Hands-on Activity No. <3.1>	
<Control Structures (part 2)>	
Course Code: CPE010	**Program:** Computer Engineering
Course Title: Data Structures and Algorithms	**Date Performed:** 8/17/25
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

PSEUDO CODE:

```
Start
 Input accountNumber
 While accountNumber is not -1
     Input beginningBalance
     Input totalCharges
     Input totalCredits
     Input creditLimit
     Set newBalance = beginningBalance + totalCharges - totalCredits
     If newBalance > creditLimit then
        Output "Account: ", accountNumber
        Output "Credit limit: ", creditLimit
        Output "Balance: ", newBalance
        Output "Credit Limit Exceeded."
   Else
        Output "Account: ", accountNumber
        Output "Credit limit: ", creditLimit
        Output "Balance: ", newBalance
        Output "Within credit limit."
   End if
   Input accountNumber
 End while
 Output "Program ends."
Stop
```

CODE:

Untitled1.cpp

```cpp
#include <iostream>
#include <iomanip>
using namespace std;

int main() {
    int accountNumber;
    float beginningBalance;
    float totalCharges;
    float totalCredits;
    float creditLimit;
    float newBalance;

    cout << fixed << setprecision(2);

    cout << "Enter account number (-1 to stop): ";
    cin >> accountNumber;

    while (accountNumber != -1) {
        cout << "Enter beginning balance: ";
        cin >> beginningBalance;

        cout << "Enter total charges: ";
        cin >> totalCharges;

        cout << "Enter total credits: ";
        cin >> totalCredits;

        cout << "Enter credit limit: ";
        cin >> creditLimit;

        newBalance = beginningBalance + totalCharges - totalCredits;

        if (newBalance > creditLimit) {
            cout << "Account: " << accountNumber << endl;
            cout << "Credit limit: " << creditLimit << endl;
            cout << "Balance: " << newBalance << endl;
            cout << "Credit Limit Exceeded.\n" << endl;
        }
        else {
            cout << "Account: " << accountNumber << endl;
            cout << "Credit limit: " << creditLimit << endl;
            cout << "Balance: " << newBalance << endl;
            cout << "Within credit limit.\n" << endl;
        }

        cout << "Enter account number (-1 to stop): ";
        cin >> accountNumber;
    }

    cout << "Program ends." << endl;

    return 0;
}
```

RESULT:

```
Select C:\Users\pc\Documents\Untitled1.exe
Credit limit: 5500.00
Balance: 5894.78
Credit Limit Exceeded.

Enter account number (-1 to stop): 200
Enter beginning balance: 1000
Enter total charges: 123.45
Enter total credits: 321
Enter credit limit: 1500
Account: 200
Credit limit: 1500.00
Balance: 802.45
Within credit limit.

Enter account number (-1 to stop): 300
Enter beginning balance: 500
Enter total charges: 247.73
Enter total credits: 100
Enter credit limit: 800
Account: 300
Credit limit: 800.00
Balance: 647.73
Within credit limit.

Enter account number (-1 to stop): -1
Program ends.

--------------------------------
Process exited after 233.3 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.

PSEUDO CODE:

Start
Set totalMiles = 0
Set totalGallons = 0
Output "Enter the gallons used (-1 to end): "
Input gallonsUsed
While gallonsUsed is not equal to -1
Output "Enter the miles driven: "
Input milesDriven
Set milesPerGallon = milesDriven / gallonsUsed
Output "The miles/gallon for this tank was ", milesPerGallon
totalMiles = totalMiles + milesDriven
totalGallons = totalGallons + gallonsUsed
Output "Enter the gallons used (-1 to end): "
Input gallonsUsed

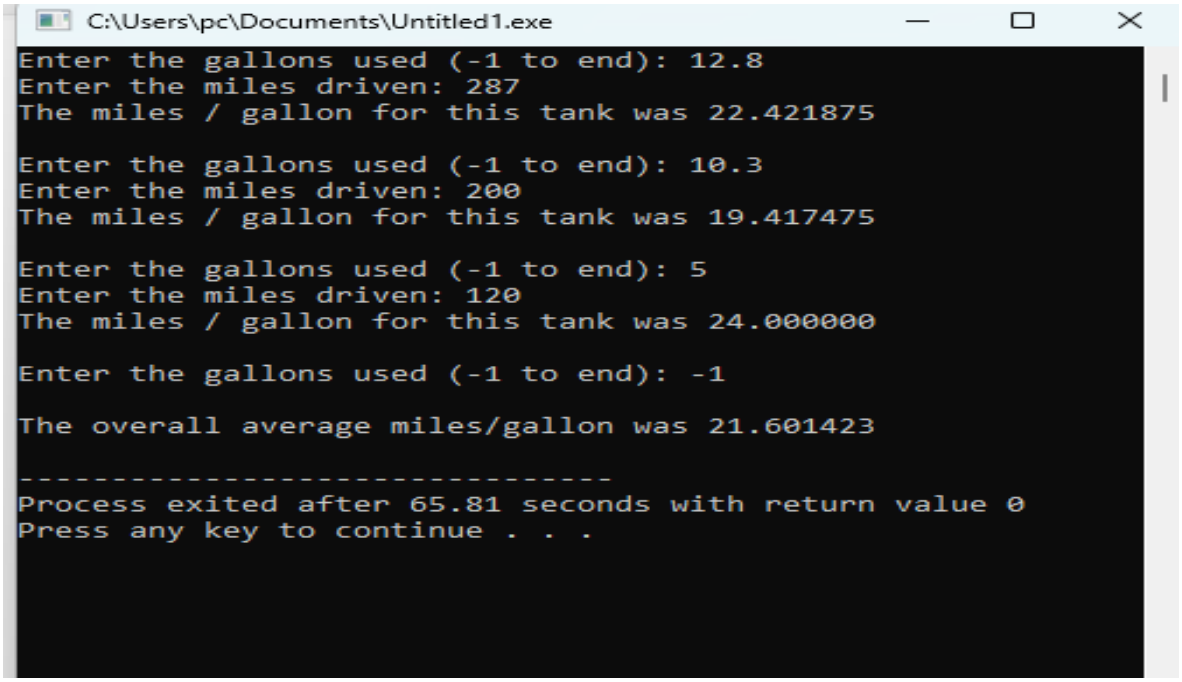
End while
If totalGallons > 0 then
Set overallAverage = totalMiles / totalGallons
Output "The overall average miles/gallon was ", overallAverage
End if

CODE:

ntitled1.cpp

