Activity No. 3.1	
Control Structures (part 2)	
Course Code: CPE010	**Program:** Computer Engineering
Course Title: Data Structures and Algorithms	**Date Performed:** 8|18|25
Section: CPE11S1	**Date Submitted:** 8|18|25
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6. Output	

1. Develop a C++ program that will determine if a department store customer has exceeded the credit limit on a charge account. For each customer, the following facts are available:
    1. Account number
    2. Balance at the beginning of the month
    3. Total of all items charged by this customer this month
    4. Total of all credits applied to this customer's account this month
    5. Allowed credit limit

The program should input each of these facts, calculate the new balance (=*beginning balance +charges -credits),* and determine if the new balance exceeds the customer's credit limit. For those customers whose credit limit is exceeded, the program should display the customer's account number, credit limit, new balance and the message "Credit limit exceeded."

Sample output:

Enter account number (-1 to end): 100

Enter beginning balance: 5394.78

Enter total charges: 1000.00

Enter total credits: 500.00

Enter credit limit: 5500.00

Account: 100

Credit limit: 5500.00

Balance: 5894.78

Credit Limit Exceeded.

Enter account number (-1 to end): 200

Enter beginning balance: 1000.00

Enter total charges: 123.45

Enter total credits: 321.00

Enter credit limit: 1500.00

Enter account number (-1 to end): 300

Enter beginning balance: 500.00

Enter total charges: 274.73

Enter total credits: 100.00

Enter credit limit: 800.00

Enter account number (-1 to end): -1

Program ends.

```cpp
#include <iostream>
#include <iomanip> //for std::fixed and std::setprecision

int main () {
    int accNUM = 0;
    double beginningBal, totalChar, totalCred, creditLimit, newBal;

    std::cout << std::fixed << std::setprecision(2); // Format to 2 decimal places

    while (true){

        std::cout << "Enter Account Number: " ;
        std::cin >> accNUM;
        if (accNUM == -1) {
            break;
        }


        std::cout << "Enter Beginning Balance: " ;
        std::cin >> beginningBal;

        std::cout << "Enter Total Charges: ";
        std::cin >> totalChar;

        std::cout << "Enter Total Credits: ";
        std::cin >> totalCred;

        std::cout << "Enter Credit Limit: ";
        std::cin >> creditLimit;


        newBal = beginningBal + totalChar - totalCred;

        if (newBal > creditLimit) {
            std::cout<< "\nAccount: " << accNUM << std::endl;
            std::cout << "Credit Limit: " << creditLimit <<std::endl;
            std::cout << "Balance: " << newBal << std::endl;
            std::cout << "Credit Limit Exceeded. \n" << std::endl;
        }
    }
    std::cout << "Program ends. " <<std::endl;

    return 0;
}
```

```
■ D:\Act 3.1.exe

Enter Account Number: 100
Enter Beginning Balance: 5394.78
Enter Total Charges: 1000.00
Enter Total Credits: 500.00
Enter Credit Limit: 5500.00

Account: 100
Credit Limit: 5500.00
Balance: 5894.78
Credit Limit Exceeded.

Enter Account Number: 200
Enter Beginning Balance: 1000.00
Enter Total Charges: 123.45
Enter Total Credits: 321.00
Enter Credit Limit: 1500.00
Enter Account Number: 300
Enter Beginning Balance: 500.00
Enter Total Charges: 274.73
Enter Total Credits: 100.00
Enter Credit Limit: 800.00
Enter Account Number: -1
Program ends.

-------------------------------
Process exited after 100.2 seconds with return value 0
Press any key to continue . . .
```

2. Because of the price of gasoline, drivers are concerned with the mileage obtained by their automobiles. One driver has kept track of several tankfuels of gasoline by recording miles driven and gallons used for each tankful. Develop a program that will input the miles driven and gallons used for each tankful. The program should calculate and display the miles per gallon obtained for each tankful. After processing all input information, the program should calculate and print the combined miles per gallon obtained for all tank fuels.

Sample output:

Enter the gallons used (-1 to end): 12.8

Enter the miles driven: 287

The miles / gallon for this tank was 22.421875

Enter the gallons used (-1 to end): 10.3

Enter the miles driven: 200

The miles / gallon for this tank was 19.417475

Enter the gallons used (-1 to end): 5

Enter the miles driven: 120

The miles / gallon for this tank was 24.000000

Enter the gallons used (-1 to end):

