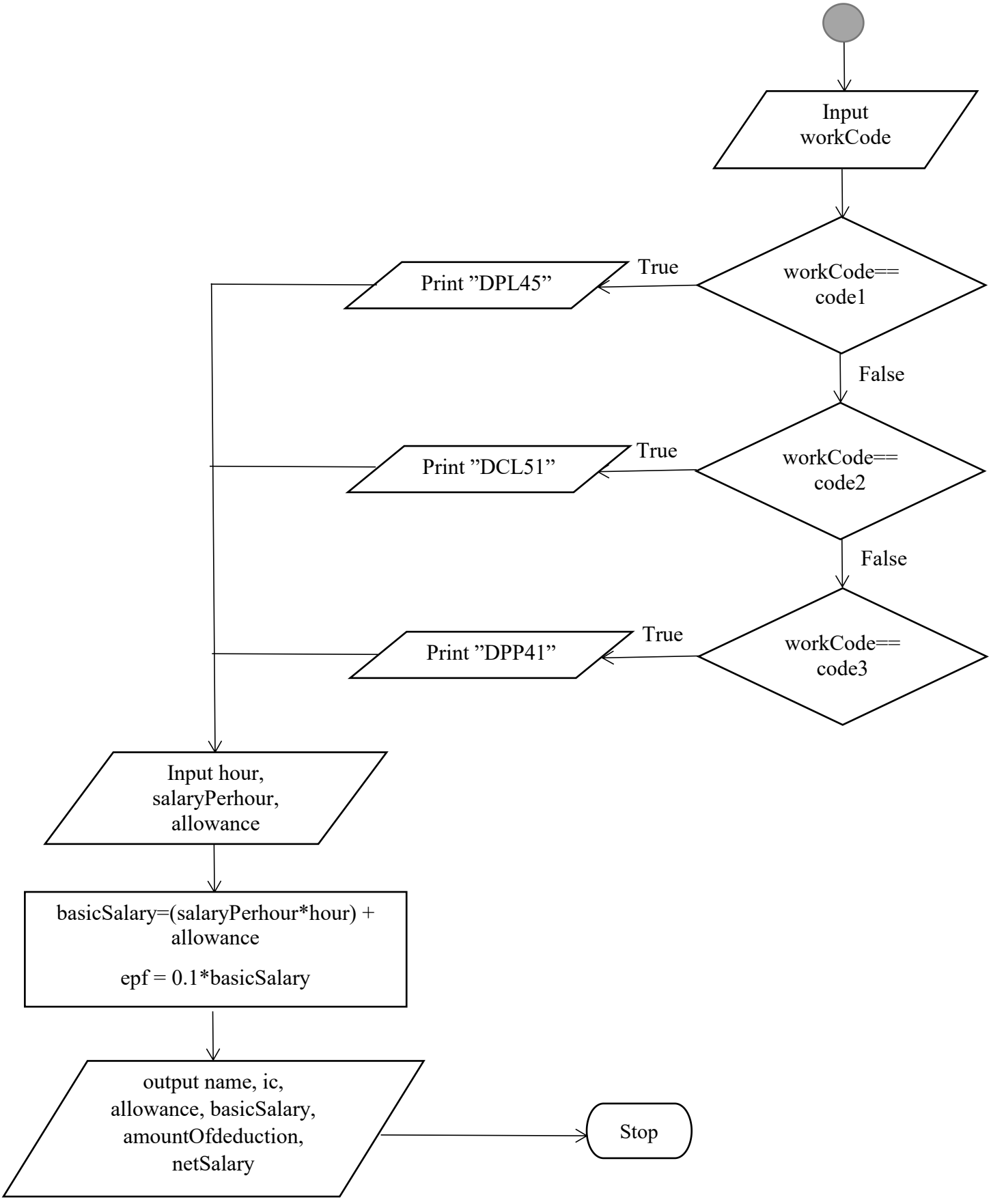
```
Start
        input name, ic
        Input monthOfpayment
        Case based on monthOfpayment
        Case switch (month)
        case 1
                monthOfpayment= "JANUARY"
                break
        case 2
                monthOfpayment= "FEBRUARY"
                break
        case 3:
                monthOfpayment= "MARCH"
                break
        case 4:
                monthOfpayment= "APRIL"
                break
        case 5:
                monthOfpayment= "MAY"
                break;
        case 6:
                monthOfpayment= "JUNE"
                break
        case 7:
                monthOfpayment= "JULY"
                break
        case 8:
                monthOfpayment= "OGOS"
                break
        case 9:
                monthOfpayment= "SEPTEMBER"
```

```
            break
        case 10:
            monthOfpayment= "OCTOBER"
            break
        case 11:
            monthOfpayment= "NOVEMBER"
            break
        case 12:
            monthOfpayment="DECEMBER"
            break
        default:
            Output “PLEASE ENTER THE CORRECT MONTH”
        endcase
        input workCode
        if (workCode==code1)
            Print ”DPL45”
        else if (workCode==code2)
            Print ”DCL51”
        else if (workCode==code3)
            Print ”DPP41”
        endif
        input hour, salaryPerhour, allowance
        basicSalary = (salaryPerhour*hour) + allowance
        epf = 0.1*basicSalary
        socso = 0.005*basicSalary
        amountOfdeduction = epf+socso
        netSalary = basicSalary-amountOfdeduction
        output name, ic, allowance, basicSalary, amountOfdeduction,
        netSalary
Stop
```

9. Flowchart


Start
Input name, ic, monthOfpayment
switch month
case 1
True
monthOfpayment = "JANUARY"
False
case 2
True
monthOfpayment = "FEBRUARY"
False
case 3
True
monthOfpayment = "MARCH"
False
case 4
True
monthOfpayment = "APRIL"
False
case 5
True
monthOfpayment = "MAY"
False


case 6
True
monthOfpayment = "JUNE"
False
case 7
True
monthOfpayment = "JULY"
False
case 8
True
monthOfpayment = "OGOS"
False
case 9
True
monthOfpayment = "SEPTEMBER"
False
case 10
True
monthOfpayment = "OCTOBER"
False
case 11
True
monthOfpayment = "NOVEMBER"
False
case 12
True
monthOfpayment ="DECEMBER"
False
Output “PLEASE ENTER THE CORRECT MONTH”
End switch


Input
workCode
workCode==
code1
True
Print ”DPL45”
False
workCode==
code2
True
Print ”DCL51”
False
workCode==
code3
True
Print ”DPP41”
Input hour,
salaryPerhour,
allowance
basicSalary=(salaryPerhour*hour) +
allowance
epf = 0.1*basicSalary
output name, ic,
allowance, basicSalary,
amountOfdeduction,
netSalary
Stop

10. CODING

```java
package assignment2;
import java.util.Scanner;
public class PaySlip {

    public static void main(String[] args) {
        // TODO Auto-generated method stub

        Scanner sc=new Scanner(System.in);
        String workCode="";
        String name;
        long ic;
        String monthOfpayment = null;
        int hour;
        int salaryPerhour;
        double netsalary;
        double basicSalary;
        double epf;
        double socso;
        double amountOfdeduction;
        double allowance;
        int month;
        String code1="DPL45";
        String code2="DCL51";
        String code3="DP441";
        String code;

        //user insert input
        System.out.println ("Enter your name:");
        name=sc.nextLine();
        System.out.println ("Enter your identification card number:");
        ic=sc.nextLong();
        System.out.println ("Enter the month of payslip you want:");
        month=sc.nextInt();

        switch (month) {
        case 1:
            monthOfpayment= "JANUARY";
            break;
        case 2:
            monthOfpayment= "FEBRUARY";
            break;
        case 3:
            monthOfpayment= "MARCH";
            break;
        case 4:
            monthOfpayment= "APRIL";
            break;
        case 5:
            monthOfpayment= "MAY";
            break;
        case 6:
            monthOfpayment= "JUNE";
            break;
        case 7:
            monthOfpayment= "JULY";
            break;
        case 8:
            monthOfpayment= "OGOS";
            break;
        case 9:
            monthOfpayment= "SEPTEMBER";
            break;
        case 10:
            monthOfpayment= "OCTOBER";
            break;
        case 11:
            monthOfpayment= "NOVEMBER";
            break;
        case 12:
            monthOfpayment="DECEMBER";
            break;
        default:
            System.out.println ("PLEASE ENTER THE CORRECT MONTH");
            System.exit(0);

        }
```

```
        System.out.println ("Enter your work code:");
        workCode=sc.next();
        if (workCode==code1) {
            code="DPL45";
        }
        else if (workCode==code2) {
            code="DCL51";
        }
        else if (workCode==code3) {
            code="DP441";
        }

        //earnings
        System.out.println ("Enter your hour of work for this month:");
        hour=sc.nextInt();
        System.out.println ("Enter your salary per hour:");
        System.out.print ("RM");
        salaryPerhour=sc.nextInt();
        System.out.println ("Enter your allowance");
        System.out.print ("RM");
        allowance=sc.nextDouble();

        //calculate the basic salary
        basicSalary=(salaryPerhour*hour)+allowance;

        //deductions
        //calculate the EPF and SOCSO
        epf=0.1*basicSalary;
        socso=0.005*basicSalary;
        amountOfdeduction=epf+socso;

        //calculate the net salary
        netsalary=basicSalary-amountOfdeduction;


        System.out.println("*****************************************************************************************");
        System.out.println("                PAYSLIP "+ monthOfpayment + ", 2021");
        System.out.println("*****************************************************************************************");
        System.out.println ("NAME: "+name + "                    WORK CODE: "+workCode);
        System.out.println ("NRIC NO: "+ic);
        System.out.println ();
        System.out.printf ("===EARNINGS===");
        System.out.println ();
        System.out.printf ("BASIC SALARY: RM%.2f",basicSalary);
        System.out.println ();
        System.out.printf ("ALLOWANCE: RM%.2f", allowance);
        System.out.println ("\n");
        System.out.printf ("===DEDUCTION===");
        System.out.println ();
        System.out.printf ("EPF: RM%.2f",epf);
        System.out.println ();
        System.out.printf ("SOCSO: RM%.2f",socso);
        System.out.println ();
        System.out.printf ("AMOUNT OF DEDUCTION: RM%.2f",amountOfdeduction);
        System.out.println ();
        System.out.println("*****************************************************************************************");
        System.out.printf ("    NET SALARY: RM%.2f",netsalary);
        System.out.println ();
        System.out.println("*****************************************************************************************");

        sc.close();
    }
```

OUTPUT

```
Enter your name:
HARUN BIN MUSTAFA
Enter your identification card number:
9876543210
Enter the month of payslip you want:
11
Enter your work code:
DCL51
Enter your hour of work for this month:
37
Enter your salary per hour:
RM85
Enter your allowance
RM800
*****************************************************************************************
                              PAYSLIP NOVEMBER, 2021
*****************************************************************************************
NAME: HARUN BIN MUSTAFA                              WORK CODE: DCL51
NRIC NO: 9876543210

===EARNINGS===
BASIC SALARY: RM3945.00
ALLOWANCE: RM800.00

===DEDUCTION===
EPF: RM394.50
SOCSO: RM19.73
AMOUNT OF DEDUCTION: RM414.23
*****************************************************************************************
        NET SALARY: RM3530.78
*****************************************************************************************
```

TOPIC STUDENT- NUR ALYA BINTI MOHD IZAZI

1. Identify the problem

Universities in Malaysia are often become the choice of students from abroad to pursue their studies because of the quality of teaching provided and also well-experience lecturers who teach at universities. Not only that most international students decided to pursue their studies at university in Malaysia because of the facilities provided starting from transportation facilities that help students to move from one place to another, internet network facilities, library services for students to review lessons, comfortable lecture halls, sophisticated devices and comfortable accommodation for students.

2. Understand the problem

Students who are decided to stay at the residential college in the university are required to pay for the room fee. For the students that are Malaysian, they are allow to choose between two college which is Syed Residential College and Zain Residential College. For the international students they can only choose Syed Residential College. Syed Residential College's room give the student more benefit from the facility that are provided meanwhile Zain Residential College's room provided the students the normal facility. The price for the Syed Residential's room is three time more expensive than Zain Residential College's room Discounts 80% will be given to the students who are active in the university activities by getting mark more than 70. Write a programme that will show the balance fee of Residential College that student need to pay based on the type of Residential College that were chosen and the student's co-curriculum mark.

Achievement	Category	Mark
Participation on residential college	**chairman**	**12**
	Deputy chairman	**10**

organization	**Secretary**	**8**
	Treasurer	**8**
	Committee member	**6**
Participation on university organization	**Chairman**	**15**
	Deputy chairman	**13**
	Secretary	**10**
	Treasurer	**10**
	Committee member	**8**
Excelled in academic	**CGPA 3.5 – 4.0**	**10**
Involvement in university club organization	**Chairman**	**10**
	Deputy chairman	**8**
	Secretary	**7**
	Treasurer	**7**
	Committee member	**5**
	participants	**3**
Involvement in university sport day	**Chairman**	**8**
	Deputy chairman	**7**
	Secretary	**6**
	Treasurer	**6**
	Committee member	**4**
	participants	**2**
Participation in university activity	**International level**	**10**
	National level	**8**
	University level	**7**

3. Alternative Method

(i)Write a program that can calculate the balance fee based on the total co-curriculum mark and college name.

(ii)Lecturer have to calculate manually balance fee that student need to pay based on the total co-curriculum mark and college name and send the details through email to the students.

4. Best Way

The best way to solve this problem is by using number (i) method. Number (i) method help the lecturer to manage student payment matter easier and can save more time than using number (ii) method.

5. Instructions

1. Key in the student information and details and key in whether the student is from Malaysia or the student is an international student.

2. The program will give the option for the students who are from Malaysia to choose between Zain Residential College or Syed Residential College.

3. For the international student the program will only give student one option which is Syed Residential College and the current balance fee will be calculated.

4. Key in the student total co-curriculum mark based on the achievement and category.

5. The program will calculate the residential college fee after discount for the students who get a mark more than 70.

    (when key in Zain Residential College)

    balanceFee=(collegeFee*1)

    balanceFee=(balanceFee*0.2)

    (when key in Syed Residential College)

    balanceFee=(collegeFee*3)

    balanceFee= (balanceFee *0.2)

6. The program will directly show the residential college fee for the student who get mark less than 70.

   balanceFee= collegeFee (when key in Zain Residential College)

   balanceFee= (collegeFee*3) (when key in Syed Residential College)

7. The system will print out the student details, total co-curriculum mark and balance fee.

6. Evaluate the Solution

The solution meets the requirement to solve the problems stated. The balance fee of Residential College that student need to pay is calculated based on the college name and the total of co-curriculum mark. The calculation of the balance Fee will begin when student key in their college name that are choose and total co-curriculum mark. The system will print out the student's detail, the college name that are chosen, the total co-curriculum mark and the balance fee.

7. Algorithm

If choose A and get mark more than 70:

balanceFee = (collegeFee*3)

balanceFee = (balanceFee * 0.2)

if choose A and get mark less than 70:

balanceFee = (collegeFee*3)

if choose B and get mark more than 70:

balanceFee = (collegeFee)

balanceFee = (balanceFee * 0.2)

if choose B and get mark less than 70:

balanceFee = (collegeFee)

8. Pseudocode

Start

Initialize loop = 1

Declare name, countryName = “Malaysia”, sem, choice3, choice4,

totalCocumark, balance Fee, collegeFee = 160.99

while loop =1

Output “Please key in your name: “

Input name

Output “Please key in what semester are you now: “

Input sem

Output “Please key in your country name: “

Input countryName

If (countryName.equals(“Malaysia”)

Output “Please key in your choice: “

Input choice

If(choice3 == ‘A’)

Display balanceFee=(collegeFee*3)

Else

Display balanceFee=(collegeFee)

Output “Please key in your total cocurriculum mark:”

Input totalCocumark

If(totalCocuMark>70)

Display balanceFee=(collegeFee*3)

balanceFee=(balanceFee*0.2)

else

Display balanceFee=(collegeFee)

balanceFee=(balanceFee*0.2)

else if

Display balanceFee=(collegeFee*3)

