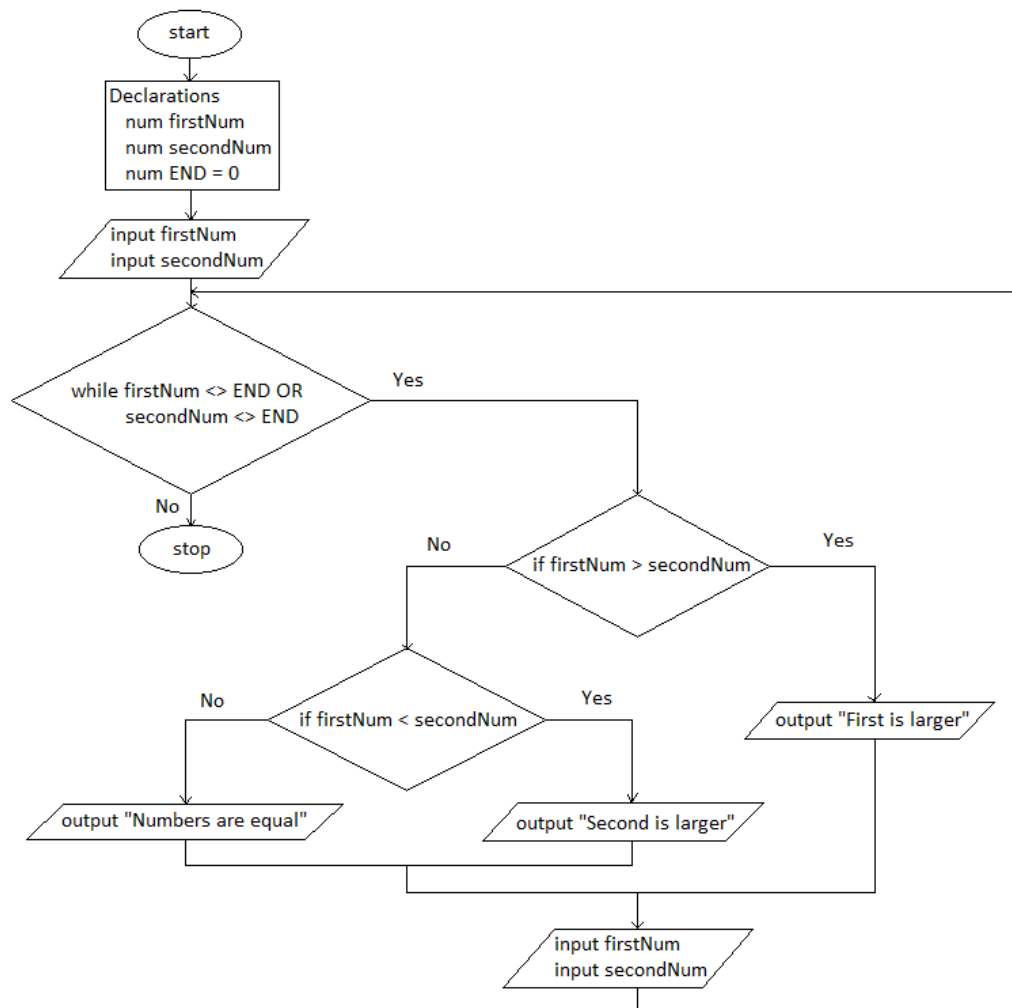# Chapter 4 Farrell Exercises Programs 15-16

Program 15 Flowchart & Pseudocode

```
start
    Declarations
        num firstNum
        num secondNum
        num END = 0

    input firstNum
    input secondNum

    while firstNum or secondNum is not equal to END is true
        if firstNum greater than secondNum is true then
            output "First is larger"
        else
            if firstNum less than secondNum is true then
                output "Second is larger"
            else
                output "Numbers are equal"
            endif
        endif
        input firstNum
        input secondNum
    endwhile
stop
```

