ASSIGNMENT 1

1. **Write a C++ program to calculate Car parking tickets.**

    a. Draw a flowchart for this program

    b. Allow the user to input the number of hours for multiple customers using a loop.

    c. After calculating the total cost for each customer, ask if the user wants to enter details for another customer.

    d. Use a function calculateParkingFee to calculate the total car parking ticket based on RM 1.20 per hour.
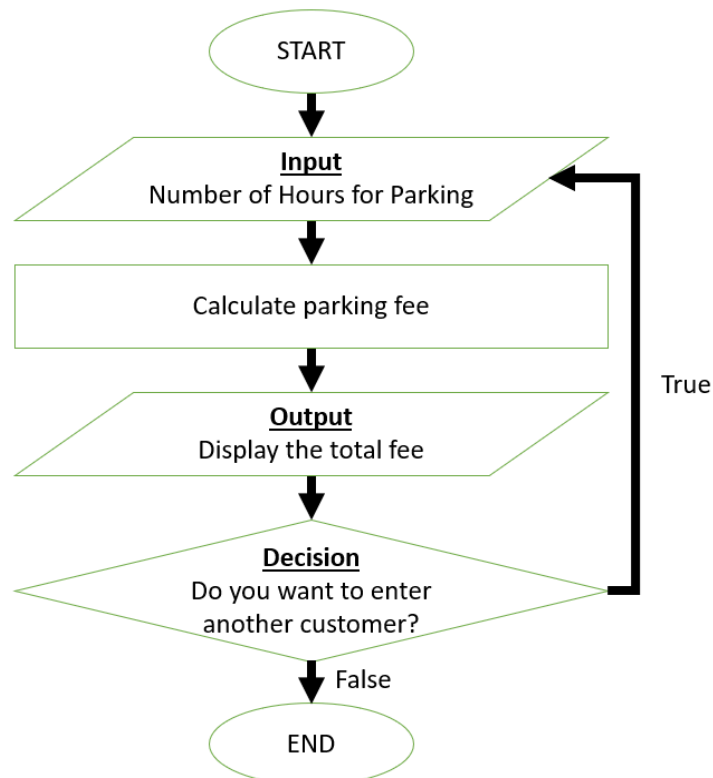
    Example:

    Input: 3 hours

    Output: Total parking ticket: RM 3.60

    Prompt: "Do you want to enter another customer? (y/n)"

Flowchart:

Coding:

```cpp
#include <iostream>
#include <iomanip>

using namespace std;

float calculateParkingFee(float hours) {
    const float ratePerHour = 1.20;
    return hours * ratePerHour;
}

int main() {
    char choice;
    do {
        float hours;

        cout << "Enter the number of hours for parking: ";
        cin >> hours;

        if(hours < 0) {
            cout << "Invalid input. Hours cannot be negative." << endl;
            continue;
        }

        float totalFee = calculateParkingFee(hours);

        cout << "Total parking ticket: RM " << setprecision(2) << fixed << totalFee << endl;

        cout << "Do you want to enter another customer? (y/n): ";
        cin >> choice;

    } while(choice == 'y' || choice == 'Y');

    cout << "Thank you for using the parking fee calculator." << endl;
    return 0;
}
```

Output:

choose 'y' (yes)

```
Enter the number of hours for parking: 3
Total parking ticket: RM 3.60
Do you want to enter another customer? (y/n): y
Enter the number of hours for parking: 3
Total parking ticket: RM 3.60
Do you want to enter another customer? (y/n): n
Thank you for using the parking fee calculator.

----------------------------------
Process exited after 7.071 seconds with return value 0
Press any key to continue . . .
```

choose 'n' (no)

```
Enter the number of hours for parking: 3
Total parking ticket: RM 3.60
Do you want to enter another customer? (y/n): n
Thank you for using the parking fee calculator.

----------------------------------
Process exited after 37.8 seconds with return value 0
Press any key to continue . . .
```

2. **Write a C++ program to calculate Body Mass Index (BMI) based on weight and height.**

    a. Draw a flowchart for this program

    b. Allow the user to input their weight (in kg) and height (in meters).

    c. Display BMI classification status according to the following table:

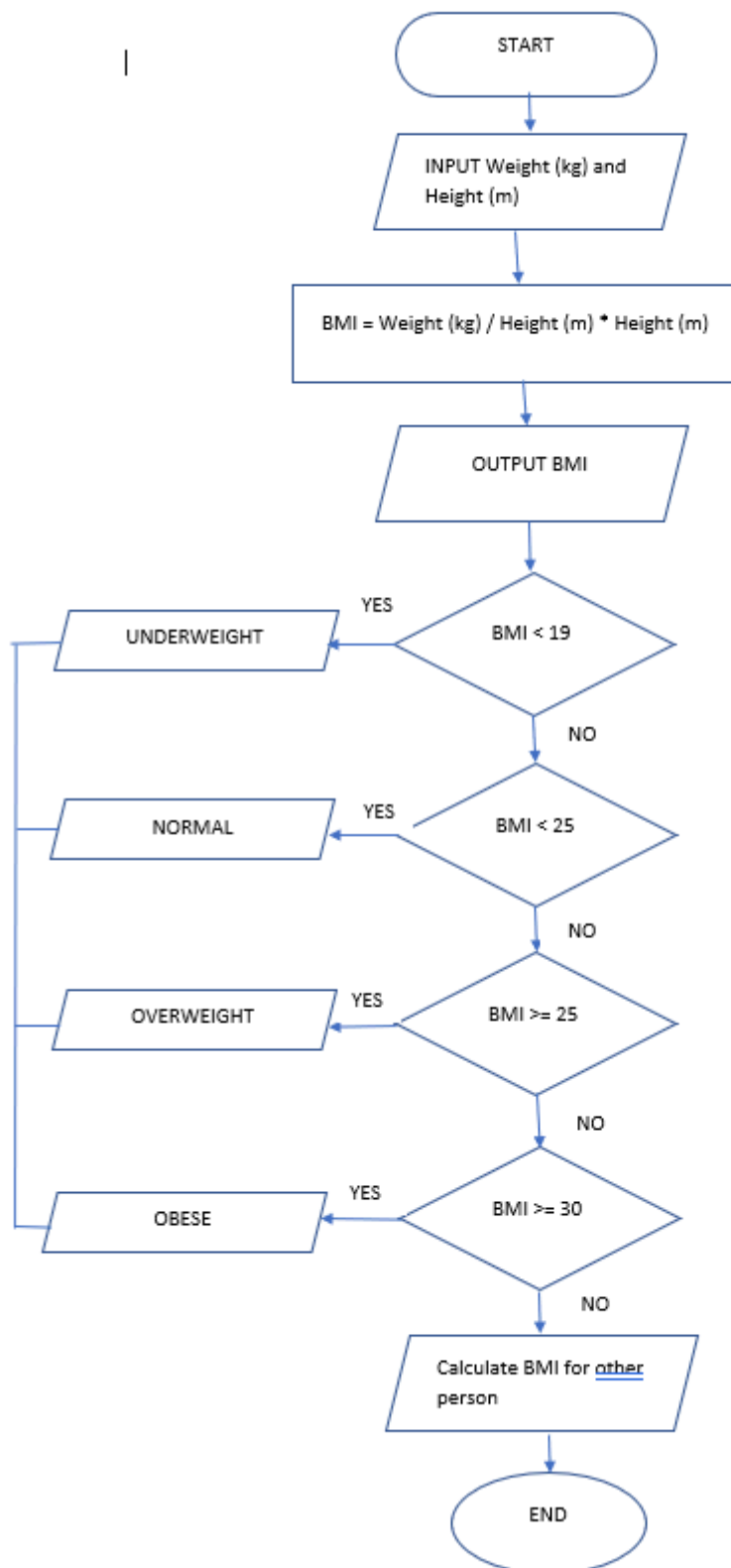| Classification	BMI
Underweight	<19
Normal	<25
Overweight	>=25
Obese	>=30

    d. Use a function calculateBMI to compute the BMI.

    e. Calculate BMI using formula:

$$BMI = \frac{Berat(kg)}{Tinggi(m) x Tinggi(m)}$$

Figure 1: BMI Formula

    f. Use a loop to allow multiple BMI calculations for different users.

    g. After displaying the BMI classification, ask if the user wants to calculate BMI for another person.

Flowchart:

START

INPUT Weight (kg) and Height (m)

BMI = Weight (kg) / Height (m) * Height (m)