Display balanceFee=collegeFee

end if

end if

endWhile

Display name

Display sem

Display countryName

    Display choice

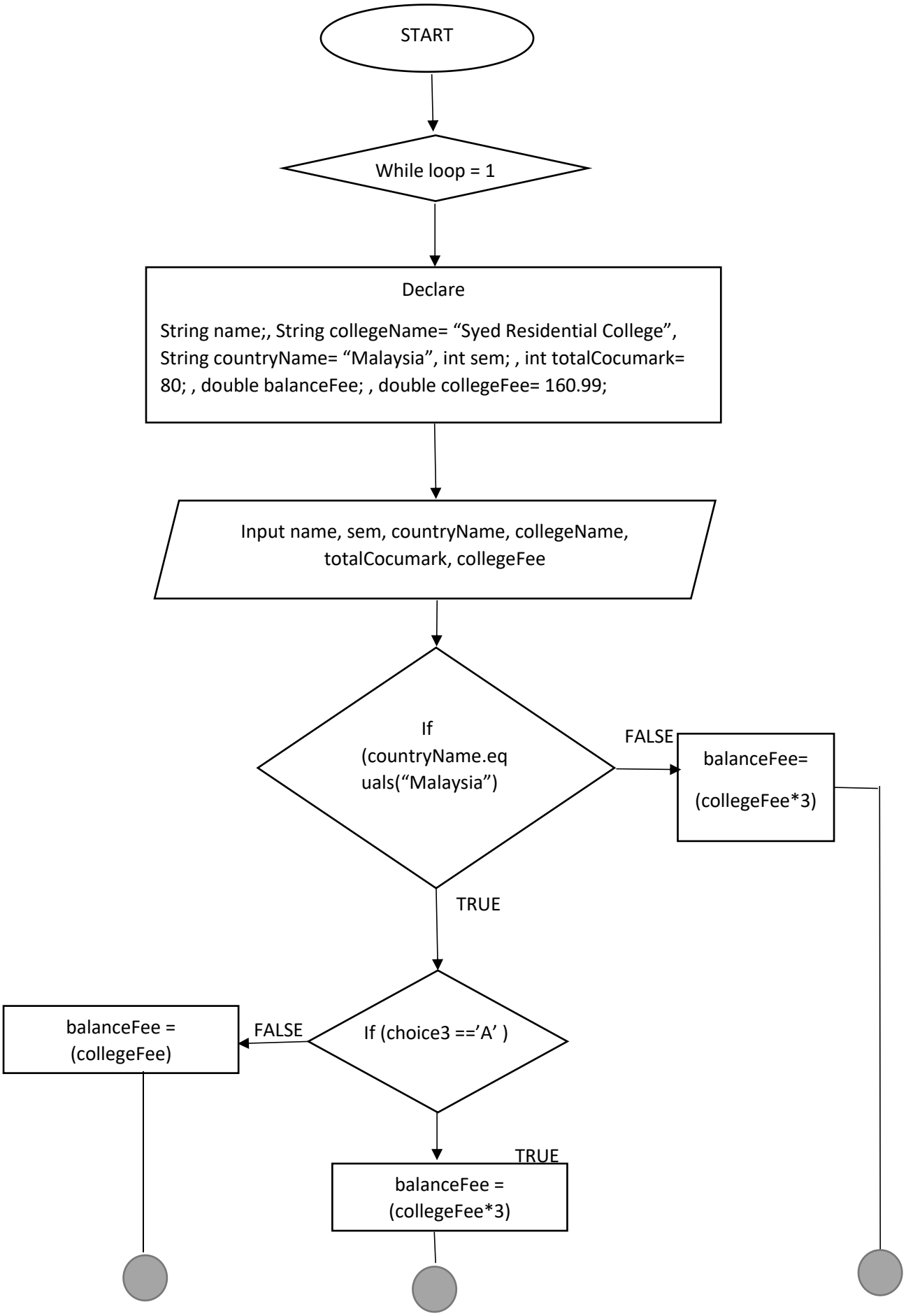
    Display totalCocuMark

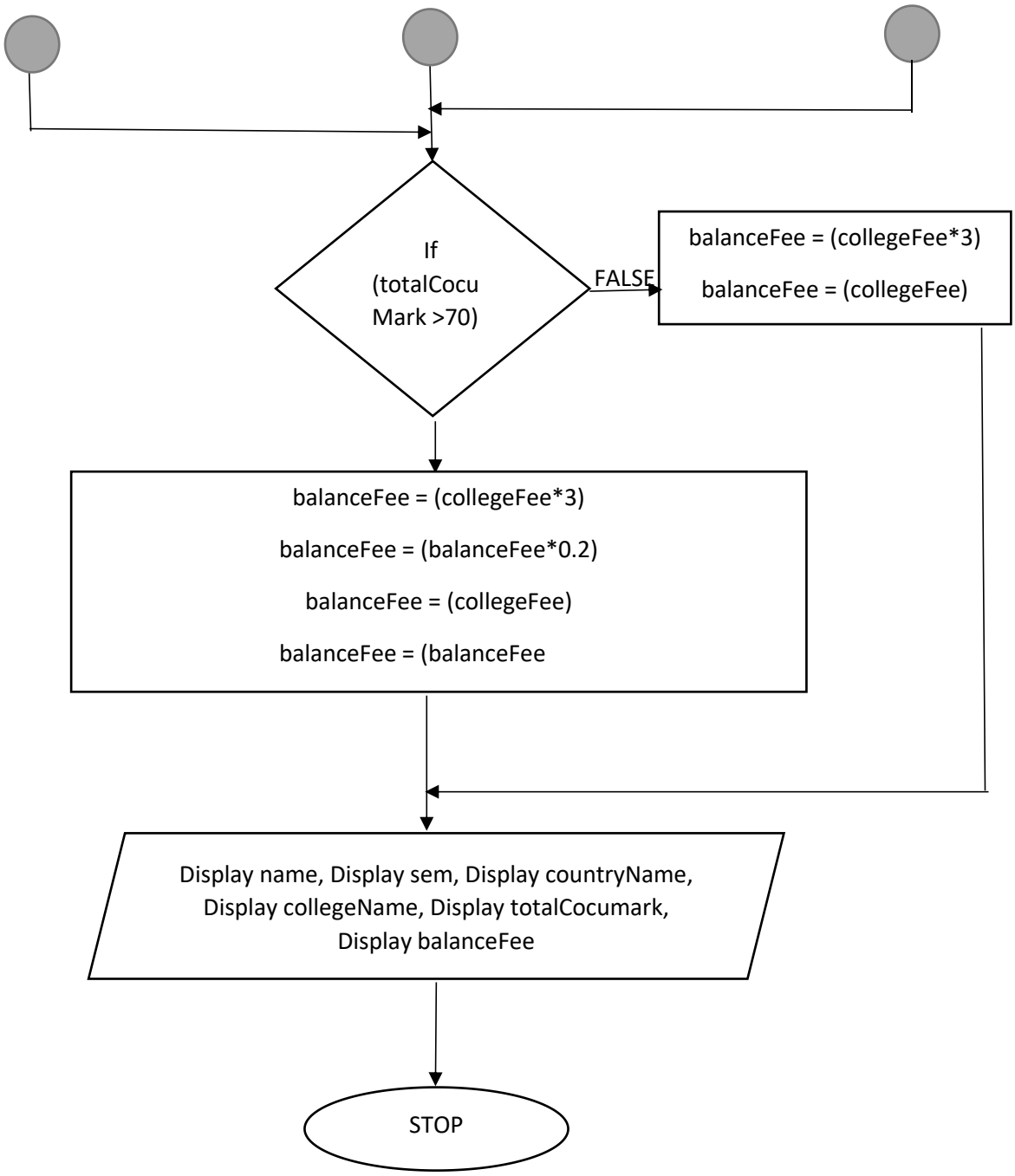
    Display balanceFee

Output “balance fee.”

End

9. Flowchart


START
While loop = 1
Declare
String name;, String collegeName= “Syed Residential College”, String countryName= “Malaysia”, int sem; , int totalCocumark= 80; , double balanceFee; , double collegeFee= 160.99;
Input name, sem, countryName, collegeName, totalCocumark, collegeFee
If (countryName.equals(“Malaysia”)
FALSE
balanceFee= (collegeFee*3)
TRUE
If (choice3 ==’A’)
FALSE
balanceFee = (collegeFee)
TRUE
balanceFee = (collegeFee*3)


If
(totalCocu
Mark >70)
FALSE
balanceFee = (collegeFee*3)
balanceFee = (collegeFee)
balanceFee = (collegeFee*3)
balanceFee = (balanceFee*0.2)
balanceFee = (collegeFee)
balanceFee = (balanceFee
Display name, Display sem, Display countryName,
Display collegeName, Display totalCocumark,
Display balanceFee
STOP

10.Coding

```java
package Topic_University;
import java.util.Scanner;
public class studentAlya {

    public static void main(String[] args) {
        // TODO Auto-generated method stub
        Scanner sc = new Scanner (System.in);

        String name;
        String countryName = "Malaysia";
        char choice3 = 'A';
        char choice4 = 'B';
        int sem;
        int totalCocuMark;
        double balanceFee;
        double collegeFee = 160.99;

        int loop=1;

        while (loop!=0){

            System.out.println("Please key in your name:");
            name = sc.next();
            System.out.println("Please key in what semester are you now:");
            sem = sc.nextInt();

            System.out.println("Please key in your country name:");
            countryName = sc.next();


            if (countryName.equals("Malaysia")){

                System.out.println("*****************************************************************************************************************");
                System.out.println();
                System.out.println(" For Malaysian students you may choose between two type of residential college.");
                System.out.println(" A. Syed Residential College");
                System.out.println(" B. Zain Residential College");
                System.out.println();
                System.out.println("Please key in your choice by stating 'A' or 'B' based on the residential college in the next question");
                System.out.println();
                System.out.println("*****************************************************************************************************************");

              System.out.println("Please key in your choice:");
              choice3 = sc.next().charAt(0);

             if(choice3 == 'A'){
                 balanceFee = (collegeFee*3);
                 System.out.println("Your current balance fee is: " +balanceFee);

                 System.out.println("*****************************************************************************************");
                 System.out.println();
                 System.out.println("Discount 80% will be given for student who are active in co-curriculum");
                 System.out.println("Students who have successfully achieve 70 mark and above in their co-curriculum will get the discount");
                 System.out.println();
                 System.out.println("*****************************************************************************************");

                 System.out.println("Please key in your total co-curriculum mark : ");
                 totalCocuMark = sc.nextInt();

             if(totalCocuMark > 70){
                 balanceFee = (collegeFee*3);
                 balanceFee = (balanceFee*0.2);
                 System.out.println("Please key in your total co-curriculum mark: " +totalCocuMark);
                 System.out.printf("The balance fee that you need to pay is: %.2f\n" ,balanceFee);

                 System.out.println("-------------------------------------------------------------------");
                 System.out.println();
                 System.out.println("Student's Details");
                 System.out.println("Name: \t \t \t \t" +name);
                 System.out.println("Semester: \t \t \t" +sem);
                 System.out.println("Country name: \t \t \t" +countryName);
                 System.out.println("College Residential choice: \t \t" +choice3);
                 System.out.println("Total Co-curriculum Mark: \t \t" +totalCocuMark);
                 System.out.printf("Total Balance Fee: \t \t \t%.2f" ,balanceFee);
                 System.out.println();
                 System.out.println("-------------------------------------------------------------------");
             }
              else {
              balanceFee = (collegeFee*3);
              System.out.println("The balance fee that you need to pay is: " +balanceFee);

              System.out.println("-------------------------------------------------------------------");
              System.out.println();
              System.out.println("Student's Details");
              System.out.println("Name: \t \t \t \t" +name);
              System.out.println("Semester: \t \t \t" +sem);
              System.out.println("Country name: \t \t \t" +countryName);
              System.out.println("College Residential choice: \t \t" +choice3);
              System.out.println("Total Co-curriculum Mark: \t \t" +totalCocuMark);
```

```
            System.out.println("Total Balance Fee: \t \t \t" +balanceFee);
            System.out.println();
            System.out.println("-------------------------------------------------------------------");
           }

        }
            else if(choice3 != 'A'){
              balanceFee = collegeFee;
              System.out.println("Your current balance fee is: " +balanceFee);

              System.out.println("*************************************************************************************************");
              System.out.println();
              System.out.println("Discount 80% will be given for student who are active in co-curriculum");
              System.out.println("Students who have successfully achieve 70 mark and above in their co-curriculum will get the discount");
              System.out.println();
              System.out.println("*************************************************************************************************");


              System.out.println("Please key in your total co-curriculum mark : ");
              totalCocuMark = sc.nextInt();

         if (choice3 !='A' && totalCocuMark > 70){
            balanceFee = (collegeFee);
            balanceFee = (collegeFee * 0.2);
            System.out.printf("The balance fee that you need to pay is: %.2f\n" ,balanceFee);

            System.out.println("-------------------------------------------------------------------");
            System.out.println();
            System.out.println("Student's Details");
            System.out.println("Name: \t \t \t \t" +name);
            System.out.println("Semester: \t \t \t" +sem);
            System.out.println("Country name: \t \t \t" +countryName);
            System.out.println("College Residential choice: \t \t" +choice4);
            System.out.println("Total Co-curriculum Mark: \t \t" +totalCocuMark);
            System.out.printf("Total Balance Fee: \t \t \t%.2f" ,balanceFee);
            System.out.println();
            System.out.println("-------------------------------------------------------------------");
         }
         else {
            balanceFee = (collegeFee);
            System.out.println("The balance fee that you need to pay is: " +balanceFee);

            System.out.println("-------------------------------------------------------------------");
            System.out.println();
    System.out.println("Student's Details");
    System.out.println("Name: \t \t \t \t" +name);
    System.out.println("Semester: \t \t \t" +sem);
    System.out.println("Country name: \t \t \t" +countryName);
    System.out.println("College Residential choice: \t \t" +choice4);
    System.out.println("Total Co-curriculum Mark: \t \t" +totalCocuMark);
    System.out.println("Total Balance Fee: \t \t \t" +balanceFee);
    System.out.println();
    System.out.println("-------------------------------------------------------------------");
   }
}

    System.out.println("Do you wish to continue? Click any number to continue and click 0 to stop");
    loop = sc.nextInt();
        }


  else{
   System.out.println("*************************************************************************************************");
   System.out.println();
   System.out.println("For students who are not Malaysian/International Students you only given one choices of your college which is Syed Residential College");
   System.out.println();
   System.out.println("*************************************************************************************************");
   System.out.println();
   System.out.println(" Your choice data has been recorded.");
   balanceFee = (collegeFee*3);
   System.out.println("Your current balance fee is: " +balanceFee);

   System.out.println("*************************************************************************************************");
   System.out.println();
   System.out.println("Discount 80% will be given for student who are active in co-curriculum");
   System.out.println("Students who have successfully achieve 70 mark and above in their co-curriculum will get the discount");
   System.out.println();
   System.out.println("*************************************************************************************************");

   System.out.println("Please key in your total co-curriculum mark : ");
   totalCocuMark = sc.nextInt();

if(choice3 =='A' && totalCocuMark > 70){
    balanceFee = (collegeFee*3);
    balanceFee = (balanceFee*0.2);
    System.out.println("Please key in your total co-curriculum mark: " +totalCocuMark);
    System.out.printf("The balance fee that you need to pay is: %.2f\n" ,balanceFee);

            System.out.println("-------------------------------------------------------------------");
            System.out.println();
            System.out.println("Student's Details");
            System.out.println("Name: \t \t \t \t" +name);
            System.out.println("Semester: \t \t \t" +sem);
            System.out.println("Country name: \t \t \t" +countryName);
            System.out.println("College Residential choice: \t \t" +choice3);
            System.out.println("Total Co-curriculum Mark: \t \t" +totalCocuMark);
            System.out.printf("Total Balance Fee: \t \t \t%.2f" ,balanceFee);
            System.out.println();
            System.out.println("-------------------------------------------------------------------");
                  }
                System.out.println("Do you wish to continue? Click any number to continue and click 0 to stop");
                  loop = sc.nextInt();
                }
                  }

    }

}
```

OUTPUT

```
Please key in your name:
LEEKNOW
Please key in what semester are you now:
2
Please key in your country name:
KOREA
*****************************************************************************************************

For students who are not Malaysian/International Students you only given one choices of your college which is Syed Residential College

*****************************************************************************************************

 Your choice data has been recorded.
Your current balance fee is: 482.97
*****************************************************************************************************

Discount 80% will be given for student who are active in co-curriculum
Students who have successfully achieve 70 mark and above in their co-curriculum will get the discount

*****************************************************************************************************
Please key in your total co-curriculum mark :
87
Please key in your total co-curriculum mark: 87
The balance fee that you need to pay is: 96.59
-----------------------------------------------------------------

Student's Details
Name:                                   LEEKNOW
Semester:                               2
Country name:                           KOREA
College Residential choice:             A
Total Co-curriculum Mark:               87
Total Balance Fee:                      96.59
-----------------------------------------------------------------
Do you wish to continue? Click any number to continue and click 0 to stop
0
```

TOPIC COURSE – TANG WEI CHIANG

1. Identify the problem

A course is a syllabus item offered by the University that's similar to a subject that we may have studied at school. We undertake courses to complete our own program requirements. Courses are identified by a subject area and catalogue number, for example CHEM 1101 is a level 1 Chemistry course. Within each course there will be classes that you enrol into, for example lectures, tutorials, seminars or practical.

In higher education in various countries, such as Canada, Nigeria and the United States, a course is a unit of teaching that typically lasts one academic term, is led by one or more instructors (teachers or professors) and has a fixed roster of students. A course usually covers an individual subject. Courses generally have a fixed program of sessions every week during the term, called lessons or classes. Students may receive a grade and academic credit after completion of the course.

In India, the United Kingdom, Australia, and Singapore, as well as parts of Canada, a course is the entire programme of studies required to complete a university degree, and the word "unit" or "module" would be used to refer to an academic course as used in North America and the rest of Europe. This corresponds roughly to an academic major in the United States system.

In South Africa, a course is officially the collection of all courses (in the American sense, these are often called "modules") over a year or semester, though the American usage is common. In the Philippines, a course can be an individual subject (usually referred to by faculty and school officials) or the entire programme (usually referred to by students and outsiders).

Courses are time-limited in most universities worldwide, lasting anywhere between several weeks to several semesters. They can either be compulsory material or "elective". An elective is usually not a required course, but there are a certain number of non-specific electives that are required for certain majors.

2. Understand the problem

Universiti Utara Malaysia (UUM) aka Northern University of Malaysia, which was officially established on 16 February 1984, is the sixth Malaysian public university. UUM consists of two campuses, which is Sintok campus and Kuala Lumpur. UUM divided the college variety into three parts, which is College of Business, College of Arts and Sciences, and College of Law, Government and International Studies. Each college consists of several school. In School of Computing under College of Arts and Sciences, students will undergo course registration in every new semester given a certain period. When students want to register a second-level course, the course requires prerequisite course to register. Means that students want to register course A, they are going to complete course B with requirement, where students need to pass the grade with a minimum of GPA 2.00 and attendance rate of 80% or higher. The GPA will be calculated by using the marks from tests (80%) and coursework (20%). The total attend times for a course is 20. There would be certain course which require more than one prerequisite course, but the passing grade and attendance rate are the same. If student failed to reach the requirements of the secondary-level course they want to register, they are required to retake the prerequisite course until they fulfil the course requirements.