Program 15 Code

```cpp
#include <iostream>
using namespace std;
int main()
{
    double firstNum;
    double secondNum;
    double END = 0;

    cout << "Input " << END << " for both to end." << endl << endl;
    cout << "Input first number: ";
    cin >> firstNum;
    cout << "Input second number: ";
    cin >> secondNum;
    cout << endl;

    while(firstNum != END || secondNum != END)
    {
        if(firstNum > secondNum)
        {
            cout << "First is larger" << endl << endl;
        }
        else
        {
            if(firstNum < secondNum)
            {
                cout << "Second is larger" << endl << endl;
            }
            else
            {
                cout << "Numbers are equal" << endl << endl;
            }
        }
        cout << endl;
        cout << "Input first number: ";
        cin >> firstNum;
        cout << "Input second number: ";
        cin >> secondNum;
        cout << endl;
    }
    cout << "Numbers are equal" << endl << endl;
    cout << endl << "Code by Jacob Smetana" << endl;
    return 0;
}
```

Console output:

```
"C:\Users\Nii-san\Desktop\prog fund 1\Chapter 4\Farrell Exercises\Program 15.ex
Input 0 for both to end.

Input first number: 10
Input second number: 5

First is larger

Input first number: 7
Input second number: 13

Second is larger

Input first number: 21
Input second number: 21

Numbers are equal

Input first number: 0
Input second number: 0

Numbers are equal

Code by Jacob Smetana
Process returned 0 (0x0)   execution time : 13.627 s
Press any key to continue.
```
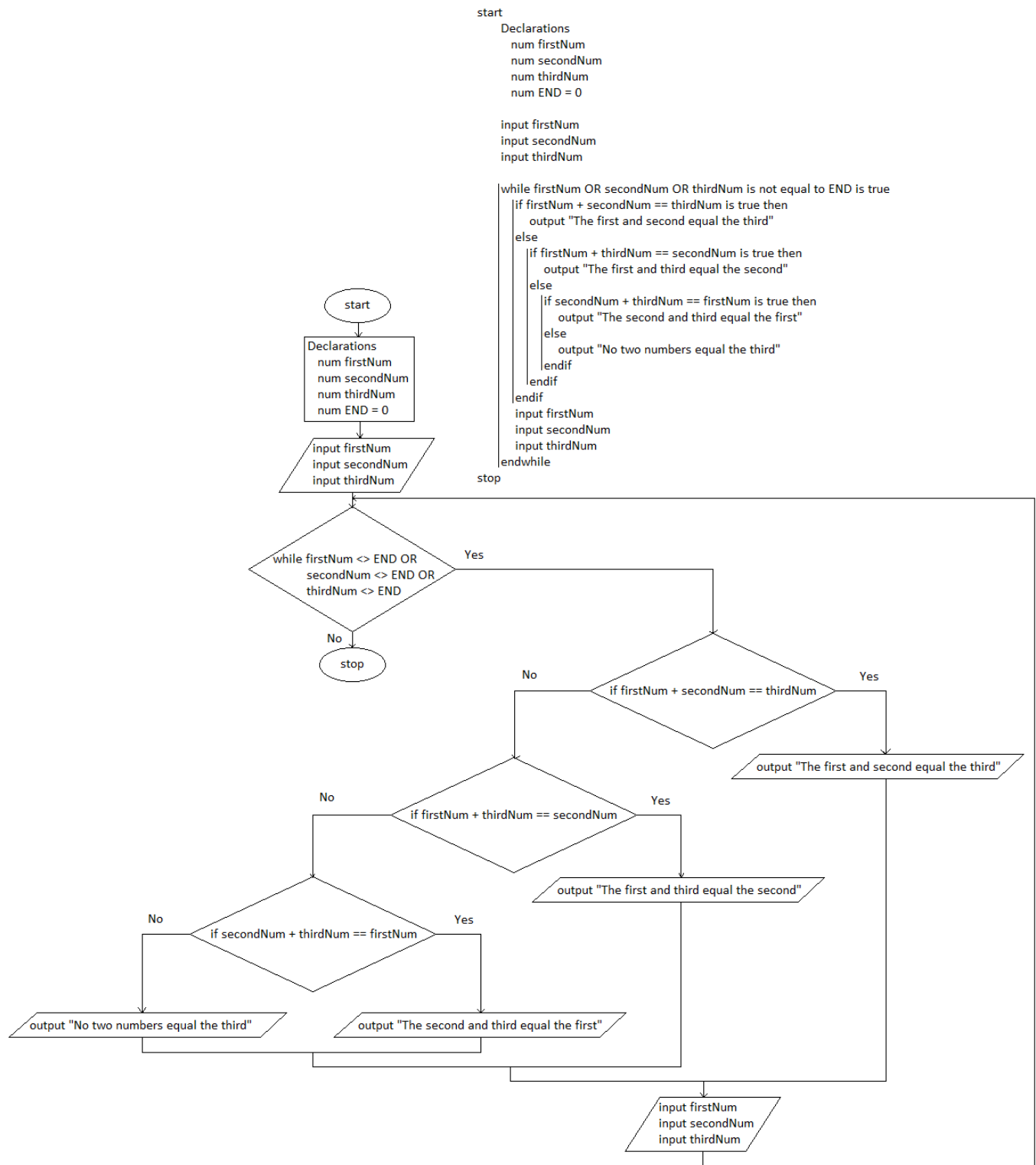
Program 16 Flowchart & Pseudocode

```
start
    Declarations
        num firstNum
        num secondNum
        num thirdNum
        num END = 0

    input firstNum
    input secondNum
    input thirdNum

    while firstNum OR secondNum OR thirdNum is not equal to END is true
        if firstNum + secondNum == thirdNum is true then
            output "The first and second equal the third"
        else
            if firstNum + thirdNum == secondNum is true then
                output "The first and third equal the second"
            else
                if secondNum + thirdNum == firstNum is true then
                    output "The second and third equal the first"
                else
                    output "No two numbers equal the third"
                endif
            endif
        endif
        input firstNum
        input secondNum
        input thirdNum
    endwhile
stop
```