OUTPUT BMI

BMI < 19 — YES → UNDERWEIGHT
NO

BMI < 25 — YES → NORMAL
NO

BMI >= 25 — YES → OVERWEIGHT
NO

BMI >= 30 — YES → OBESE
NO

Calculate BMI for other person

END

Coding:

```cpp
1   #include <iostream>
2
3   void calculateBMI();
4   void checkBMI(float bmi);
5   void operater();
6
7   float weight, height, bmi;
8   char op;
9
10  int main() {
11      calculateBMI();
12      return 0;
13  }
14
15  void calculateBMI(){
16      std::cout<<"weight(kg):";
17      std::cin>>weight;
18      std::cout<<"height(m):";
19      std::cin>>height;
20      bmi= weight / (height * height);
21      std::cout <<"Your bmi is "<<bmi<<"\n";
22      checkBMI(bmi);
23  }
24
25  void checkBMI(float bmi){
26      if (bmi < 19) {
27          std::cout << "underweight"<<"\n";
28      }else if(bmi >= 19 && bmi <25){
29          std::cout << "normal"<<"\n";
30      }else if(bmi >= 25 && bmi <=30){
31          std::cout << "Overweight"<<"n";
32      }else {
```

```cpp
33              std::cout << "Obese\n";
34          }
35          operater();
36      }
37
38  void operater(){
39          std::cout<<"countinue ?(y/n)"<<"\n";
40          std::cin>>op;
41          switch(op){
42              case'y':
43              calculateBMI();
44              break;
45
46              case'n':
47              break;
48
49              default:
50              return operater();
51              std::cout<<"PLease enter y or n"<<"\n";
52              break;
53          }
54
55
56  }
```

Output:

```
weight(kg):89
height(m):1.69
Your bmi is 31.1614
Obese
countinue ?(y/n)
y
weight(kg):60
height(m):1.80
Your bmi is 18.5185
underweight
countinue ?(y/n)
n


--------------------------------
Process exited after 20.72 seconds with return value 0
Press any key to continue . . . |
```
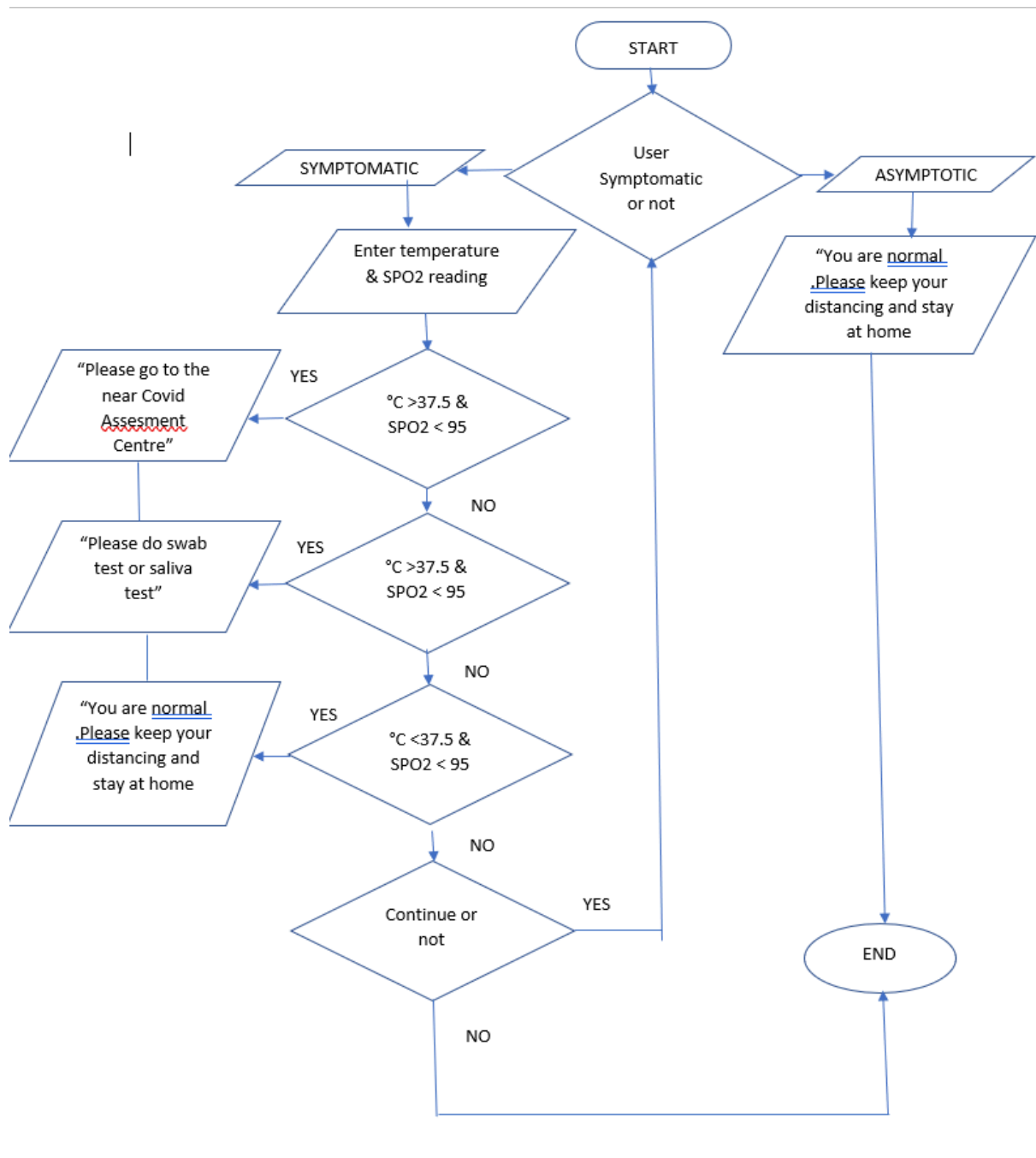
3. **Write C++ program for COVID 19 detection system**