MARKS	GRADE POINT	
90 - 100	4.00	(Excellent)
80 - 89	4.00	(Excellent)
75 - 79	3.67	(Good)
70 - 74	3.33	(Good)
65 - 69	3.00	(Good)
60 - 64	2.67	(Satisfactory)
55 - 59	2.33	(Satisfactory)
50 - 54	2.00	(Pass)
45 - 49	1.67	(Fail)
40 - 44	1.33	(Fail)
35 - 39	1.00	(Fail)

0 - 34	0.00	(Fail)
0	0.00	(Barred)
0	0.00	(Withdraw)

Minimum passing GPA

Attended Times	Total Attend Times	Attendance Rate (%)
20	20	100
19	20	95
18	20	90
17	20	85
16	20	80
15	20	75
14	20	70
13	20	65
12	20	60
11	20	55
10	20	50
9	20	45
8	20	40
7	20	35
6	20	30
5	20	25
4	20	20

3	20	15
2	20	10
1	20	5
0	20	0

Minimum attendance rate

3. Alternative method

i. A system that can both calculate GPA using test mark and coursework mark, calculate attendance rate using attended time and total attend times.

ii. Develop an add drop system

iii. Develop a CGPA calculating system

4. Best method

The (i.) way is the best method as it fulfilled the problem stated where calculation of GPA using tests mark and coursework mark and calculation of attendance rate using attended time and total attended time. The (ii.) way wasn't clear to solve the problem as it only stated to add and drop something. The (iii.) way also didn't solve the problem as it calculate CGPA where only GPA are required in the problem stated.

5. Instructions

i. Get personal info from user (name, id, sem)

ii. Get user about course information (registeredCourse, testMark, courseworkMark, attendedTimes)

iii. Get the scdLvlCourse, display the course requirements (Completed prerequisite course required with minimum GPA 2.00 and attendance rate 80% or higher)

iv. Calculate test mark (Test 1 + Test 2)

v. Calculate the total mark of registered course (testMark + courseworkMark)

vi. Display total mark and GPA

vii. Calculate the Attendance Rate (attendedTimes/totalAttendTimes)*100

viii. Display attendance rate

ix. Determine whether the registered course fulfils the requirements of second-level course. If fulfilled, move on to next registration. Else, retake the registered course.

6. Evaluate the solution

The solution meets the requirement to solve the problems stated. Firstly, the registered course tests mark and coursework mark is summed up into total mark. The total mark will be based on the grading table that determines the course GPA. Next, the system will also calculate the attendance rate of the registered course by student. As student has keyed in the number of attended times of registered course, the system will calculate the attendance rate using the data keyed in with the total attend times. And so, both the GPA and attendance rate of the registered course has been calculated and displayed, it will determined whether student is allowed to register the second-level course.

7. Algorithm

Tests Mark = Test 1 Mark + Test 2 Mark

Total Mark = Test Mark + Coursework Mark

Attendance rate = $\frac{Attended\ Times}{Total\ Attend\ Time} \times 100$

8. Pseudocode

```
START
    Declare regCourse, testMark1, testMark2, courseworkMark, totalMark,
    scdLvlCourse, attTime = n, totalAttTime = 20, minGPA = 2.00, GPA,
    minAttRate = 80, attRate.
    OUTPUT “REGISTERED COURSE”
    OUTPUT “How many course did you take in last sem?”
    OUTPUT “Number of registered course (max.3): ”
    INPUT number of registered course
    FOR(int i=2; i<course+1; i++)
    IF course<=3 THEN
    CASE switch(course)
    condition 1:
        OUTPUT “Enter registered course 1: ”
        INPUT registered course
        OUTPUT “Enter Test 1 Marks: ”
        INPUT Test 1 Marks
        OUTPUT “Enter Test 2 Marks: ”
        INPUT Test 2 Marks
        OUTPUT “Enter Coursework Marks: ”
        INPUT Coursework Marks
        tryAgain = false
        break
    condition 2:
        OUTPUT “Enter registered course 1: ”
        INPUT registered course
        OUTPUT “Enter Test 1 Marks: ”
        INPUT Test 1 Marks
        OUTPUT “Enter Test 2 Marks: ”
        INPUT Test 2 Marks
        OUTPUT “Enter Coursework Marks: ”
        OUTPUT “Enter registered course 2: ”
        INPUT registered course
        OUTPUT “Enter Test 1 Marks: ”
        INPUT Test 1 Marks
        OUTPUT “Enter Test 2 Marks: ”
        INPUT Test 2 Marks
        OUTPUT “Enter Coursework Marks: ”
        tryAgain = false
        break
    condition 3:
        OUTPUT “Enter registered course 1: ”
        INPUT registered course
        OUTPUT “Enter Test 1 Marks: ”
        INPUT Test 1 Marks
```

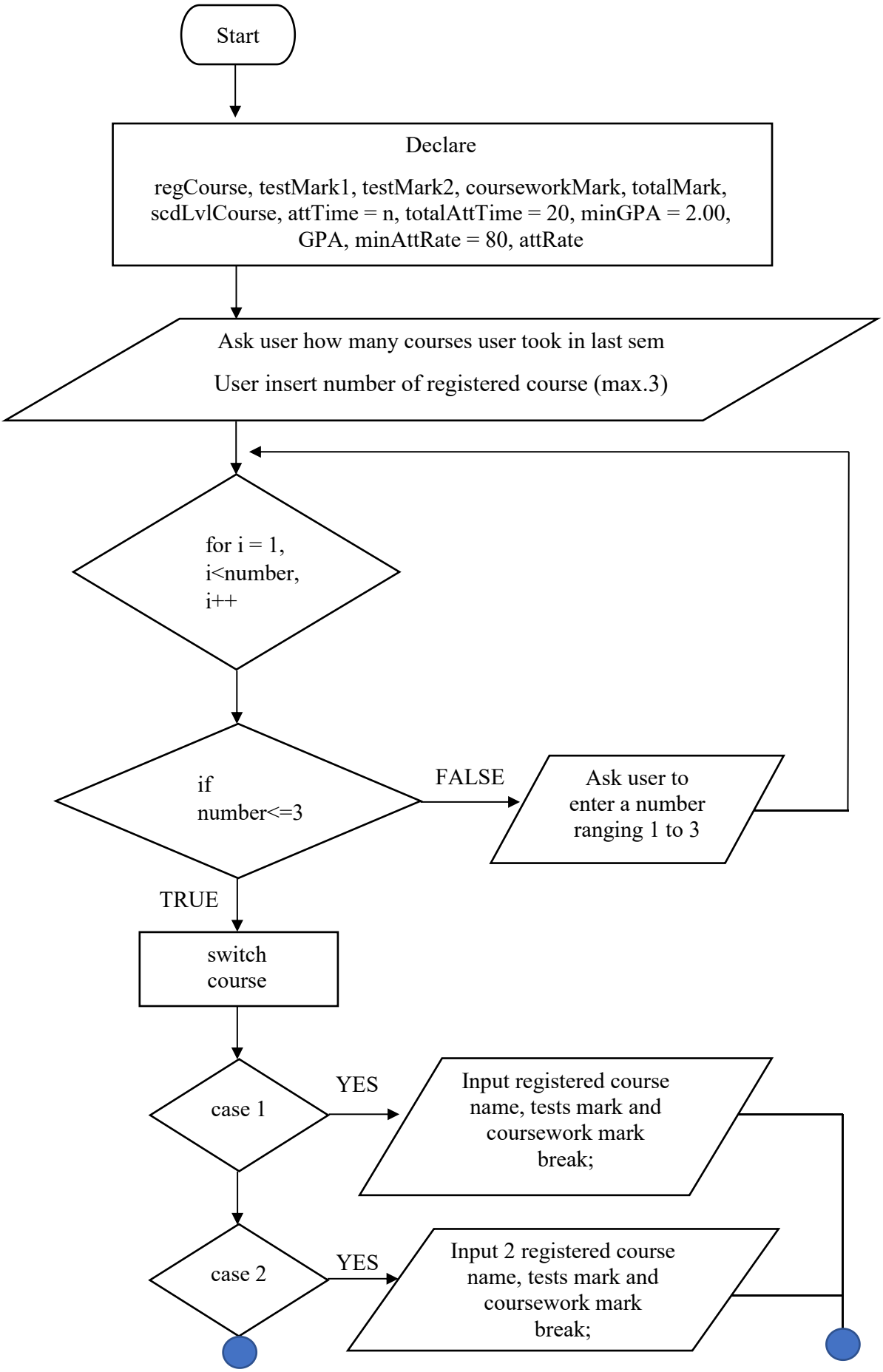
```
        OUTPUT “Enter Test 2 Marks: ”
        INPUT Test 2 Marks
        OUTPUT “Enter Coursework Marks: ”
        OUTPUT “Enter registered course 2: ”
        INPUT registered course
        OUTPUT “Enter Test 1 Marks: ”
        INPUT Test 1 Marks
        OUTPUT “Enter Test 2 Marks: ”
        INPUT Test 2 Marks
        OUTPUT “Enter Coursework Marks: ”
        OUTPUT “Enter registered course 3: ”
        INPUT registered course
        OUTPUT “Enter Test 1 Marks: ”
        INPUT Test 1 Marks
        OUTPUT “Enter Test 2 Marks: ”
        INPUT Test 2 Marks
        OUTPUT “Enter Coursework Marks: ”
        tryAgain = false
        break
OTHERS
END CASE
ELSE
        OUTPUT “Please enter a valid number (1-3).”
ENDFOR
course1 = STIA1123
course2 = STID3113
course3 = STQM2103
SET invalid = true
WHILE invalid
        OUTPUT “Enter the second-level course you want to register: ”
        OUTPUT ”Press:”
        OUTPUT “(1) STIA1123”
        OUTPUT “(2) STID3113”
        OUTPUT “(3) STQM2103”
        OUTPUT “Your answer: ”
        INPUT second-level course
CASE switch(scdLvlCourse)
condition 1:
        OUTPUT “STIA1123 requirements: ”
        OUTPUT “Completed STIA1113 with GPA 2.00 and attendance
rate
                        80% or above ”
        invalid = false
        break
condition 2:
        OUTPUT “STID3113 requirements: ”
```

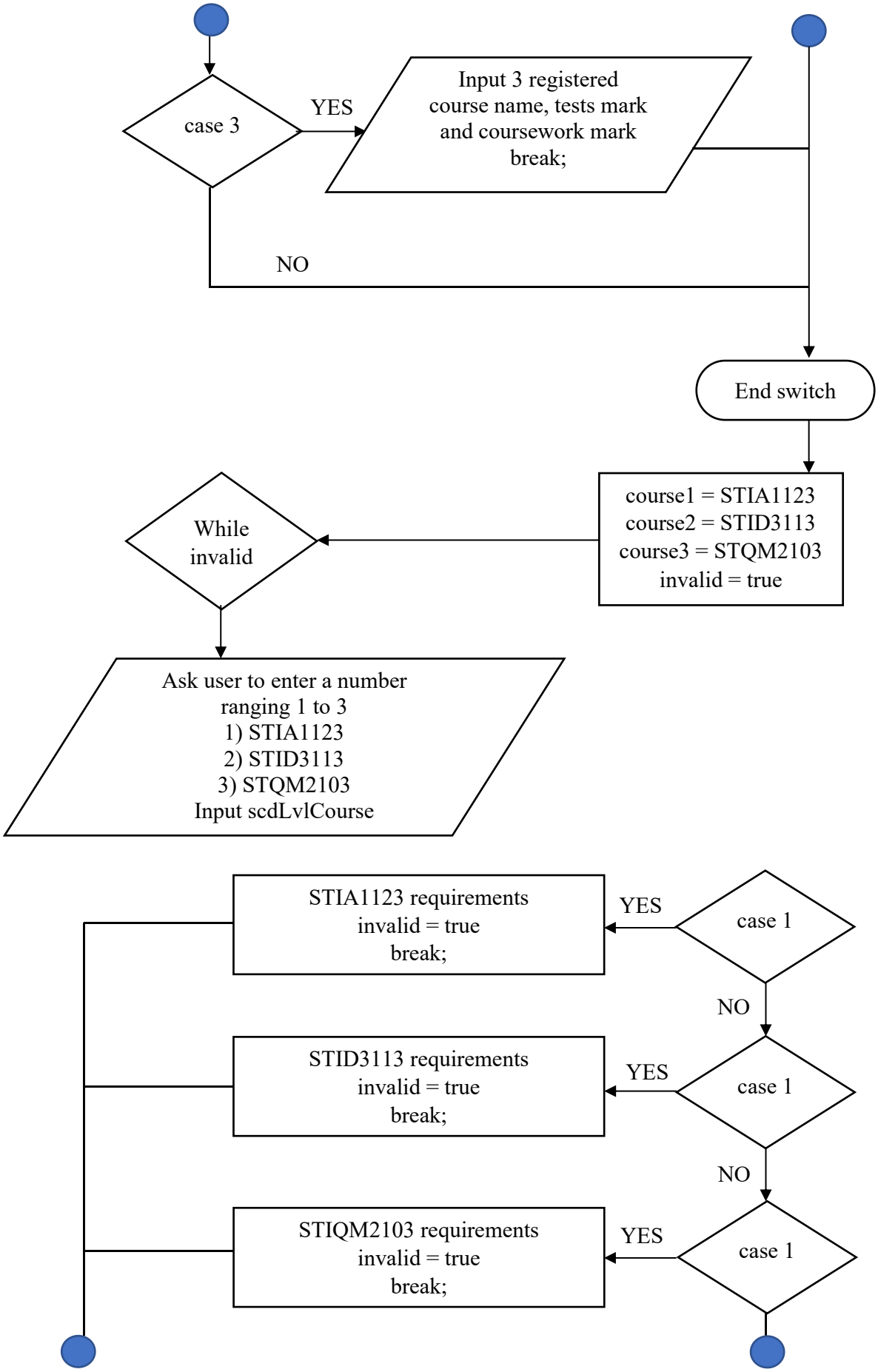
```
        OUTPUT “Completed STQS1023 with GPA 2.00 and attendance
rate
                        80% or above ”
        invalid = false
        break
condition 3:
        OUTPUT “STQM2103 requirements: ”
        OUTPUT “Completed STQM1203 with GPA 2.00 and attendance
rate
                        80% or above ”
        invalid = false
        break
OTHERS:
        OUTPUT “Invalid course”
        OUTPUT “Please re-enter a valid course”
ENDCASE
ENDWHILE
testsMark = testMark 1 + testMark2
totMark = testsMark + courseworkMark
attRate = (attTime / totalAttTime) * 100
IF totMark>=80 THEN
        GPA = 4.00
IF totMark>=75 AND totMark<=79 THEN
        GPA = 3.67
IF totMark>=70 AND totMark<=74 THEN
        GPA = 3.33
IF totMark>=65 AND totMark<=69 THEN
        GPA = 3.00
IF totMark>=60 AND totMark<=64 THEN
        GPA = 2.67
IF totMark>=55 AND totMark<=59 THEN
        GPA = 2.33
IF totMark>=50 AND totMark<=54 THEN
        GPA = 2.00
IF totMark>=45 AND totMark<=49 THEN
        GPA = 1.67
IF totMark>=40 AND totMark<=44 THEN
        GPA = 1.33
IF totMark>=35 AND totMark<=39 THEN
        GPA = 1.00
IF totMark<=34 THEN
        GPA = 0.00
OUTPUT registred course RESULT
IF scdLvlCourse = 1 THEN
OUTPUT registered course1 RESULT
OUTPUT Test 1
```

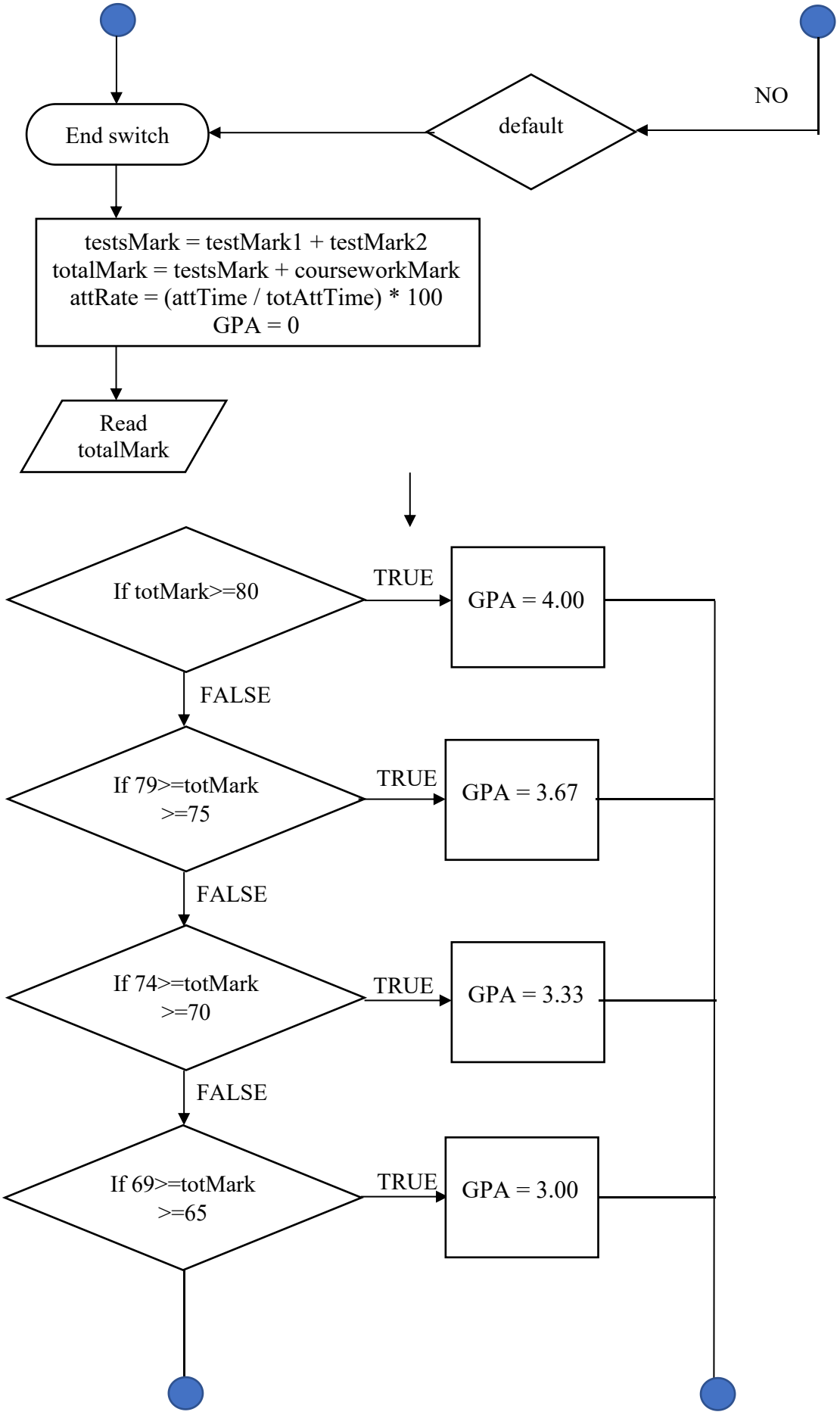
```
OUTPUT Test 2
OUTPUT Tests mark
OUTPUT Coursework marks
OUTPUT Total marks
OUTPUT GPA
OUTPUT Attended time
OUTPUT Total attend times needed
OUTPUT Attendance rate
OUTPUT second-level course REGISTRATION CONFIRMATION
IF GPA>=2.00 AND attRate>=80 THEN
        OUTPUT “You’ve passed the GPA and attendance rate
        requirements.”
        OUTPUT “second-level course registered successfully!”
IF GPA>=2.00 AND attRate>=80 THEN
        OUTPUT “You've passed the GPA requirement but failed to
        fulfilled
        attendance rate, please retake the course.”
IF GPA>=2.00 AND attRate>=80 THEN
        OUTPUT “You've passed the attendane rate requirement but
        failed to
        fulfilled GPA, please retake the course.”
DEFAULT
        OUTPUT “"You've failed both GPA and attendance rate
        requirements,
        please retake the course.”
ELSE IF scdLvlCourse = 2 THEN
OUTPUT registered course2 RESULT
OUTPUT Test 1
OUTPUT Test 2
OUTPUT Tests mark
OUTPUT Coursework marks
OUTPUT Total marks
OUTPUT GPA
OUTPUT Attended time
OUTPUT Total attend times needed
OUTPUT Attendance rate
OUTPUT second-level course REGISTRATION CONFIRMATION
IF GPA>=2.00 AND attRate>=80 THEN
        OUTPUT “You’ve passed the GPA and attendance rate
        requirements.”
        OUTPUT “second-level course registered successfully!”
IF GPA>=2.00 AND attRate>=80 THEN
        OUTPUT “You've passed the GPA requirement but failed to
        fulfilled
        attendance rate, please retake the course.”
IF GPA>=2.00 AND attRate>=80 THEN
```