start

Declarations
   num firstNum
   num secondNum
   num thirdNum
   num END = 0

input firstNum
input secondNum
input thirdNum

while firstNum <> END OR secondNum <> END OR thirdNum <> END — Yes → if firstNum + secondNum == thirdNum — Yes → output "The first and second equal the third"

No → stop

if firstNum + secondNum == thirdNum — No → if firstNum + thirdNum == secondNum — Yes → output "The first and third equal the second"

if firstNum + thirdNum == secondNum — No → if secondNum + thirdNum == firstNum — Yes → output "The second and third equal the first"

if secondNum + thirdNum == firstNum — No → output "No two numbers equal the third"

input firstNum
input secondNum
input thirdNum

Program 16 Code

```cpp
#include <iostream>
using namespace std;
int main()
{
    double firstNum;
    double secondNum;
    double thirdNum;
    double END = 0;

    cout << "Input " << END << " for all three to end." << endl << endl;
    cout << "Input first number: ";
    cin >> firstNum;
    cout << "Input second number: ";
    cin >> secondNum;
    cout << "Input third number: ";
    cin >> thirdNum;
    cout << endl;

    while(firstNum != END || secondNum != END || thirdNum != END)
    {
        if(firstNum + secondNum == thirdNum)
        {
            cout << "The first and second equal the third." << endl;
        }
        else
        {
            if(firstNum + thirdNum == secondNum)
            {
                cout << "The first and third equal the second." << endl;
            }
            else
            {
                if(secondNum + thirdNum == firstNum)
                {
                    cout << "The second and third equal the first." << endl;
                }
                else
                {
                    cout << "No two numbers equal the third" << endl;
                }
            }
        }
        cout << endl << endl;
        cout << "Input first number: ";
        cin >> firstNum;
        cout << "Input second number: ";
        cin >> secondNum;
        cout << "Input third number: ";
        cin >> thirdNum;
        cout << endl;
    }
    cout << endl << "Code by Jacob Smetana" << endl;
    return 0;
}
```

```
"C:\Users\Nii-san\Desktop\prog fund 1\Chapter 4\Farrell Exercises\Program 16.e
Input 0 for all three to end.

Input first number: 5
Input second number: 5
Input third number: 10

The first and second equal the third.

Input first number: 5
Input second number: 10
Input third number: 5

The first and third equal the second.

Input first number: 10
Input second number: 5
Input third number: 5

The second and third equal the first.

Input first number: 0
Input second number: 5
Input third number: 0

No two numbers equal the third

Input first number: 0
Input second number: 0
Input third number: 0

Code by Jacob Smetana

Process returned 0 (0x0)   execution time : 11.870 s
Press any key to continue.
```