   a. Draw a flowchart for this program.

   b. This program will allow ask user either

      i. Symptomatic

      ii. Asymptotic

   c. If user is symptomatic

      i. Ask user to enter temperature and SPO_2 reading

         1. If temperature >37.5 and SPO_2 reading less than 95

            a. Display "Please go to the near Covid Assessment Centre (CAC)"

         2. If temperature >37.5 or SPO_2 reading less than 95

            a. Display "Please do Swab test or saliva test

         3. If temperature If temperature <37.5 and SPO_2 reading less than 95

            a. Display "You are normal. Please keep your social distancing and Stay at home"

      ii. Use a function checkSymptoms to display the appropriate message based on the conditions.

   d. If user is asymptotic

      i. Display "You are normal. Please keep your social distancing and Stay at home"

   e. Repeat the loop for another person.

Flowchart:

START

User Symptomatic or not

SYMPTOMATIC

ASYMPTOTIC

Enter temperature & SPO2 reading

"You are normal .Please keep your distancing and stay at home

°C >37.5 & SPO2 < 95

YES — "Please go to the near Covid Assesment Centre"

NO

°C >37.5 & SPO2 < 95

YES — "Please do swab test or saliva test"

NO

°C <37.5 & SPO2 < 95

YES — "You are normal .Please keep your distancing and stay at home

NO

Continue or not

YES

NO

END

Coding:

```cpp
#include <iostream>

void SorA();
void checkSymptomatic();
void operater();
float temperature;
int SPO2 ;
char op, sa;

int main(){
    SorA();

}

void SorA(){
    std::cout<<"please enter 1 or 2 \n";
    std::cout<<"1. Symptomatic \n";
    std::cout<<"2. Asymptotic \n";
    std::cin>> sa;
    switch (sa){
        case '1':
        checkSymptomatic();
        break;

        case '2':
        std::cout<<"You are normal. Please keep your social distancing and Stay at home \n";
        operater();
        break;

        default:
        SorA();
        break;
    }
}

void checkSymptomatic(){
    std::cout<<"Press enter temperature \n";
    std::cin>> temperature;
    std::cout<<"Press enter SPO2 reading \n";
    std::cin>> SPO2;
    if (temperature > 37.5 && SPO2 <=95){
        std::cout<<"Please go to the near Covid Assessment Centre(CAC) \n";
        operater();
    }
    else if (temperature > 37.5 || SPO2 <=95){
        std::cout<<"Please do Swab test or saliva test \n";
        operater();
    }
    else if (temperature<= 37.5 && SPO2 <=95){
        std::cout<<"You are normal. Please keep your social distancing and Stay at home \n";
        operater();
    }
    else if (temperature<= 37.5 && SPO2 >=95){
        std::cout<<"You are normal. Please keep your social distancing and Stay at home \n";
        operater();
    }else {
        std::cout<<"ERROR:Are You HUMAN ??? \n"; // looping error
        operater();
    }
}
```

```cpp
62
63  void operater(){
64      std::cout<<"countinue ?(y/n)"<<"\n";
65      std::cin>>op;
66      switch(op){
67          case'y':
68          SorA();
69          break;

71          case'n':
72          break;

74          default:
75          return operater();
76          std::cout<<"PLease enter y or n"<<"\n";
77          break;
78      }

80  }
81
82
```

Output:

```
please enter 1 or 2
1. Symptomatic
2. Asymptotic
2
You are normal. Please keep your social distancing and Stay at home
countinue ?(y/n)
y
please enter 1 or 2
1. Symptomatic
2. Asymptotic
1
Press enter temperature
37
Press enter SPO2 reading
95
Please do Swab test or saliva test
countinue ?(y/n)
```