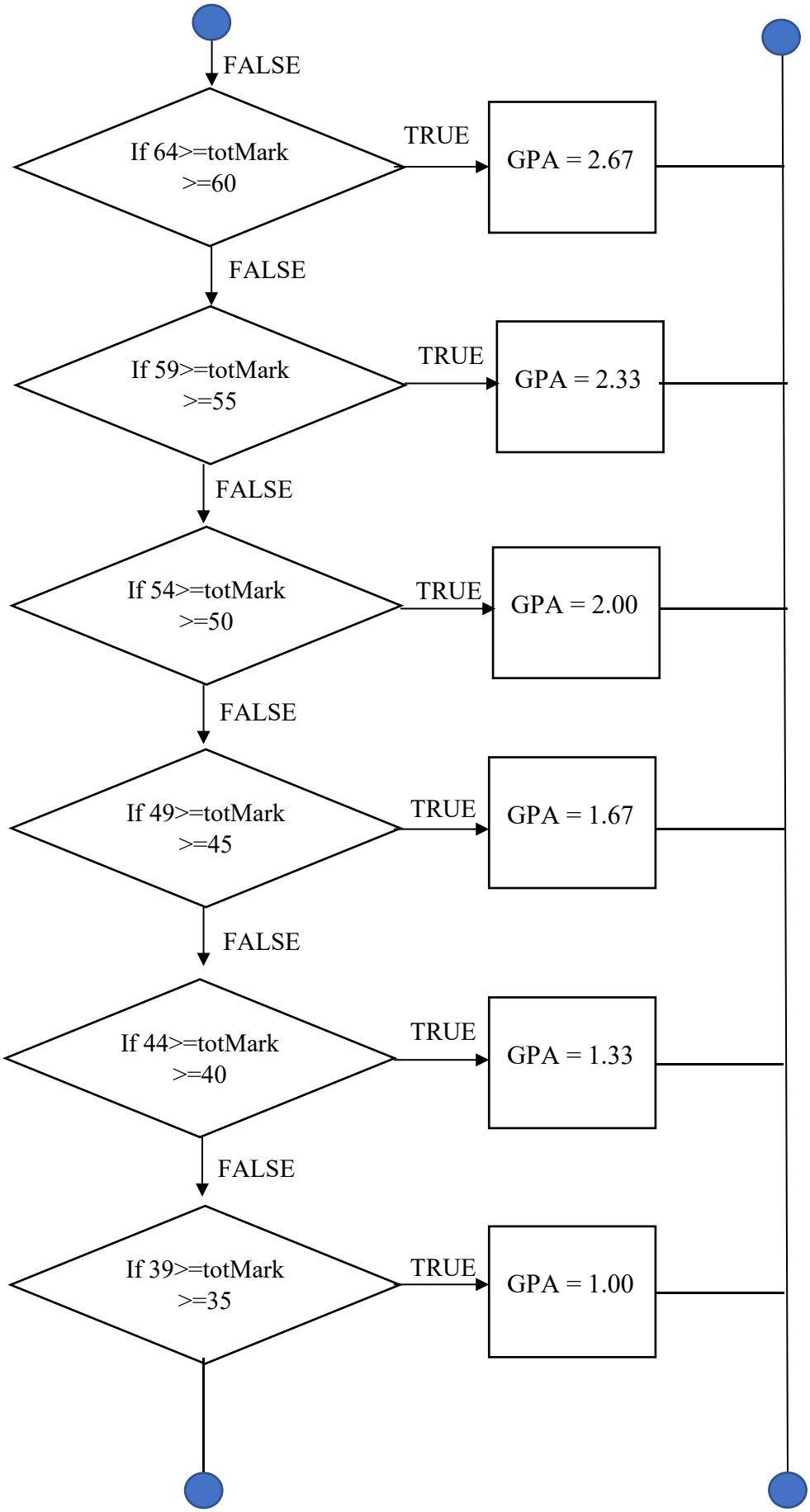
```
            OUTPUT “You've passed the attendane rate requirement but
            failed to
            fulfilled GPA, please retake the course.”
        DEFAULT
            OUTPUT “"You've failed both GPA and attendance rate
            requirements,
            please retake the course.”
        IF scdLvlCourse = 3 THEN
        OUTPUT registered course3 RESULT
        OUTPUT Test 1
        OUTPUT Test 2
        OUTPUT Tests mark
        OUTPUT Coursework marks
        OUTPUT Total marks
        OUTPUT GPA
        OUTPUT Attended time
        OUTPUT Total attend times needed
        OUTPUT Attendance rate
        OUTPUT second-level course REGISTRATION CONFIRMATION
        IF GPA>=2.00 AND attRate>=80 THEN
            OUTPUT “You’ve passed the GPA and attendance rate
            requirements.”
            OUTPUT “second-level course registered successfully!”
        IF GPA>=2.00 AND attRate>=80 THEN
            OUTPUT “You've passed the GPA requirement but failed to
            fulfilled
            attendance rate, please retake the course.”
        IF GPA>=2.00 AND attRate>=80 THEN
            OUTPUT “You've passed the attendane rate requirement but
            failed to
            fulfilled GPA, please retake the course.”
        DEFAULT
            OUTPUT “"You've failed both GPA and attendance rate
            requirements,
            please retake the course.”
        ENDIF
        ENDWHILE
END
```

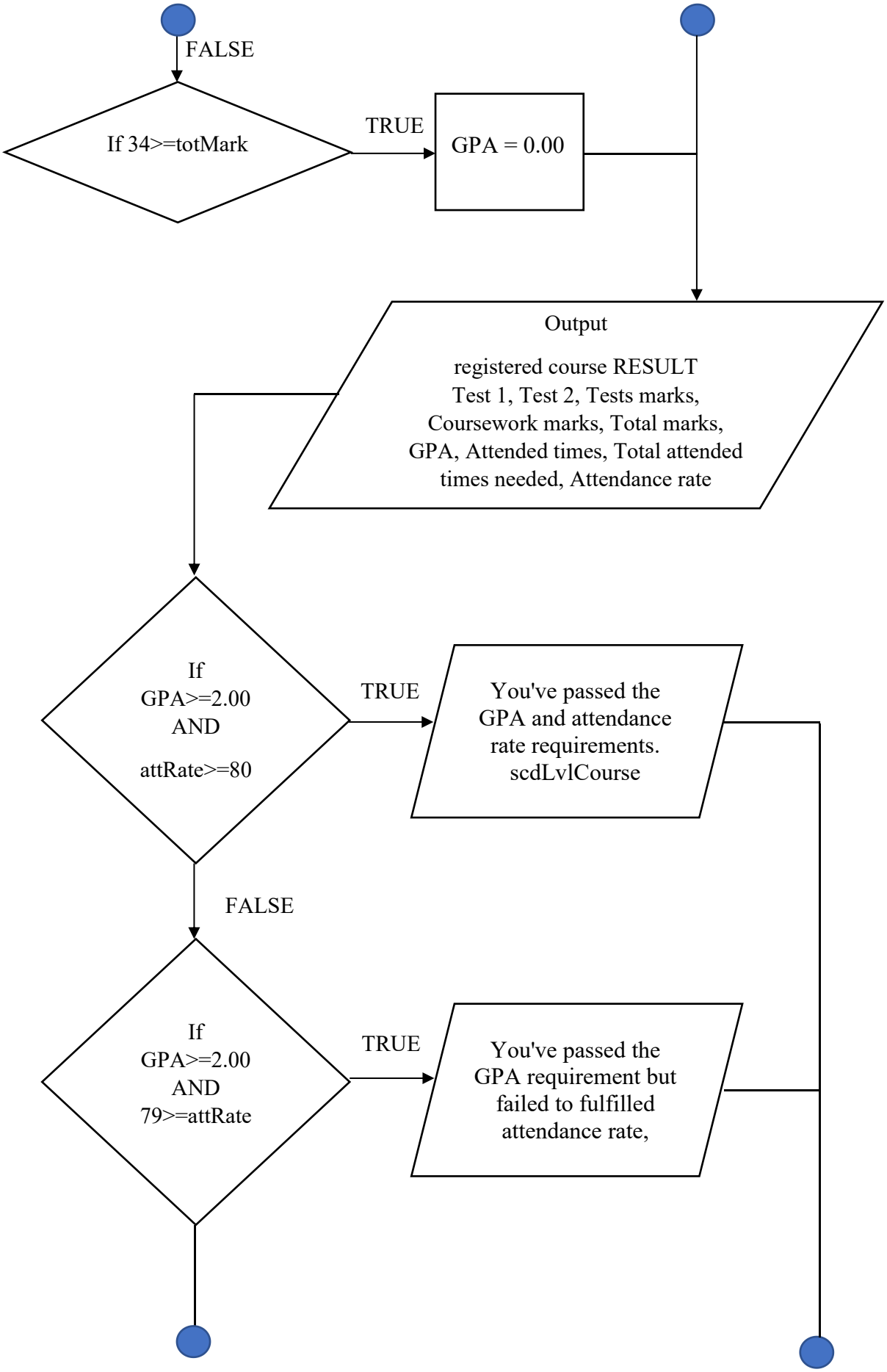
9. Flowchart

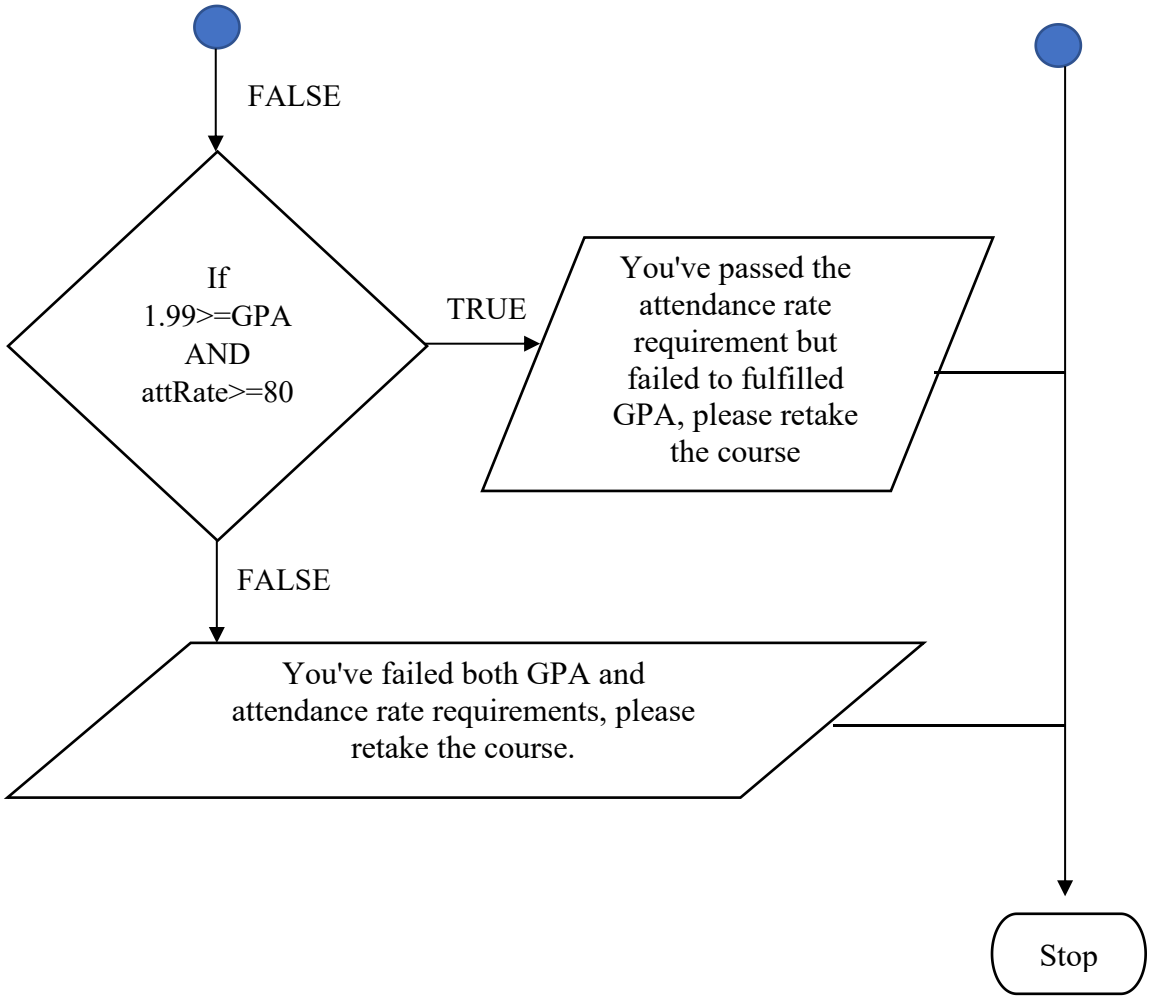

Start
Declare
regCourse, testMark1, testMark2, courseworkMark, totalMark, scdLvlCourse, attTime = n, totalAttTime = 20, minGPA = 2.00, GPA, minAttRate = 80, attRate
Ask user how many courses user took in last sem
User insert number of registered course (max.3)
for i = 1, i<number, i++
if number<=3
FALSE
Ask user to enter a number ranging 1 to 3
TRUE
switch course
case 1
YES
Input registered course name, tests mark and coursework mark
break;
case 2
YES
Input 2 registered course name, tests mark and coursework mark
break;


case 3
YES
Input 3 registered
course name, tests mark
and coursework mark
break;
NO
End switch
course1 = STIA1123
course2 = STID3113
course3 = STQM2103
invalid = true
While
invalid
Ask user to enter a number
ranging 1 to 3
1) STIA1123
2) STID3113
3) STQM2103
Input scdLvlCourse
case 1
YES
STIA1123 requirements
invalid = true
break;
NO
case 1
YES
STID3113 requirements
invalid = true
break;
NO
case 1
YES
STIQM2103 requirements
invalid = true
break;


End switch
default
NO
testsMark = testMark1 + testMark2
totalMark = testsMark + courseworkMark
attRate = (attTime / totAttTime) * 100
GPA = 0
Read
totalMark
If totMark>=80
TRUE
GPA = 4.00
FALSE
If 79>=totMark
>=75
TRUE
GPA = 3.67
FALSE
If 74>=totMark
>=70
TRUE
GPA = 3.33
FALSE
If 69>=totMark
>=65
TRUE
GPA = 3.00


FALSE
If 64>=totMark >=60
TRUE
GPA = 2.67
FALSE
If 59>=totMark >=55
TRUE
GPA = 2.33
FALSE
If 54>=totMark >=50
TRUE
GPA = 2.00
FALSE
If 49>=totMark >=45
TRUE
GPA = 1.67
FALSE
If 44>=totMark >=40
TRUE
GPA = 1.33
FALSE
If 39>=totMark >=35
TRUE
GPA = 1.00


FALSE
If 34>=totMark
TRUE
GPA = 0.00
Output
registered course RESULT
Test 1, Test 2, Tests marks,
Coursework marks, Total marks,
GPA, Attended times, Total attended
times needed, Attendance rate
If
GPA>=2.00
AND
attRate>=80
TRUE
You've passed the
GPA and attendance
rate requirements.
scdLvlCourse
FALSE
If
GPA>=2.00
AND
79>=attRate
TRUE
You've passed the
GPA requirement but
failed to fulfilled
attendance rate,


FALSE
If
1.99>=GPA
AND
attRate>=80
TRUE
You've passed the attendance rate requirement but failed to fulfilled GPA, please retake the course
FALSE
You've failed both GPA and attendance rate requirements, please retake the course.
Stop