The overall average miles/gallon was 21.601423

```cpp
#include <iostream>
#include <iomanip> //for std::fixed and std::setprecision

int main () {
    int gallonNUM = 0;
    double gallon, milesDriven;
    double totalGallons = 0.0;
    double totalMiles = 0.0;

    std::cout << std::fixed << std::setprecision(6); // Format to 6 decimal places

    while (true) {

        std::cout << "Enter the Gallons used: " ;
        std::cin >> gallon;
        if (gallon == -1) {
            break;
        }


        std::cout << "Enter Miles Driven: " ;
        std::cin >> milesDriven;


        double gallonNUM = milesDriven/gallon;
        std::cout << "The miles/gallon for this tank was " << gallonNUM << std::endl;

        totalGallons += gallon;
        totalMiles += milesDriven;
    }
        if (totalGallons > 0) {
            double overallgallonNUM = totalMiles / totalGallons;
            std::cout << "The overall average miles/gallon was " << overallgallonNUM << std::endl;
        }

        return 0;
}
```

```
D:\Act 3.1.exe

Enter the Gallons used: 12.8
Enter Miles Driven: 287
The miles/gallon for this tank was 22.421875
Enter the Gallons used: 10.3
Enter Miles Driven: 200
The miles/gallon for this tank was 19.417476
Enter the Gallons used: 5
Enter Miles Driven: 120
The miles/gallon for this tank was 24.000000
Enter the Gallons used: -1
The overall average miles/gallon was 21.601423

---------------------------------
Process exited after 25.73 seconds with return value 0
Press any key to continue . . .
```

3. Create a program that will calculate the cost of sending a small parcel. The post office charges
   P5.00 for the first 300g, and P2.00 for every 100g thereafter (rounded up), up to a maximum
   weight of 1000g.

```cpp
#include <iostream>
#include <iomanip>
#include <cmath> // for ceil()

int main () {
    int weight;
    double cost;

    std::cout << "Enter the weight of the parcel in grams: ";
    std::cin >> weight;

    if (weight <= 0 || weight > 1000) {
        std::cout << "Invalid weight. Please enter a value between 1 and 1000 grams. ";
        return 1;

    }

    cost = 5.00;

    if (weight >300) {
        int extraweight = weight - 300;
        int extraunits = static_cast<int>(ceil(extraweight / 100.0));
        cost += extraunits * 2.00;
    }
    std::cout << "Total shipping cost: " << std::fixed << std::setprecision(2) << cost << std::endl;
    return 0;
}
```

D:\Act 3.1.exe

```
nter the weight of the parcel in grams: 300g
otal shipping cost: 5.00

-------------------------------
rocess exited after 4.743 seconds with return value 0
ress any key to continue . . .
```

D:\Act 3.1.exe

```
Enter the weight of the parcel in grams: 100g
Total shipping cost: 5.00

-------------------------------
Process exited after 16.36 seconds with return value 0
Press any key to continue . . .
```

4. Write a program that displays a menu for simple conversion such as the following:

- (1) cm - inches
- (2) inches - cm
- (3) feet - meter
- (4) meter - feet

Once selected, user will be asked to enter a float and be converted. After the conversion the user would be ask to convert another until the user don't want anymore. Display your samples for all conversions

```cpp
1   #include <iostream>
2   #include <iomanip>
3
4   const float cm_to_inch = 0.393701;
5   const float inch_to_cm = 2.54;
6   const float feet_to_meter = 0.3048;
7   const float meter_to_feet = 3.28084;
8
9   int main() {
10      int choice;
11      float inputValue, result;
12      char again;
13
14      std::cout << std::fixed << std::setprecision(4);
15
16      do {
17          std::cout << "\nConversion Menu:\n";
18          std::cout << "(1) cm to inches\n";
19          std::cout << "(2) inches to cm\n";
20          std::cout << "(3) feet to meters\n";
21          std::cout << "(4) meters to feet\n";
22          std::cout << "Enter your choice (1-4): ";
23          std::cin >> choice;
24
25          switch (choice) {
26              case 1:
27                  std::cout << "Enter value in centimeters: ";
28                  std::cin >> inputValue;
29                  result = inputValue * cm_to_inch;
30                  std::cout << inputValue << " cm = " << result << " inches\n";
31                  break;
32
33              case 2:
34                  std::cout << "Enter value in inches: ";
35                  std::cin >> inputValue;
36                  result = inputValue * inch_to_cm;
37                  std::cout << inputValue << " inches = " << result << " cm\n";
38                  break;
39
```

```cpp
                        break;

            case 3:
                std::cout << "Enter value in feet: ";
                std::cin >> inputValue;
                result = inputValue * feet_to_meter;
                std::cout << inputValue << " feet = " << result << " meters\n";
                break;

            case 4:
                std::cout << "Enter value in meters: ";
                std::cin >> inputValue;
                result = inputValue * meter_to_feet;
                std::cout << inputValue << " meters = " << result << " feet\n";
                break;

            default:
                std::cout << "Invalid choice. Please select 1 to 4.\n";
                break;
        }

        std::cout << "\nDo you want to convert another? (Y/N): ";
        std::cin >> again;

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

    std::cout << "Thank you for using the converter!\n";

    return 0;
}
```

```
D:\Act 3.1.exe

Conversion Menu:
(1) cm to inches
(2) inches to cm
(3) feet to meters
(4) meters to feet
Enter your choice (1-4): 5
Invalid choice. Please select 1 to 4.

Do you want to convert another? (Y/N): Y

Conversion Menu:
(1) cm to inches
(2) inches to cm
(3) feet to meters
(4) meters to feet
Enter your choice (1-4): 2
Enter value in inches: 85
85.0000 inches = 215.9000 cm

Do you want to convert another? (Y/N): y

Conversion Menu:
(1) cm to inches
(2) inches to cm
(3) feet to meters
(4) meters to feet
Enter your choice (1-4): 3
Enter value in feet: 78
78.0000 feet = 23.7744 meters

Do you want to convert another? (Y/N): Y

Conversion Menu:
(1) cm to inches
(2) inches to cm
(3) feet to meters
(4) meters to feet
```

```
Do you want to convert another? (Y/N): Y

Conversion Menu:
(1) cm to inches
(2) inches to cm
(3) feet to meters
(4) meters to feet
Enter your choice (1-4): 4
Enter value in meters: 53
53.0000 meters = 173.8845 feet

Do you want to convert another? (Y/N): N
Thank you for using the converter!

---------------------------------
Process exited after 101.9 seconds with return value 0
Press any key to continue . . .
```