10. **Coding**

```java
package TOPIC_UNIVERSITY;
import java.util.Scanner;
public class Assignment_2 {

    private static Scanner sc;
    public static void main(String[] args) {
        // TODO Auto-generated method stub
        sc = new Scanner (System.in);
        String name;
        String regc1=null, regc2=null, regc3=null;
        int id, sem;
        int tm1c1=0, tm1c2=0, tm1c3=0;
        int tm2c1=0, tm2c2=0, tm2c3=0;
        int cmc1=00, cmc2=0, cmc3=0;
        int scdLvlCourse=0;
        int minAttRate = 80;
        double minGPA = 2.00;
        int attTime1 = 18, attTime2 = 15, attTime3 = 20;
        int totAttTime = 20;

        //User info
        System.out.print("USER INFO\n");
        System.out.print("Enter your name: ");
        name = sc.nextLine();
        System.out.print("Enter your id: ");
        id = sc.nextInt();
        System.out.print("Enter your semester: ");
        sem = sc.nextInt();
        System.out.println();

        int lastsem = sem - 1;
        //registered course
        System.out.print("REGISTERED COURSE:\n");
        System.out.println("How many course did you take in sem " +lastsem+ "?");
        System.out.print("Number of registered course (max.3): ");
        int course = sc.nextInt();

        for(int i=1; i<course; i++) { // i=1 wrong attempt only
        if(course<=3) {
        switch (course) {
            case 1: {
                System.out.println();
                System.out.print("Enter registered course 1: ");
                regc1 = sc.next();
                System.out.print("Enter Test 1 Marks: ");
                tm1c1 = sc.nextInt();
                System.out.print("Enter Test 2 Marks: ");
                tm2c1 = sc.nextInt();
                System.out.print("Enter Coursework Marks: ");
                cmc1 = sc.nextInt();
            break;
                }

            case 2: {
                System.out.println();
                System.out.print("Enter registered course 1: ");
                regc1 = sc.next();
                System.out.print("Enter Test 1 Marks: ");
                tm1c1 = sc.nextInt();
                System.out.print("Enter Test 2 Marks: ");
                tm2c1 = sc.nextInt();
                System.out.print("Enter Coursework Marks: ");
                cmc1 = sc.nextInt();

                System.out.print("\nEnter registered course 2: ");
                regc2 = sc.next();
                System.out.print("Enter Test 1 Marks: ");
                tm1c2 = sc.nextInt();
                System.out.print("Enter Test 2 Marks: ");
                tm2c2 = sc.nextInt();
                System.out.print("Enter Coursework Marks: ");
                cmc2 = sc.nextInt();
            break;
                }

            case 3: {
```

```
77                System.out.println();
78                System.out.print("Enter registered course 1: ");
79                regc1 = sc.next();
80                System.out.print("Enter Test 1 Marks: ");
81                tm1c1 = sc.nextInt();
82                System.out.print("Enter Test 2 Marks: ");
83                tm2c1 = sc.nextInt();
84                System.out.print("Enter Coursework Marks: ");
85                cmc1 = sc.nextInt();
86
87                System.out.print("\nEnter registered course 2: ");
88                regc2 = sc.next();
89                System.out.print("Enter Test 1 Marks: ");
90                tm1c2 = sc.nextInt();
91                System.out.print("Enter Test 2 Marks: ");
92                tm2c2 = sc.nextInt();
93                System.out.print("Enter Coursework Marks: ");
94                cmc2 = sc.nextInt();
95
96                System.out.print("\nEnter registered course 3: ");
97                regc3 = sc.next();
98                System.out.print("Enter Test 1 Marks: ");
99                tm1c3 = sc.nextInt();
100               System.out.print("Enter Test 2 Marks: ");
101               tm2c3 = sc.nextInt();
102               System.out.print("Enter Coursework Marks: ");
103               cmc3 = sc.nextInt();
104               System.out.println();
105           break;
106           }
107
108           default:
109           }
110       }
111       else {
112           System.out.print("Please enter a valid number (1-3).\n");
113           System.out.println("\nREGISTERED COURSE:");
114           System.out.println("How many course did you take in sem " +lastsem+ "?");
115           System.out.print("Number of registered course (max.3): ");
116           course = sc.nextInt();
117           }
118       }
119
120       //Second-level course registration and course's requirements
121       String c1 = "STIA1123";
122       String c2 = "STID3113";
123       String c3 = "STQM2103";
124       boolean invalid = true;
125       while (invalid){
126       System.out.print("Enter the second-level course you want to register: \n");
127       System.out.println("Press:\n (1) STIA1123 \n (2) STID3113 \n (3) STQM2103");
128       System.out.print("Your answer: \n");
129       scdLvlCourse = sc.nextInt();
130
131       switch (scdLvlCourse) {
132       case 1: {
133           System.out.println(c1 + " requirements: ");
134           System.out.println("Completed "+regc1+ " with GPA " +String.format("%.2f",minGPA)+
135                       " and attendance rate " +minAttRate+ "% or above.");
136           System.out.println();
137           invalid = false;
138           break;
139           }
140
141       case 2: {
142           System.out.println(c2 + " requirements: ");
143           System.out.println("Completed "+regc2+" with GPA " +String.format("%.2f",minGPA)+
144                       " and attendance rate " +minAttRate+ "% or above.");
145           System.out.println();
146           invalid = false;
147           break;
148           }
149
150       case 3: {
151           System.out.println(c3 + " requirements: ");
152           System.out.println("Completed "+regc3+" with GPA " +String.format("%.2f",minGPA)+
```

```
153                         " and attendance rate " +minAttRate+ "% or above.");
154             System.out.println();
155             invalid = false;
156             break;
157             }
158 
159         default:
160             System.out.println("Invalid course.");
161             System.out.print("Please re-enter a valid course.\n");
162             System.out.println();
163             }
164         }
165 
166         //Formula
167         int tMark1 = tm1c1 + tm2c1;
168         int totMark1 = tMark1 + cmc1;
169         double att1 = (double) attTime1 / totAttTime;
170         double attRate1 = att1 * 100;
171         double GPA1=0;
172         if (totMark1>=80)
173             GPA1 = 4.00;
174         if ((totMark1>=75) && (totMark1<=79))
175             GPA1 = 3.67;
176         if ((totMark1>=70) && (totMark1<=74))
177             GPA1 = 3.33;
178         if ((totMark1>=65) && (totMark1<=69))
179             GPA1 = 3.00;
180         if ((totMark1>=60) && (totMark1<=64))
181             GPA1 = 2.67;
182         if ((totMark1>=55) && (totMark1<=59))
183             GPA1 = 2.33;
184         if ((totMark1>=50) && (totMark1<=54))
185             GPA1 = 2.00;
186         if ((totMark1>=45) && (totMark1<=49))
187             GPA1 = 1.67;
188         if ((totMark1>=40) && (totMark1<=44))
189             GPA1 = 1.33;
190         if ((totMark1>=35) && (totMark1<=39))
191             GPA1 = 1.00;
192         if (totMark1<=34)
193             GPA1 = 0.00;
194 
195         int tMark2 = tm1c2 + tm2c2;
196         int totMark2 = tMark2 + cmc2;
197         double att2 = (double) attTime2 / totAttTime;
198         double attRate2 = att2 * 100;
199         double GPA2=0;
200         if (totMark2>=80)
201             GPA2 = 4.00;
202         if ((totMark2>=75) && (totMark2<=79))
203             GPA2 = 3.67;
204         if ((totMark2>=70) && (totMark2<=74))
205             GPA2 = 3.33;
206         if ((totMark2>=65) && (totMark2<=69))
207             GPA2 = 3.00;
208         if ((totMark2>=60) && (totMark2<=64))
209             GPA2 = 2.67;
210         if ((totMark2>=55) && (totMark2<=59))
211             GPA2 = 2.33;
212         if ((totMark2>=50) && (totMark2<=54))
213             GPA2 = 2.00;
214         if ((totMark2>=45) && (totMark2<=49))
215             GPA2 = 1.67;
216         if ((totMark2>=40) && (totMark2<=44))
217             GPA2 = 1.33;
218         if ((totMark2>=35) && (totMark2<=39))
219             GPA2 = 1.00;
220         if (totMark2<=34)
221             GPA2 = 0.00;
222 
223         int tMark3 = tm1c3 + tm2c3;
224         int totMark3 = tMark3 + cmc3;
225         double att3 = (double) attTime3 / totAttTime;
226         double attRate3 = att3 * 100;
227         double GPA3=0;
228         if (totMark3>=80)
```

```
            GPA3 = 4.00;
        if ((totMark3>=75) && (totMark3<=79))
            GPA3 = 3.67;
        if ((totMark3>=70) && (totMark3<=74))
            GPA3 = 3.33;
        if ((totMark3>=65) && (totMark3<=69))
            GPA3 = 3.00;
        if ((totMark3>=60) && (totMark3<=64))
            GPA3 = 2.67;
        if ((totMark3>=55) && (totMark3<=59))
            GPA3 = 2.33;
        if ((totMark3>=50) && (totMark3<=54))
            GPA3 = 2.00;
        if ((totMark3>=45) && (totMark3<=49))
            GPA3 = 1.67;
        if ((totMark3>=40) && (totMark3<=44))
            GPA3 = 1.33;
        if ((totMark3>=35) && (totMark3<=39))
            GPA3 = 1.00;
        if (totMark3<=34)
            GPA3 = 0.00;

        System.out.println("*********************************************************************");
        //Display User Info
        System.out.println("---------------------------------------------------------------------");
        System.out.println("\t\t\t   USER INFO");
        System.out.println("---------------------------------------------------------------------");
        System.out.println("Name                    : " +name);
        System.out.println("ID                      : " +id);
        System.out.println("Semester                : " +sem);
        System.out.println();

        //Display GPA of the registered course
        if(scdLvlCourse == 1) {
            System.out.println("---------------------------------------------------------------------");
            System.out.println("\t\t\t" +regc1+ " RESULT");
            System.out.println("---------------------------------------------------------------------");
            System.out.println("Test 1                  : " +tm1c1+ "%");
            System.out.println("Test 2                  : " +tm2c1+ "%");
            System.out.println("Tests marks             : " +tMark1+ "%");
            System.out.println("Coursework marks            : " +cmc1+ "%");
            System.out.println("Total marks             : " +totMark1+ "%");
            System.out.printf("GPA                   : %.2f",GPA1);
            System.out.println();

            //Display attendance rate of the registered course
            System.out.println("Attended times              : " +attTime1+ " days");
            System.out.println("Total Attended times needed         : " +totAttTime+ " days");
            System.out.println("Attendance rate             : " +attRate1+ "%");
            System.out.println();

            //Display whether the student qualify for the second-level course registration or not
            System.out.println("---------------------------------------------------------------------");
            System.out.println("\t\t" +c1+ " REGISTRATION CONFIRMATION");
            System.out.println("---------------------------------------------------------------------");
                if ((GPA1>=2.00) && (attRate1>=80)) {
                    System.out.print("You've passed the GPA and attendance rate requirements.\n");
                    System.out.print(c1+ " registered sucessfully!\n");
                }

                else if ((GPA1>=2.00) && (attRate1<=79)) {
                    System.out.print("You've passed the GPA requirement but failed to fulfilled "
                                + "attendance rate, please retake the course.\n");
                }

                else if ((GPA1<=1.99) && (attRate1>=80)) {
                    System.out.print("You've passed the attendance rate requirement but failed to "
                                + "fulfilled GPA, please retake the course.\n");
                }
                else {
                    System.out.print("You've failed both GPA and attendance rate requirements, "
                                + "please retake the course.\n");
                }
            }

        else if(scdLvlCourse == 2) {
```

```
305             System.out.println("-------------------------------------------------------------------------");
306             System.out.println("\t\t\t" +regc2+ " RESULT");
307             System.out.println("-------------------------------------------------------------------------");
308             System.out.println("Test 1                  : " +tm1c2+ "%");
309             System.out.println("Test 2                  : " +tm2c2+ "%");
310             System.out.println("Tests marks             : " +tMark2+ "%");
311             System.out.println("Coursework marks            : " +cmc2+ "%");
312             System.out.println("Total marks             : " +totMark2+ "%");
313             System.out.printf("GPA                 : %.2f",GPA2);
314             System.out.println();
315
316             //Display attendance rate of the registered course
317             System.out.println("Attended times              : " +attTime2+ " days");
318             System.out.println("Total Attended times needed         : " +totAttTime+ " days");
319             System.out.println("Attendance rate             : " +attRate2+ "%");
320             System.out.println();
321
322             //Display whether the student qualify for the second-level course registration or not
323             System.out.println("-------------------------------------------------------------------------");
324             System.out.println("\t\t" +c2+ " REGISTRATION CONFIRMATION");
325             System.out.println("-------------------------------------------------------------------------");
326                 if ((GPA2>=2.00) && (attRate1>=80)) {
327                     System.out.print("You've passed the GPA and attendance rate requirements.\n");
328                     System.out.print(c2+ " registered sucessfully!\n");
329                 }
330
331                 else if ((GPA2>=2.00) && (attRate1<=79)) {
332                     System.out.print("You've passed the GPA requirement but failed to fulfilled "
333                                 + "attendance rate, please retake the course.\n");
334                 }
335
336                 else if ((GPA2<=1.99) && (attRate1>=80)) {
337                     System.out.print("You've passed the attendance rate requirement but failed to "
338                                 + "fulfilled GPA, please retake the course.\n");
339                 }
340                 else {
341                     System.out.print("You've failed both GPA and attendance rate requirements, "
342                                 + "please retake the course.\n");
343                 }
344             }
345
346         else if(scdLvlCourse == 3) {
347             System.out.println("-------------------------------------------------------------------------");
348             System.out.println("\t\t\t" +regc3+ " RESULT");
349             System.out.println("-------------------------------------------------------------------------");
350             System.out.println("Test 1                  : " +tm1c3+ "%");
351             System.out.println("Test 2                  : " +tm2c3+ "%");
352             System.out.println("Tests marks             : " +tMark3+ "%");
353             System.out.println("Coursework marks            : " +cmc3+ "%");
354             System.out.println("Total marks             : " +totMark3+ "%");
355             System.out.printf("GPA                 : %.2f",GPA3);
356             System.out.println();
357             //Display attendance rate of the registered course
358             System.out.println("Attended times              : " +attTime3+ " days");
359             System.out.println("Total Attended times needed         : " +totAttTime+ " days");
360             System.out.println("Attendance rate             : " +attRate3+ "%");
361             System.out.println();
362
363             //Display whether the student qualify for the second-level course registration or not
364             System.out.println("-------------------------------------------------------------------------");
365             System.out.println("\t\t" +c3+ " REGISTRATION CONFIRMATION");
366             System.out.println("-------------------------------------------------------------------------");
367                 if ((GPA3>=2.00) && (attRate1>=80)) {
368                     System.out.print("You've passed the GPA and attendance rate requirements.\n");
369                     System.out.print(c3+ " registered sucessfully!\n");
370                 }
371
372                 else if ((GPA3>=2.00) && (attRate1<=79)) {
373                     System.out.print("You've passed the GPA requirement but failed to fulfilled "
374                                 + "attendance rate, please retake the course.\n");
375                 }
376
377                 else if ((GPA3<=1.99) && (attRate1>=80)) {
378                     System.out.print("You've passed the attendance rate requirement but failed to "
379                                 + "fulfilled GPA, please retake the course.\n");
380                 }
```

```
                else {
                    System.out.print("You've failed both GPA and attendance rate requirements, "
                                + "please retake the course.\n");
                }
            }
        System.out.println("**********************************************************************");
    }
}
```

Output

```
USER INFO
Enter your name: TANG WEI CHIANG
Enter your id: 286841
Enter your semester: 2

REGISTERED COURSE:
How many course did you take in sem 1?
Number of registered course (max.3): 4
Please enter a valid number (1-3).

REGISTERED COURSE:
How many course did you take in sem 1?
Number of registered course (max.3): 3

Enter registered course 1: STIA1113
Enter Test 1 Marks: 36
Enter Test 2 Marks: 36
Enter Coursework Marks: 18

Enter registered course 2: STQS1023
Enter Test 1 Marks: 20
Enter Test 2 Marks: 20
Enter Coursework Marks: 16

Enter registered course 3: STQM1203
Enter Test 1 Marks: 15
Enter Test 2 Marks: 15
Enter Coursework Marks: 14

Enter the second-level course you want to register:
Press:
 (1) STIA1123
 (2) STID3113
 (3) STQM2103
```

```
Your answer:
1
STIA1123 requirements:
Completed STIA1113 with GPA 2.00 and attendance rate 80% or above.

**********************************************************************
----------------------------------------------------------------------
                          USER INFO
----------------------------------------------------------------------
Name                                  : wc
ID                                    : 23
Semester                              : 2

----------------------------------------------------------------------
                       STIA1113 RESULT
----------------------------------------------------------------------
Test 1                                : 36%
Test 2                                : 36%
Tests marks                           : 72%
Coursework marks                      : 18%
Total marks                           : 90%
GPA                                   : 4.00
Attended times                        : 18 days
Total Attended times needed           : 20 days
Attendance rate                       : 90.0%

----------------------------------------------------------------------
               STIA1123 REGISTRATION CONFIRMATION
----------------------------------------------------------------------
You've passed the GPA and attendance rate requirements.
STIA1123 registered sucessfully!
**********************************************************************
```

```
Your answer:
2
STID3113 requirements:
Completed STQS1023 with GPA 2.00 and attendance rate 80% or above.

**********************************************************************
----------------------------------------------------------------------
                          USER INFO
----------------------------------------------------------------------
Name                                  : wc
ID                                    : 23
Semester                              : 2

----------------------------------------------------------------------
                       STQS1023 RESULT
----------------------------------------------------------------------
Test 1                                : 20%
Test 2                                : 20%
Tests marks                           : 40%
Coursework marks                      : 15%
Total marks                           : 55%
GPA                                   : 2.33
Attended times                        : 15 days
Total Attended times needed           : 20 days
Attendance rate                       : 75.0%

----------------------------------------------------------------------
               STID3113 REGISTRATION CONFIRMATION
----------------------------------------------------------------------
You've passed the GPA requirement but failed to fulfilled attendance rate, please retake the course.
**********************************************************************
Your answer:
3
STQM2103 requirements:
Completed STQM1203 with GPA 2.00 and attendance rate 80% or above.

**********************************************************************
----------------------------------------------------------------------
                          USER INFO
----------------------------------------------------------------------
Name                                  : wc
ID                                    : 23
Semester                              : 2

----------------------------------------------------------------------
                       STQM1203 RESULT
----------------------------------------------------------------------
Test 1                                : 15%
Test 2                                : 15%
Tests marks                           : 30%
Coursework marks                      : 14%
Total marks                           : 44%
GPA                                   : 1.33
Attended times                        : 20 days
Total Attended times needed           : 20 days
Attendance rate                       : 100.0%

----------------------------------------------------------------------
               STQM2103 REGISTRATION CONFIRMATION
----------------------------------------------------------------------
You've passed the attendance rate requirement but failed to fulfilled GPA, please retake the course.
**********************************************************************
```

LIBRARY- FARA AYEESHA BINTI AHMAD YUSNI

1. Identify the Problem

A library is a place where people read and borrow books. It is a specially made location to store books and information so that anyone can easily access it no matter their status. However, in allowing people to borrow books, there is a problem wherein books are not being checked in according to the designated times. This creates a headache for librarians in being unable to lend the books to other people who has requested for it.

A lot of ways has been done to help mitigate this problem such as sending a reminder to the borrower's home address, banning them from future borrowing of books from the library, or charging fines to cover the loss of the books.

2. Understand the Problem

The librarian in a local university has made a decision to charge students who return books late to the library with a fine. The fine is different for every student. The base fine for each days late is RM1.00. An additional fine will be imposed based on the student's years of study. For first years, the additional fine is RM1.00 per day. For second years, the additional fine is RM2.00 per day. For third years, the additional fine is RM3.00 per day. If they have different books with different check out times, it will be calculated independent of each other.

Year of Study	1st Year	2nd Year	3rd Year
Base Fine Per Day	RM1.00	RM1.00	RM1.00
Additional Fine Per Day	RM1.00	RM2.00	RM3.00

3. Alternative Method

Ways:

1. Write a program that can calculate the total fine based on the student's year of study, number of days late, and fine per day.

2. Write a program that can calculate the total fine based on the student's year of study, number of days late, and fine per day, calculating independently if there are more than 1 book.

3. Write a program that can calculate the total fine for all students and listing their name in one huge list.

4. Best Method

(2.) way because it is more detailed and clearer compared to (1.) and (3.). It fulfills the librarian's request of charging each student according to the accumulated fines.

5. Instructions

1. User enters the student's name, student ID, year of study
2. User enters number of books due
3. User inputs the book title and ISBN number, and number of days late based on number of books due
4. The program calculates the total fine with the formula

   total fine = (RM1.00*number of days late) + (additional fine*number of days late)
5. System prints out a slip containing the student's name, student ID, years of study, total fine, and number of days late.

6. Evaluate the Solution

The solution meets the requirement to solve the problems stated. The fine for the late delivery of one book is calculated based on the student's year of study and the number of days late. With books of different duration of late time, the fine will be calculated independent of the first book. The system will then display the student's info, the books' info, the total fine, and the number of days late for each book.

7. Algorithm

count = 0

sum = 0

totalFine = sum

discountedFine = (float) (totalFine * 0.8)

8. Pseudocode

1. Start
2. Declare String name, int studentID, int yearCode, int daysLate, int totalFine, String bookTitle, String ISBN, char excuse, float discountedFine, int numBooks, String excuseDesc, float bookFine, float sum
3. Output "Enter name: "
4. Input name
5. Output "Student ID: "
6. Input studentID
7. Output "Year of study: "
8. Input yearCode
9. Output "Does the student have a valid excuse? Enter y or n"
10. Input excuse
11. if (excuse == y)

Input excuseDesc

12. Output “Number of books: “

13. Input numBooks

14. If (count < numBooks)

    count = 0

    sum = 0

    Input bookTitle, ISBN, daysLate

    PRINT bookTitle,ISBN, daysLate

    bookFine = (daysLate*yearCode) + (daysLate*1)

    sum = sum + bookFine

    count = count + 1

    repeat if

    end

15. if (excuse == y)

    totalFine = sum

    discountedFine = (float) (totalFine * 0.8)

    PRINT discounted fine

    else

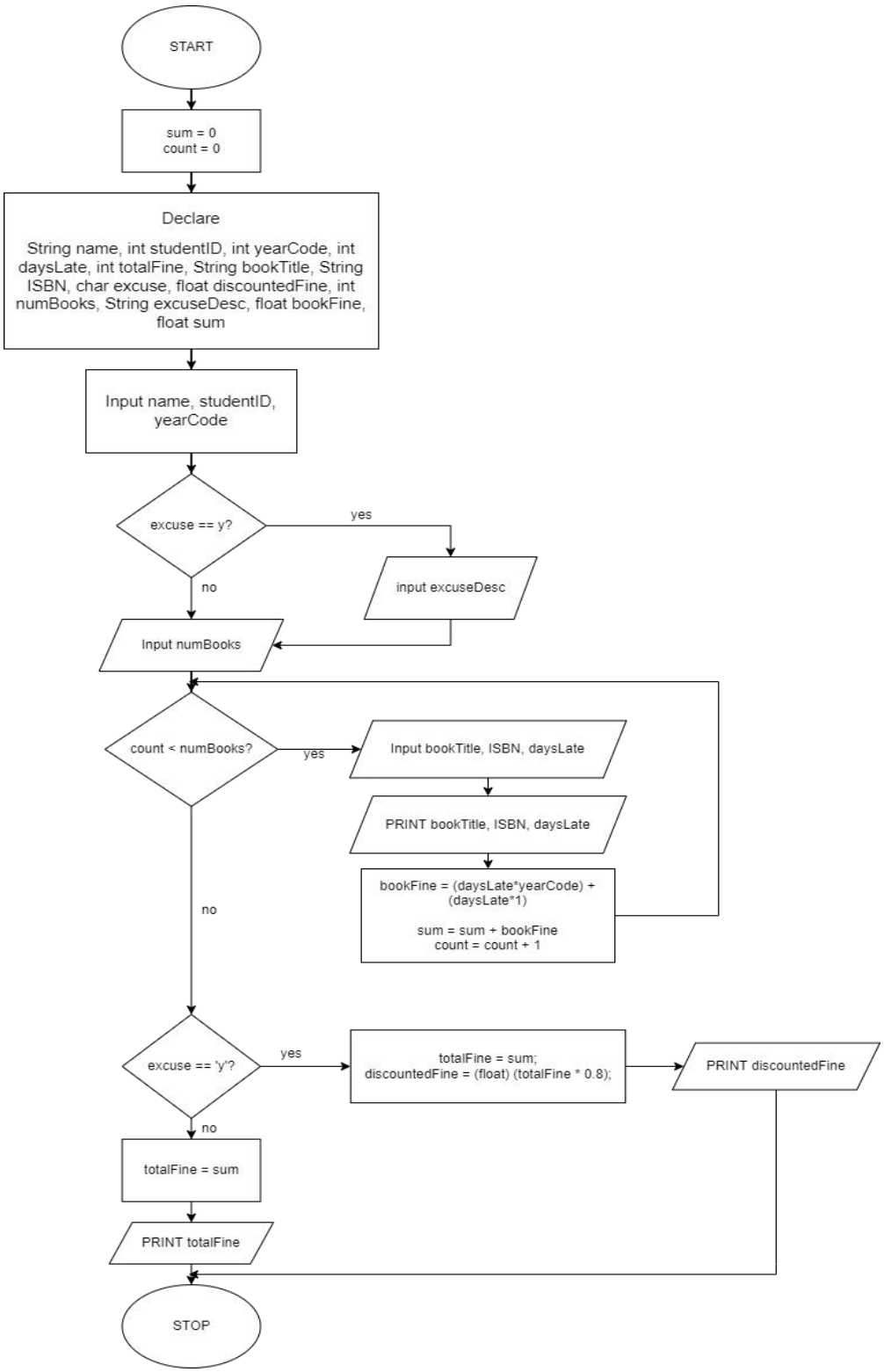
    totalFine = sum

    PRINT totalFine

16. Output “**Please pay at the counter.”

17. End

9. Flowchart


START
sum = 0
count = 0
Declare
String name, int studentID, int yearCode, int daysLate, int totalFine, String bookTitle, String ISBN, char excuse, float discountedFine, int numBooks, String excuseDesc, float bookFine, float sum
Input name, studentID, yearCode
excuse == y?
yes
input excuseDesc
no
Input numBooks
count < numBooks?
yes
Input bookTitle, ISBN, daysLate
PRINT bookTitle, ISBN, daysLate
bookFine = (daysLate*yearCode) + (daysLate*1)
sum = sum + bookFine
count = count + 1
no
excuse == 'y'?
yes
totalFine = sum;
discountedFine = (float) (totalFine * 0.8);
PRINT discountedFine
no
totalFine = sum
PRINT totalFine
STOP

10. Coding

```java
package university;
import java.util.Scanner;

public class Library2 {

    public static void main(String[] args) {
        // TODO Auto-generated method stub

        Scanner sc = new Scanner(System.in);

        String name;
        int studentID;
        int yearCode;
        int daysLate = 0;
        float totalFine;
        String bookTitle;
        String ISBN;
        char excuse;
        float discountedFine = 0;
        int numBooks;
        String excuseDesc;
        float bookFine;
        float sum = 0;

        System.out.println("Enter student's name: ");
        name = sc.nextLine();
        System.out.println("Enter student's ID: ");
        studentID = sc.nextInt();
        System.out.println("Enter student's year of study: ");
        yearCode = sc.nextInt();

        System.out.println("Does the student have a valid excuse? Enter y or n");
        excuse = sc.next().charAt(0);
        sc.nextLine();

        if (excuse == 'y') {
            System.out.println("Enter student's excuse. ");
            excuseDesc = sc.next();
           sc.nextLine();
       }
       else
           System.out.println();

       System.out.println("Enter number of books late: ");
       numBooks = sc.nextInt();

       System.out.println();

       System.out.println("============================================================");
       System.out.println();
       System.out.println("*Student Info");
       System.out.println("Name: \t \t \t \t" + name);
       System.out.println("Student ID: \t \t \t" + studentID);
       System.out.println("Student's year of study: \t" + yearCode);
       System.out.println();
       System.out.println("************************************************************");
       System.out.println("*Book Info");

       for (int i = 0; i < numBooks; i++) {
           sc.nextLine();
           System.out.println("Enter book's title: ");
           bookTitle = sc.nextLine();
           System.out.println("Enter book's ISBN number: ");
           ISBN = sc.nextLine();
           System.out.println("Enter number of days late for the book: ");
           daysLate = sc.nextInt();
           bookFine = (daysLate*yearCode) + (daysLate*1);
           System.out.println("Book title: \t \t \t" + bookTitle);
           System.out.println("Book ISBN number:  \t \t" + ISBN);
           System.out.println("Fee: \t \t \t \tRM" + bookFine);
           sum = sum + bookFine;
           System.out.println();
       }

       if (excuse == 'y') {
           totalFine = sum;
             discountedFine = (float) (totalFine * 0.8);
        }

        else
            totalFine = sum;

        System.out.println();

        if (excuse == 'y') {
            System.out.printf("Total fee is: RM" + "%.2f",discountedFine);
        }
        else
            System.out.println("Total fee is: RM" + totalFine);

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

    }

}
```

Output

```
Enter student's name:
Eri
Enter student's ID:
275869
Enter student's year of study:
3
Does the student have a valid excuse? Enter y or n
n

Enter number of books late:
2

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

*Student Info
Name:                           Eri
Student ID:                     275869
Student's year of study:        3

************************************************************
*Book Info
Enter book's title:
Lost One's Weeping
Enter book's ISBN number:
736486947215
Enter number of days late for the book:
7
Book title:                     Lost One's Weeping
Book ISBN number:               736486947215
Fee:                            RM28.0

Enter book's title:
The Day You Vanished Among The Stars
Enter book's ISBN number:
936175849583
Enter number of days late for the book:
10
Book title:                     The Day You Vanished Among The Stars
Book ISBN number:               936175849583
Fee:                            RM40.0


Total fee is: RM68.0

************************************************************

============================================================
```

TOPIC MEDICAL - NIK MOHAMAD HANIS BIN NIK YAHYA

1. Identify the problem

The outbreak of corona virus diseases (COVID-19) has been substantially influencing the life and living of people across the world, especially after the declaration of a global pandemic by the World Health Organization in the second week of March 2020. This unprecedented 'home isolation' under lockdown, along with the uncertainty of academic and professional careers, has had a variety of effects on students' mental health. Based on many published studies, longer duration of quarantine has made some of the students affected by mental health disorders such as stress, anxiety, and depression (SAD).

Most of the students in Malaysia are having a problem with online class during pandemic because they have to adapt to a new situation which is more struggling and harder for them. Learning through online platforms have given rise to depression and anxiety disorders among undergraduate university students, where there was a significant correlation between student satisfaction and prevalence of depression, anxiety, and stress.

2. Understand the problem

Ahmad is a medical student who studied at University Utara Malaysia (UUM) and currently in semester 3. According to current situation where students must study through online platforms and cannot attend physical class because of covid-19, Ahmad and his groupmate must do a survey and analysis as a medical student on depression and anxiety among UUM students as their assignment project.

They have made a survey of the level of anxiety and depression among 100 UUM students from different schools, which is 25 students in each school at UUM. All of the students already make responses to their project and Ahmad have been entrusted to keep all the data that the responses made. Unfortunately, Ahmad laptop have been format and only some of the data can be saved.

In conclusion, 25% out of 100 students have reached the anxiety level while 32% of them have reached the depression level. Based on the survey, 2.25% and 1.50% of computing and accounting students have anxiety respectively while law and

business students both have the same percentage. 3.52% and 2.88% of students that have depression are from law and computing students respectively. The remaining students are business and accounting students because both of these schools share the same percentage.

Now, they are facing a problem on how to separate that information and calculate the percentage of students, total number of students, female students and male students from each school who have anxiety and depression.

3. Alternative ways

i. Ahmad has to do the survey again and saved the data.
ii. Ahmad just has to make assumptions on the number of students that have anxiety and depression from each school.
iii. Ahmad has to calculates and display the percentage of students, total number of students, female students and male students that have anxiety and depression from each school which is law, computing, business and accounting based on the data given.

4. Best way

Ahmad has to calculates and display the percentage of students, total number of students, female students and male students that have anxiety and depression from each school which is law, computing, business and accounting based on the data given.

5. Instruction

i. Users enter the percentage of students who have anxiety in School of Computing (2.25%) and School of Accounting (1.5%) based on the result of the survey.
ii. Then, the program will calculate the number of students and show the percentage of students who have anxiety in each school.

(2.25/25 x 100 = 9 students) - School of Computing

(1.5/25 x 100 = 6 students) - School of Accounting

((25 – 9+6)/2 = 5 students) - School of Business & Law

(5/100 x 25 = 1.25%) - Percentage student in School of Business & Law

iii. Then, the program will calculate and separate the number of male and female students based on the data given that have anxiety in each school.

(5-0 = 5 female students) -School of Law
(9-6 = 3 male students)- School of Computing
(5-1 = 4 female students) - School of Business
(6-4 = 2 male students)- School of Accounting

iv. Next, users enter the percentage of students who have depression in the School of Law (3.52%) and School of Computing (2.88%) based on the result of the survey.

v. Then, the program will calculate the number of students and show the percentage of students who have depression in each school.

(3.52/32 x 100 = 11 students) -School of Law
(2.88/32 x 100 = 9 students) - School of Computing
((32 – 11+9)/2 = 6 students) - School of Business & Accounting
(6/100 x 32 = 1.92%) - Percentage student in School of Business, Accounting

vi. Then, the program will calculate and separate the number of male and female students based on the data given that have depression in each school.

(11-4 = 7 female students) -School of Law
(9-5 = 4 male students)- School of Computing
(6-2 = 4 female students) - School of Business
(6-3 = 3 male students)- School of Accounting

vii. The program will list all schools with the percentage of students, total number of students, female students and male students who have anxiety and depression.

6. Evaluate the solution

The solution meets the requirement to solve the problems stated. Firstly, percentage of all students is equal to total number of students which is 25 students have anxiety and 32 students have depression. The percentage of each school of students that have anxiety and depression will be calculated based on the data remaining that Ahmad have. Next, the system will also calculate total number of students in each school based on the percentage of students. As the result of the total number of students in each school have been calculated, Ahmad will key in the remaining data that has been saved male and female student to calculate number of male and female student from each school who have anxiety and depression. Lastly, all the data will be displayed completely.