5. Write a program that displays a menu for simple computation of formula such as the following:

- (1) Area of circle, will ask for radius from user
- (2) Area of rectangle, will ask for L and W
- (3) Area of triangle, will ask for B and H
- (4) Area of square - feet, will ask for S

Once selected, user will be asked to enter a float and be computed as selected. After the computation, the user would be ask to compute another until the user don't want anymore. Display your samples for all conversions

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

using namespace std;

int main() {
    int choice;
    float radius, length, width, base, height, side, area;
    char again;

    cout << fixed << setprecision(2);

    do {

        cout << "\n--- Area Computation Menu ---\n";
        cout << "(1) Area of Circle\n";
        cout << "(2) Area of Rectangle\n";
        cout << "(3) Area of Triangle\n";
        cout << "(4) Area of Square (feet)\n";
        cout << "Enter your choice (1-4): ";
        cin >> choice;

        switch (choice) {
            case 1:
                cout << "Enter radius: ";
                cin >> radius;
                area = M_PI * radius * radius;
                cout << "Area of circle = " << area << " square units.\n";
                break;

            case 2:
                cout << "Enter length: ";
                cin >> length;
                cout << "Enter width: ";
                cin >> width;
                area = length * width;
                cout << "Area of rectangle = " << area << " square units.\n";
                break;
```

```cpp
            case 2:
                cout << "Enter length: ";
                cin >> length;
                cout << "Enter width: ";
                cin >> width;
                area = length * width;
                cout << "Area of rectangle = " << area << " square units.\n";
                break;

            case 3:
                cout << "Enter base: ";
                cin >> base;
                cout << "Enter height: ";
                cin >> height;
                area = 0.5 * base * height;
                cout << "Area of triangle = " << area << " square units.\n";
                break;

            case 4:
                cout << "Enter side length in feet: ";
                cin >> side;
                area = side * side;
                cout << "Area of square = " << area << " square feet.\n";
                break;

            default:
                cout << "Invalid choice. Please choose between 1 and 4.\n";
        }

        cout << "\nDo you want to compute another area? (Y/N): ";
        cin >> again;

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

    cout << "\nThank you for using the Area Calculator. Goodbye!\n";
    return 0;
}
```

```
--- Area Computation Menu ---
(1) Area of Circle
(2) Area of Rectangle
(3) Area of Triangle
(4) Area of Square (feet)
Enter your choice (1-4): 1
Enter radius: 6
Area of circle = 113.10 square units.

Do you want to compute another area? (Y/N): y

--- Area Computation Menu ---
(1) Area of Circle
(2) Area of Rectangle
(3) Area of Triangle
(4) Area of Square (feet)
Enter your choice (1-4): 4
Enter side length in feet: 69
Area of square = 4761.00 square feet.

Do you want to compute another area? (Y/N): n

Thank you for using the Area Calculator. Goodbye!

--------------------------------
Process exited after 15.89 seconds with return value 0
Press any key to continue . . . |
```

7. Supplementary Activity

8. Conclusion
It was hard to learn conditions, but with the help of some ai and google, I was about to understand coding this, coding if/else , while and repetitions. I was able to connect all my knowledge here. Some were similar to each other so it was easy when I understood it.

9. Assessment Rubric