7. Algorithm

i. 100 students done the anxiety and depression test
ii. 25% out of all students have anxiety
iii. 32% out of all students have depression

Anxiety Test

School	Percentage Of Students (%)	Number Of Students	Female student	Male student
School of Law	1.25	5	5	0
School of Computing	2.25	9	6	3
School of Business	1.25	5	4	1
School of Accounting	1.50	6	4	2

Depression test

School	Percentage Of Students (%)	Number Of Students	Female student	Male student
School of Law	3.52	11	7	4
School of Computing	2.88	9	5	4
School of Business	1.92	6	4	2
School of Accounting	1.92	6	3	3

8. Pseudocode

Start

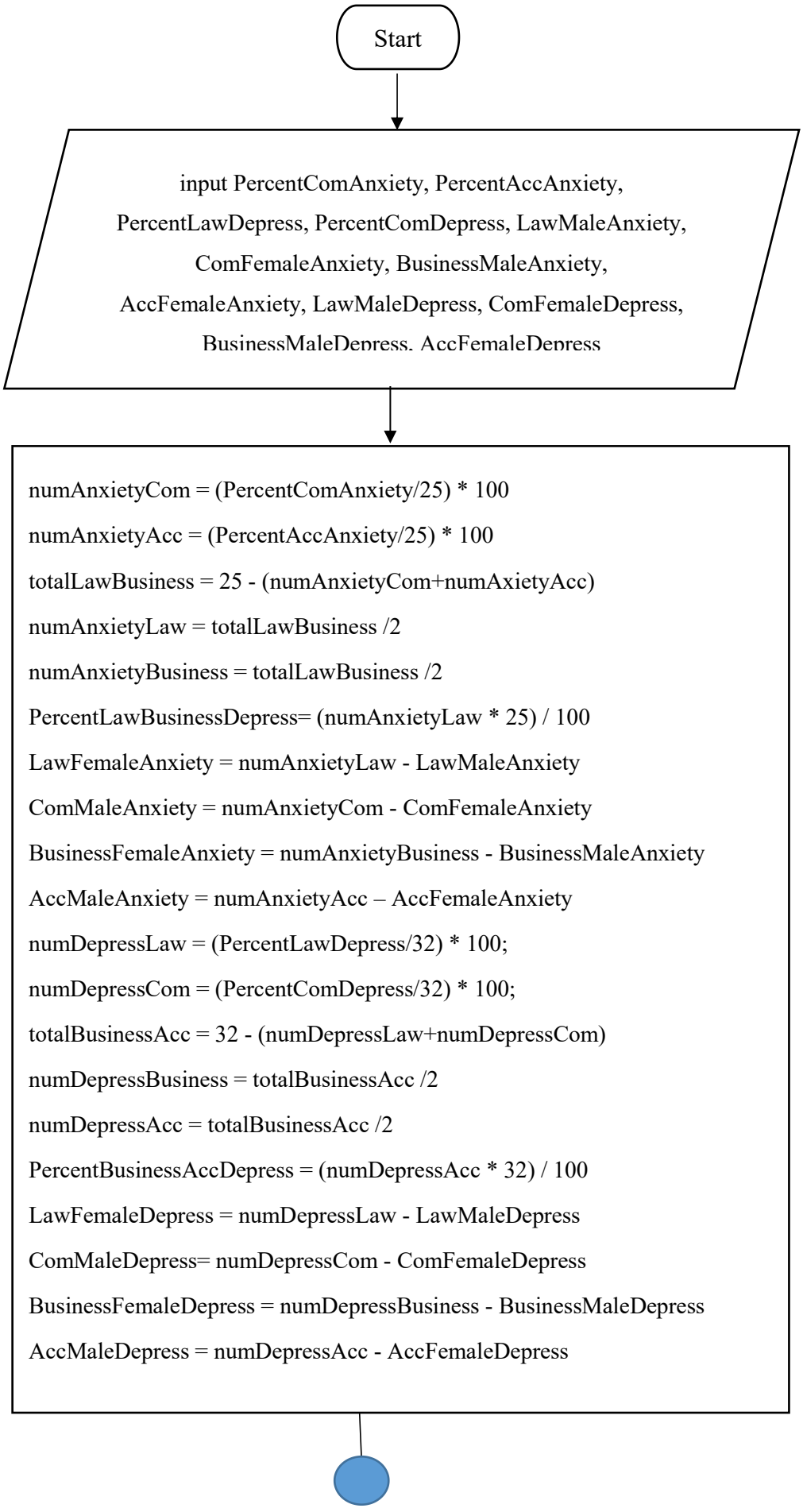
input PercentComAnxiety, PercentAccAnxiety, PercentLawDepress, PercentComDepress, LawMaleAnxiety, ComFemaleAnxiety, BusinessMaleAnxiety, AccFemaleAnxiety, LawMaleDepress, ComFemaleDepress, BusinessMaleDepress, LevelAnxietyBusiness, LevelDepressBusiness,

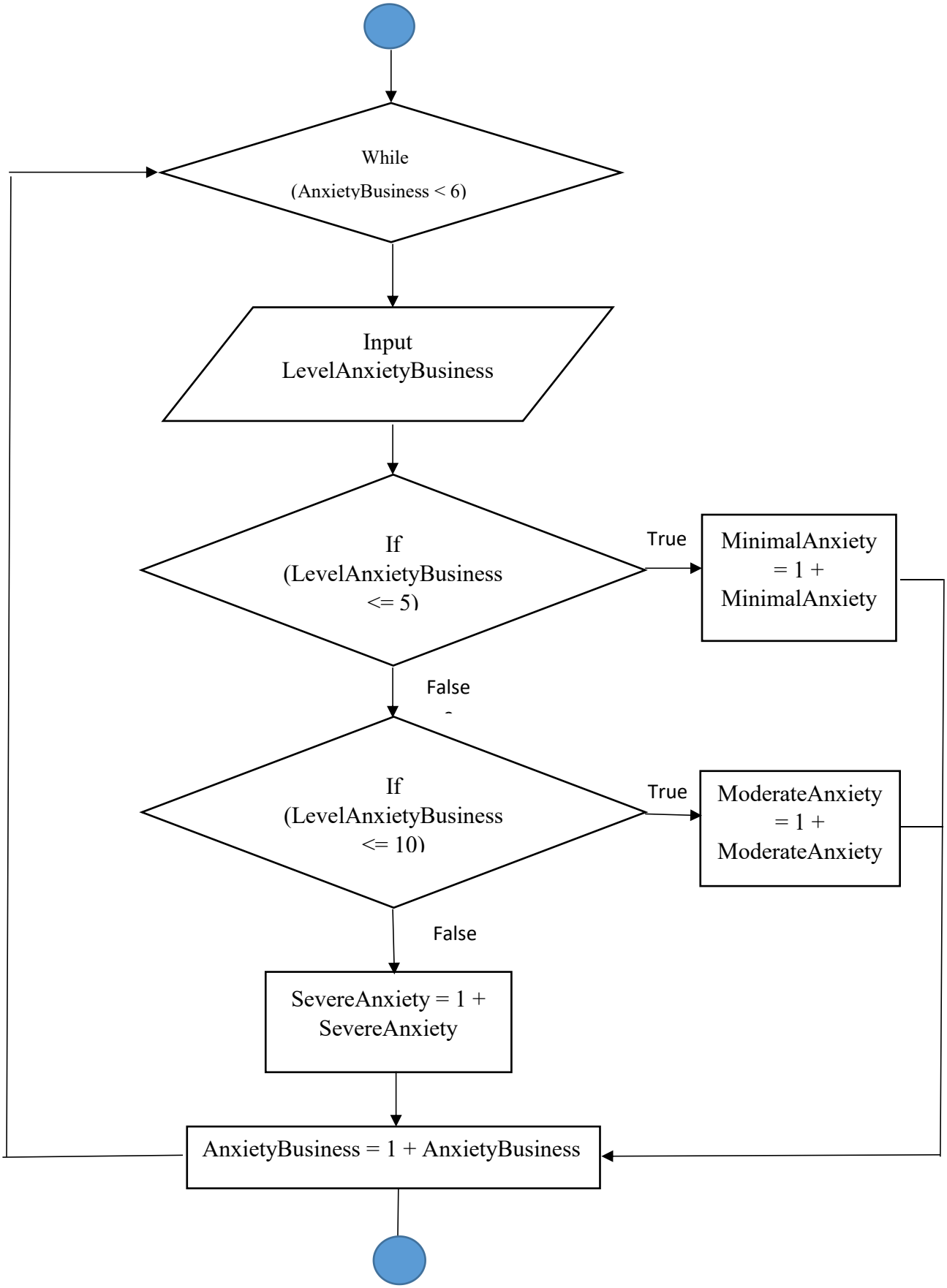
AccFemaleDepress numAnxietyCom = (PercentComAnxiety/25) * 100
numAnxietyAcc = (PercentAccAnxiety/25) * 100
totalLawBusiness = 25 - (numAnxietyCom+numAxietyAcc)
numAnxietyLaw = totalLawBusiness /2
numAnxietyBusiness = totalLawBusiness /2
PercentLawBusinessDepress= (numAnxietyLaw * 25) / 100
LawFemaleAnxiety = numAnxietyLaw - LawMaleAnxiety
ComMaleAnxiety = numAnxietyCom - ComFemaleAnxiety
BusinessFemaleAnxiety = numAnxietyBusiness - BusinessMaleAnxiety
AccMaleAnxiety = numAnxietyAcc - AccFemaleAnxiety
numDepressLaw = (PercentLawDepress/32) * 100;
numDepressCom = (PercentComDepress/32) * 100;
totalBusinessAcc = 32 - (numDepressLaw+numDepressCom)
numDepressBusiness = totalBusinessAcc /2
numDepressAcc = totalBusinessAcc /2
PercentBusinessAccDepress = (numDepressAcc * 32) / 100
LawFemaleDepress = numDepressLaw - LawMaleDepress
ComMaleDepress= numDepressCom - ComFemaleDepress
BusinessFemaleDepress = numDepressBusiness - BusinessMaleDepress
AccMaleDepress = numDepressAcc – AccFemaleDepress

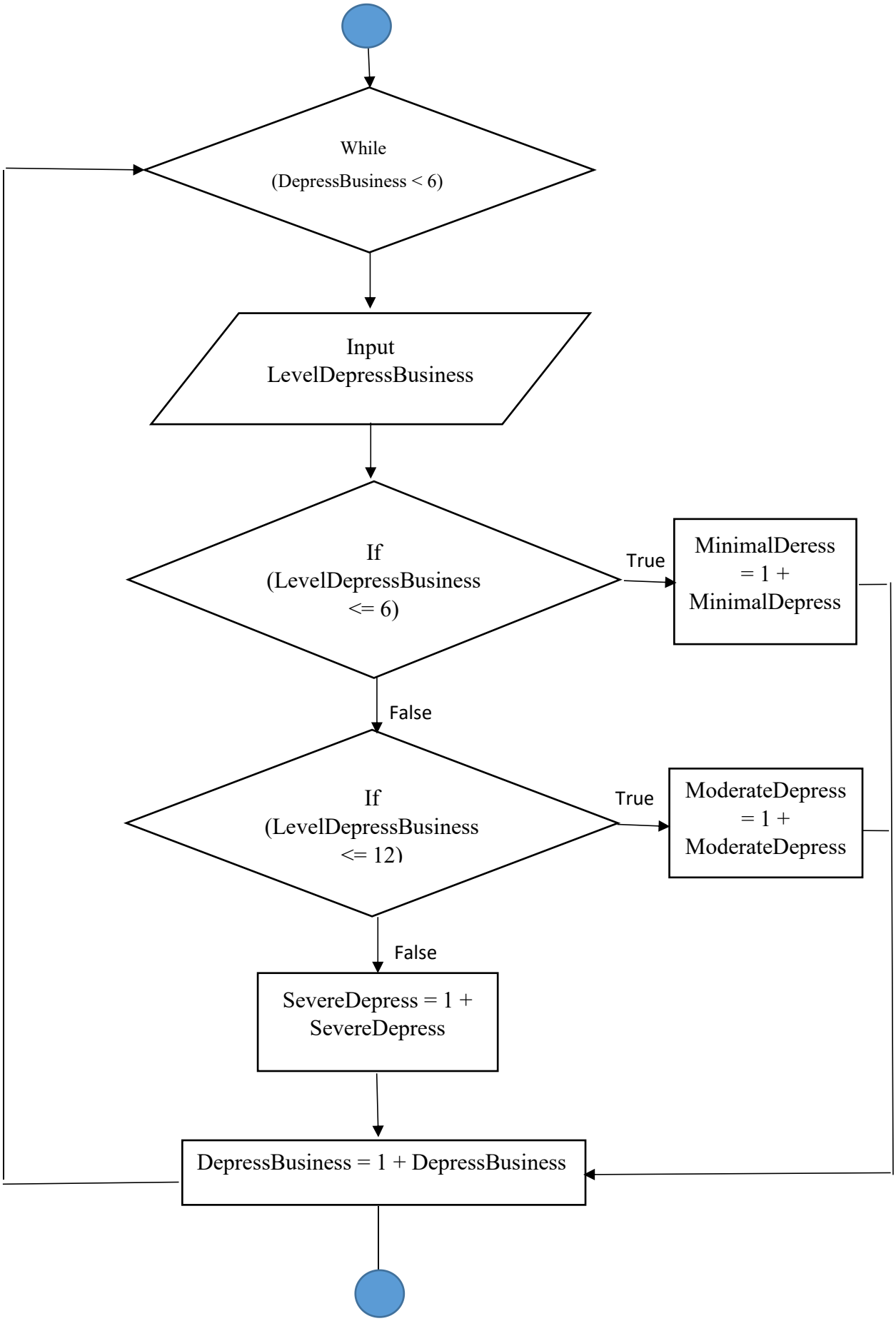
While (AnxietyBusiness < 6)
    Input LevelAnxietyBusiness
    If (LevelAnxietyBusiness <= 5)

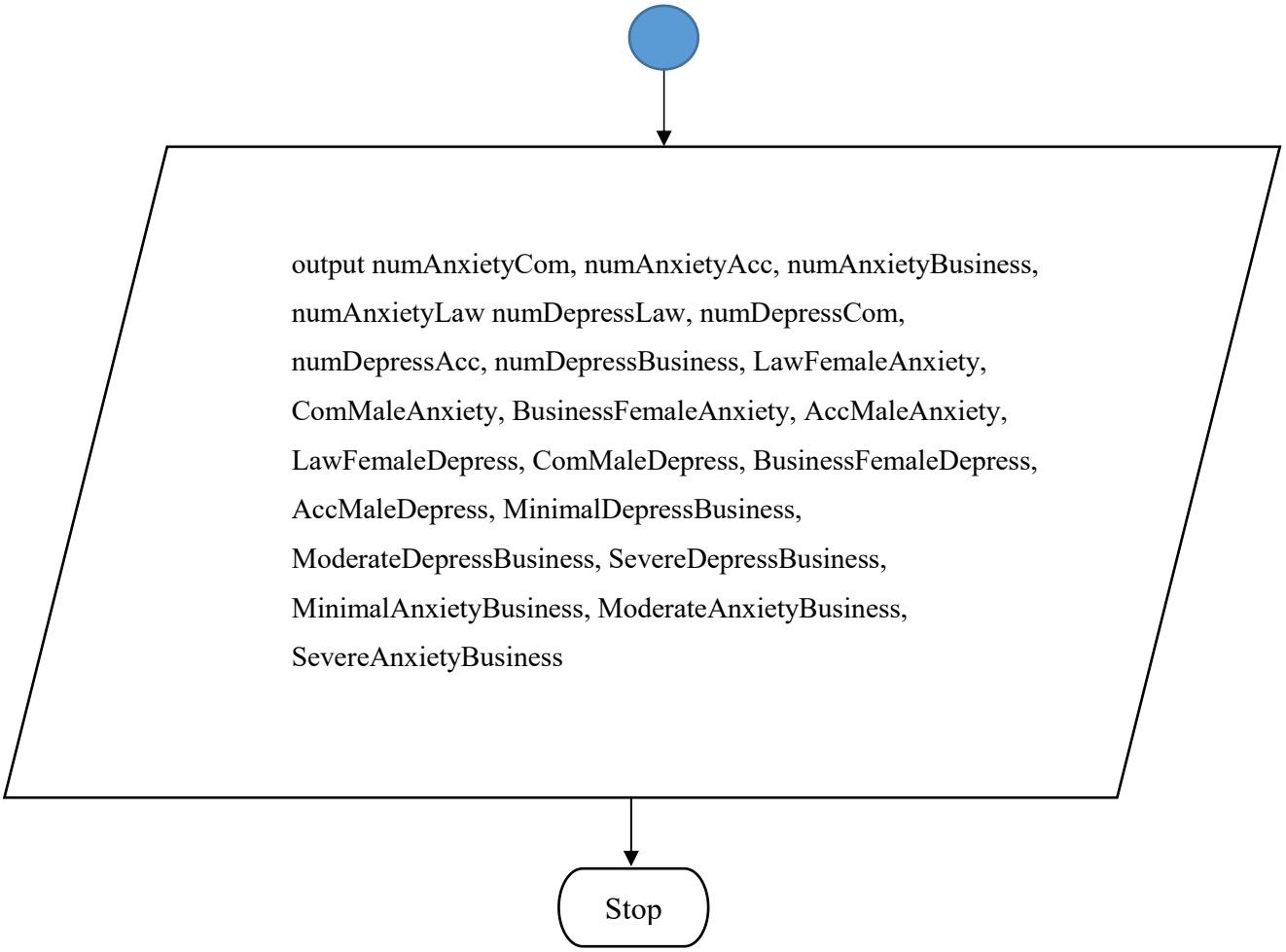
```
            MinimalAnxiety = 1 + MinimalAnxiety
        Else if (LevelAnxietyBusiness <= 10)
            ModerateAnxiety = 1 + ModerateAnxiety
        Else
            SevereAnxiety = 1 + SevereAnxiety
        End if
    AnxietyBusiness = 1 + AnxietyBusiness

    While (DepressBusiness < 7)
        Input LevelDepressBusiness
        If (LevelDepressBusiness <= 6)
            MinimalDepress = 1 + MinimalDepress
        Else if (LevelDepressBusiness <= 12)
            ModerateDepress = 1 + ModerateDepress
        Else
            SevereDepress = 1 + SevereDepress
        End if
    DepressBusiness = 1 + DepressBusiness

    output numAnxietyCom, numAnxietyAcc, numAnxietyBusiness,
    numAnxietyLaw,
    numDepressLaw, numDepressCom, numDepressAcc, numDepressBusiness,
    LawFemaleAnxiety, ComMaleAnxiety, BusinessFemaleAnxiety,
    AccMaleAnxiety, LawFemaleDepress, ComMaleDepress,
    BusinessFemaleDepress, AccMaleDepress,
    MinimalDepressBusiness, ModerateDepressBusiness, SevereDepressBusiness,
    MinimalAnxietyBusiness, ModerateAnxietyBusiness, SevereAnxietyBusiness

    Stop
```

9. Flowchart


Start
input PercentComAnxiety, PercentAccAnxiety,
PercentLawDepress, PercentComDepress, LawMaleAnxiety,
ComFemaleAnxiety, BusinessMaleAnxiety,
AccFemaleAnxiety, LawMaleDepress, ComFemaleDepress,
BusinessMaleDepress, AccFemaleDepress
numAnxietyCom = (PercentComAnxiety/25) * 100
numAnxietyAcc = (PercentAccAnxiety/25) * 100
totalLawBusiness = 25 - (numAnxietyCom+numAxietyAcc)
numAnxietyLaw = totalLawBusiness /2
numAnxietyBusiness = totalLawBusiness /2
PercentLawBusinessDepress= (numAnxietyLaw * 25) / 100
LawFemaleAnxiety = numAnxietyLaw - LawMaleAnxiety
ComMaleAnxiety = numAnxietyCom - ComFemaleAnxiety
BusinessFemaleAnxiety = numAnxietyBusiness - BusinessMaleAnxiety
AccMaleAnxiety = numAnxietyAcc – AccFemaleAnxiety
numDepressLaw = (PercentLawDepress/32) * 100;
numDepressCom = (PercentComDepress/32) * 100;
totalBusinessAcc = 32 - (numDepressLaw+numDepressCom)
numDepressBusiness = totalBusinessAcc /2
numDepressAcc = totalBusinessAcc /2
PercentBusinessAccDepress = (numDepressAcc * 32) / 100
LawFemaleDepress = numDepressLaw - LawMaleDepress
ComMaleDepress= numDepressCom - ComFemaleDepress
BusinessFemaleDepress = numDepressBusiness - BusinessMaleDepress
AccMaleDepress = numDepressAcc - AccFemaleDepress


While
(AnxietyBusiness < 6)
Input
LevelAnxietyBusiness
If
(LevelAnxietyBusiness
<= 5)
True
MinimalAnxiety
= 1 +
MinimalAnxiety
False
If
(LevelAnxietyBusiness
<= 10)
True
ModerateAnxiety
= 1 +
ModerateAnxiety
False
SevereAnxiety = 1 +
SevereAnxiety
AnxietyBusiness = 1 + AnxietyBusiness


While
(DepressBusiness < 6)
Input
LevelDepressBusiness
If
(LevelDepressBusiness
<= 6)
True
MinimalDeress
= 1 +
MinimalDepress
False
If
(LevelDepressBusiness
<= 12)
True
ModerateDepress
= 1 +
ModerateDepress
False
SevereDepress = 1 +
SevereDepress
DepressBusiness = 1 + DepressBusiness


output numAnxietyCom, numAnxietyAcc, numAnxietyBusiness, numAnxietyLaw numDepressLaw, numDepressCom, numDepressAcc, numDepressBusiness, LawFemaleAnxiety, ComMaleAnxiety, BusinessFemaleAnxiety, AccMaleAnxiety, LawFemaleDepress, ComMaleDepress, BusinessFemaleDepress, AccMaleDepress, MinimalDepressBusiness, ModerateDepressBusiness, SevereDepressBusiness, MinimalAnxietyBusiness, ModerateAnxietyBusiness, SevereAnxietyBusiness
Stop

10. Coding – Numerical Computation & Expression

Coding

WEEK 8 ▸ src ▸ assignment1 ▸ UniversityMedical ▸ main(String[]) : void

```
1  package assignment1;
2
3  import java.util.Scanner;
4
5  public class UniversityMedical {
6
7      public static void main(String[] args) {
8          // TODO Auto-generated method stub
9          // Program to calculate no of students
10
11         Scanner sc = new Scanner (System.in);
12
13         double anxiety = 25.0;
14         double depression = 32.0;
15
16         double computingA;
17         double accountA;
18
19         double nlawD ;
20         double ncomputingA;
21         double ncomputingD;
22         double naccountA;
23
24         double lawD;
25         double computingD;
26
27         System.out.println("This program will help you to calculate number of students of different school");
28         System.out.println("");
29         System.out.println("Based on the survey: ");
30         System.out.println("                    -Anxiety test    = " + anxiety + "%");
31         System.out.println("                    -Depression test = " + depression + "%");
32         System.out.println("");
```

```
33
34         System.out.print("Please enter percentage of students have anxiety in School of Computing  = ");
35         computingA = sc.nextDouble();
36         System.out.print("Please enter percentage of students have anxiety in School of Accounting = ");
37         accountA = sc.nextDouble();
38         System.out.println("");
39
40         System.out.println("Percentage of students in School of Computing who have anxiety  = " + computingA + "%");
41         ncomputingA = (computingA/25) * 100;
42         System.out.println("Percentage of students in School of Accounting who have anxiety = " + accountA + "%");
43         naccountA = (accountA/25) * 100;
44
45         double nlb = 25 - (ncomputingA+naccountA)  ;
46         double nlawA = nlb/2 ;
47         double nbusinessA = nlb/2 ;
48         double lbpercent = (nlawA * 25) / 100 ;
49
50         System.out.println("Percentage of students in School of Law who have anxiety        = " + lbpercent + "%");
51         System.out.println("Percentage of students in School of Business who have anxiety   = " + lbpercent + "%");
52         System.out.println("");
53
54         System.out.print("Please enter percentage of students have depression in School of Law       = ");
55         lawD = sc.nextDouble();
56         System.out.print("Please enter percentage of students have depression in School of Computing = ");
57         computingD = sc.nextDouble();
58         System.out.println("");
59
60         System.out.println("Percentage of students in School of Law who have depression          = " + lawD + "%");
61         nlawD = (lawD/32) * 100;
62         System.out.println("Percentage of students in School of Computing who have depression    = " + computingD + "%");
63         ncomputingD = (computingD/32) * 100;
64
```

```
65         double nba = 32 - (nlawD+ncomputingD)  ;
66         double nbusinessD = nba/2 ;
67         double naccountD = nba/2 ;
68         double bapercent = (naccountD * 32) / 100 ;
69
70         int a = (int) nlawA;
71         int b = (int) ncomputingA;
72         int c = (int) nbusinessA;
73         int d = (int) naccountA;
74
75         int e = (int) nlawD;
76         int f = (int) ncomputingD;
77         int g = (int) nbusinessD;
78         int h = (int) naccountD;
79
80         int aM =  0;
81         int bF =  6;
82         int cM =  1;
83         int dF =  4;
84         int eM =  4;
85         int fF =  5;
86         int gM =  2;
87         int hF =  3;
88
89         int aF = a - 0;
90         int bM = b - 6;
91         int cF = c - 1;
92         int dM = d - 4;
93
94         int eF = e - 4;
95         int fM = f - 5;
96         int gF = g - 2;
97         int hM = h - 3;
98
```

```
        System.out.println("Percentage of students in School of Business who have depression     = " + bapercent + "%");
        System.out.println("Percentage of students in School of Accounting who have depression   = " + bapercent + "%");
        System.out.println("");

        System.out.println("Here is the result : ");
        System.out.println(" ");
        System.out.println("Anxiety Test");
        System.out.println(" ");
        System.out.println(" ---------------------- " + " ---------------------------- " + " ---------------------------- " + " ------
        System.out.println("|        School        |" + "| Percentage of students(%) |" + "| Total Number of students |" + "| Female
        System.out.println("|     School of Law    |" + "|            " + lbpercent +  "          |" + "|            "+   a +"
        System.out.println("|  School of Computing |" + "|            " + computingA + "          |" + "|            "+   b +"
        System.out.println("|  School of Business  |" + "|            " + lbpercent +  "          |" + "|            "+   c +"
        System.out.println("| School of Accounting |" + "|            " + accountA +   "          |" + "|            "+    d +"
        System.out.println(" ---------------------- " + " ---------------------------- " + " ---------------------------- " + " ------

        System.out.println(" ");
        System.out.println("Depression Test");
        System.out.println(" ");
        System.out.println(" ---------------------- " + " ---------------------------- " + " ---------------------------- " + " ------
        System.out.println("|        School        |" + "| Percentage of students(%) |" + "| Total Number of students |" + "| Female
        System.out.println("|     School of Law    |" + "|            " + lawD +  "          |" + "|            "+   e +"
        System.out.println("|  School of Computing |" + "|            " + computingD + "          |" + "|            "+   f +"
        System.out.println("|  School of Business  |" + "|            " + bapercent +  "          |" + "|            "+   g +"
        System.out.println("| School of Accounting |" + "|            " + bapercent +  "          |" + "|            "+    h +"
        System.out.println(" ---------------------- " + " ---------------------------- " + " ---------------------------- " + " ------


        sc.close();

    }
}
```

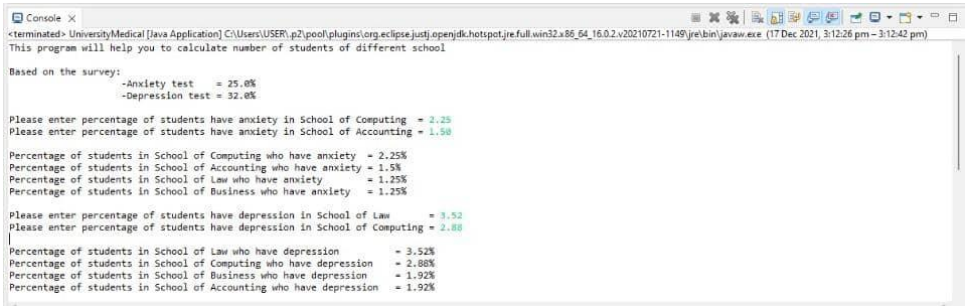


```
        System.out.println("Data below show the level of anxiety and depression of a student");
        System.out.println("Anxiety level : ");
        System.out.println("                0-5   -> minimal anxiety");
        System.out.println("                6-10  -> moderate anxiety");
        System.out.println("                11-20 -> severe anxiety");
        System.out.println();
        System.out.println("Depression level : ");
        System.out.println("               1-6 -> minimal depression");
        System.out.println("               7-12 -> moderate depression");
        System.out.println("               13-20 -> severe depression");
        System.out.println();
        System.out.println("Based on the table:");
        System.out.println();
        System.out.println("This data will show for student in School of Business who have anxiety");
        System.out.println();

        int aB = 1;
        int minAB = 0;
        int modAB = 0;
        int sevAB = 0;
        while (aB<6) {

                System.out.print("Result for the " +aB+ " student (0-20) = ");
                int levelAB = sc.nextInt();

                if (levelAB <= 5) {
                     minAB += 1;
                     }
                else if (levelAB <= 10 ) {
                     modAB += 1;}
                else {
                     sevAB += 1;}
                aB++;

        }
```

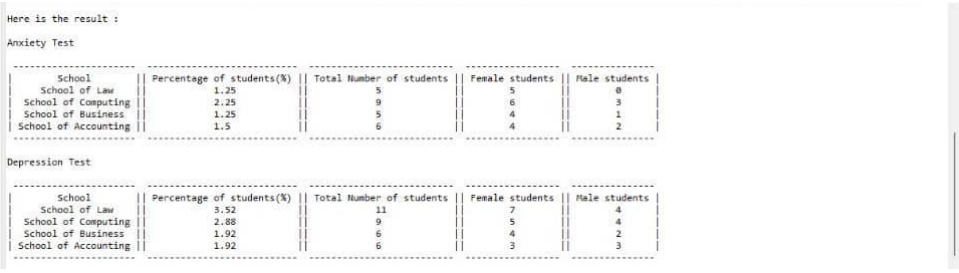


```
        }
        System.out.println(minAB + " out of " + c + " students in School of Business has minimal anxiety");
        System.out.println(modAB + " out of " + c + " students in School of Business has moderate anxiety");
        System.out.println(sevAB + " out of " + c + " students in School of Business has severe anxiety");

        System.out.println();
        System.out.println("This data will show for student in School of Business who have depression");
        System.out.println();

        int dB = 1;
        int minDB = 0;
        int modDB = 0;
        int sevDB = 0;
        while (dB<7) {

                System.out.print("Result for the " +dB+ " student (0-20) = ");
                int levelDB = sc.nextInt();

                if (levelDB <= 6) {
                     minDB += 1;
                     }
                else if (levelDB <= 12 ) {
                     modDB += 1;}
                else {
                     sevDB += 1;}
                dB++;

        }
        System.out.println(minDB + " out of " + g + " students in School of Business has minimal depression");
        System.out.println(modDB + " out of " + g + " students in School of Business has moderate depression");
        System.out.println(sevDB + " out of " + g + " students in School of Business has severe depression");

    }
}
```

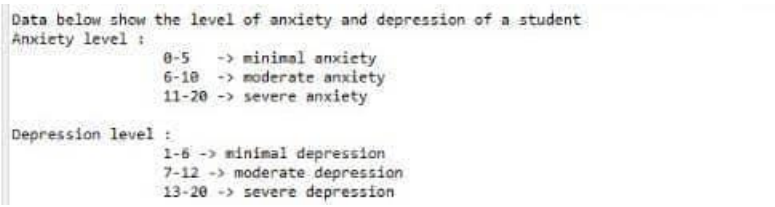
Output



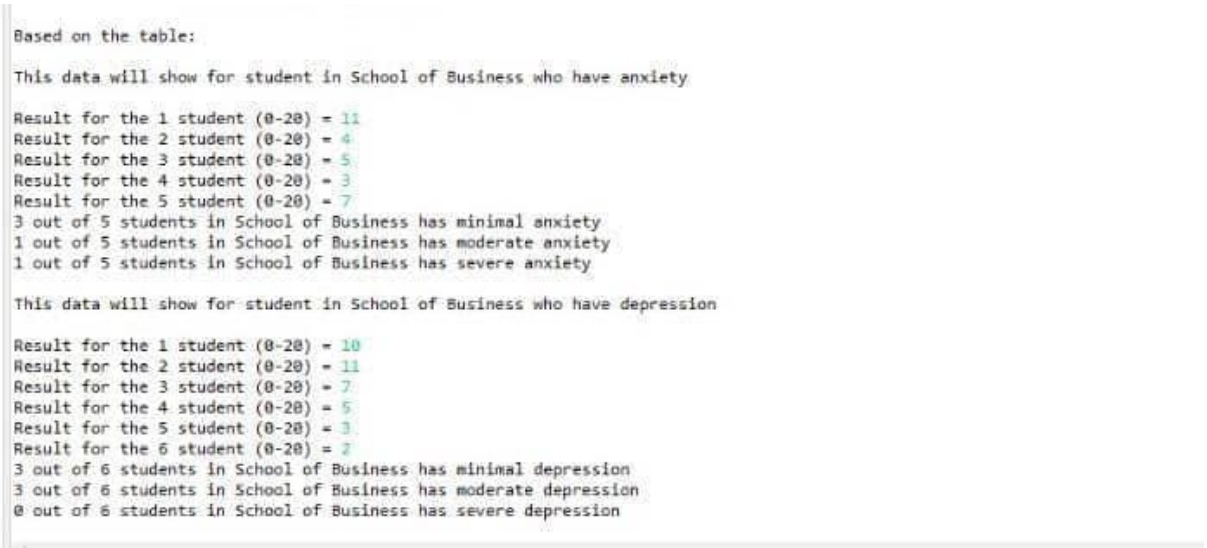
```
Console ×
<terminated> UniversityMedical [Java Application] C:\Users\USER\.p2\pool\plugins\org.eclipse.justj.openjdk.hotspot.jre.full.win32.x86_64_16.0.2.v20210721-1149\jre\bin\javaw.exe (17 Dec 2021, 3:12:26 pm – 3:12:42 pm)
This program will help you to calculate number of students of different school

Based on the survey:
                -Anxiety test    = 25.0%
                -Depression test = 32.0%

Please enter percentage of students have anxiety in School of Computing  = 2.25
Please enter percentage of students have anxiety in School of Accounting = 1.50

Percentage of students in School of Computing who have anxiety  = 2.25%
Percentage of students in School of Accounting who have anxiety = 1.5%
Percentage of students in School of Law who have anxiety        = 1.25%
Percentage of students in School of Business who have anxiety   = 1.25%

Please enter percentage of students have depression in School of Law       = 3.52
Please enter percentage of students have depression in School of Computing = 2.88

Percentage of students in School of Law who have depression          = 3.52%
Percentage of students in School of Computing who have depression    = 2.88%
Percentage of students in School of Business who have depression     = 1.92%
Percentage of students in School of Accounting who have depression   = 1.92%
```



```
Here is the result :

Anxiety Test

 --------------------  -------------------------  -------------------------  ----------------  --------------
|       School       || Percentage of students(%) || Total Number of students || Female students || Male students |
|     School of Law  ||           1.25           ||           5             ||        5        ||        0      |
|  School of Computing ||          2.25           ||           9             ||        6        ||        3      |
|  School of Business  ||          1.25           ||           5             ||        4        ||        1      |
| School of Accounting ||          1.5            ||           6             ||        4        ||        2      |
 --------------------  -------------------------  -------------------------  ----------------  --------------

Depression Test

 --------------------  -------------------------  -------------------------  ----------------  --------------
|       School       || Percentage of students(%) || Total Number of students || Female students || Male students |
|     School of Law  ||           3.52           ||           11            ||        7        ||        4      |
|  School of Computing ||          2.88           ||           9             ||        5        ||        4      |
|  School of Business  ||          1.92           ||           6             ||        4        ||        2      |
| School of Accounting ||          1.92           ||           6             ||        3        ||        3      |
 --------------------  -------------------------  -------------------------  ----------------  --------------
```



```
Data below show the level of anxiety and depression of a student
Anxiety level :
                0-5   -> minimal anxiety
                6-10  -> moderate anxiety
                11-20 -> severe anxiety

Depression level :
                1-6 -> minimal depression
                7-12 -> moderate depression
                13-20 -> severe depression
```



```
Based on the table:

This data will show for student in School of Business who have anxiety

Result for the 1 student (0-20) = 11
Result for the 2 student (0-20) = 4
Result for the 3 student (0-20) = 5
Result for the 4 student (0-20) = 3
Result for the 5 student (0-20) = 7
3 out of 5 students in School of Business has minimal anxiety
1 out of 5 students in School of Business has moderate anxiety
1 out of 5 students in School of Business has severe anxiety

This data will show for student in School of Business who have depression

Result for the 1 student (0-20) = 10
Result for the 2 student (0-20) = 11
Result for the 3 student (0-20) = 7
Result for the 4 student (0-20) = 5
Result for the 5 student (0-20) = 3
Result for the 6 student (0-20) = 2
3 out of 6 students in School of Business has minimal depression
3 out of 6 students in School of Business has moderate depression
0 out of 6 students in School of Business has severe depression
```