```cpp
#include <iostream>
#include <iomanip>
using namespace std;

int main() {
    float gallonsUsed;
    float milesDriven;
    float milesPerGallon;
    float totalMiles = 0;
    float totalGallons = 0;

    cout << fixed << setprecision(6);

    cout << "Enter the gallons used (-1 to end): ";
    cin >> gallonsUsed;

    while (gallonsUsed != -1) {
        cout << "Enter the miles driven: ";
        cin >> milesDriven;

        milesPerGallon = milesDriven / gallonsUsed;
        cout << "The miles / gallon for this tank was " << milesPerGallon << endl;

        totalMiles += milesDriven;
        totalGallons += gallonsUsed;

        cout << "\nEnter the gallons used (-1 to end): ";
        cin >> gallonsUsed;
    }

    if (totalGallons > 0) {
        float overallAverage = totalMiles / totalGallons;
        cout << "\nThe overall average miles/gallon was " << overallAverage << endl;
    }

    return 0;
}
```

RESULT:



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.

PSEUDO CODE:

Start
Input weight
If weight > 1000 then
Output "Parcel exceeds maximum weight limit."
Else
If weight <= 100 then
cost ← 2.00
Else if weight <= 300 then
cost ← 5.00
Else
cost ← 5.00
extraWeight ← weight - 300
extraUnits ← extraWeight / 100
If extraWeight mod 100 ≠ 0 then
extraUnits ← extraUnits + 1
End if
cost ← cost + (extraUnits * 2.00)
End if
Output "The cost of sending the parcel is: P", cost
End if
Stop

CODE:

```cpp
#include <iostream>
#include <iomanip>
using namespace std;

int main() {
    int weight;
    float cost;

    cout << fixed << setprecision(2);

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

    if (weight > 1000) {
        cout << "Parcel exceeds maximum weight limit." << endl;
    } else {
        if (weight < 100) {
            cost = 2.00;
        }
        else if (weight < 300) {
            cost = 5.00;
        }
        else {
            cost = 5.00;
            int extraWeight = weight - 300;
            int extraUnits = extraWeight / 100;

            if (extraWeight % 100 != 0) {
                extraUnits += 1;
            }

            cost += extraUnits * 2.00;
        }

        cout << "The cost of sending the parcel is: P" << cost << endl;
    }

    return 0;
}

```

RESULT:

```
Enter weight of parcel in grams: 100
The cost of sending the parcel is: P2.00

--------------------------------
Process exited after 4.452 seconds with return value 0
Press any key to continue . . .
```

```
Enter weight of parcel in grams: 1000
The cost of sending the parcel is: P19.00

--------------------------------
Process exited after 4.035 seconds with return value 0
Press any key to continue . . .
```

```
Enter weight of parcel in grams: 300
The cost of sending the parcel is: P5.00

--------------------------------
Process exited after 6.246 seconds with ret
Press any key to continue . . .
```

```
Enter weight of parcel in grams: 10000
Parcel exceeds maximum weight limit.

--------------------------------
Process exited after 3.726 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:

- cm - inches
- inches - cm
- feet - meter
- meter - feet

PSEUDO CODE:

```
start
 do
 output "(1) cm -> inches"
 output "(2) inches -> cm"
 output "(3) feet -> meter"
 output "(4) meter -> feet"
 output "Enter your choice (1-4): "
 input choice
 if choice == 1 then
 output "Enter value in cm: "
 input value
 result = value / 2.54
 output value, " cm = ", result, " inches"
 else if choice == 2 then
 output "Enter value in inches: "
 input value
 result = value * 2.54
 output value, " inches = ", result, " cm"
 else if choice == 3 then
 output "Enter value in feet: "
 input value
 result = value * 0.3048
 output value, " feet = ", result, " meters"
 else if choice == 4 then
 output "Enter value in meters: "
 input value
 result = value / 0.3048
 output value, " meters = ", result, " feet"
 else
 output "Invalid choice. Please select 1-4."
 end if
 output "Do you want to convert again? (yes/no): "
 input again
 while again == "yes" or again == "Yes"
 output "End"
stop
```

CODE:

Untitled1.cpp

```
using namespace std;

int main() {
    int choice;
    float value, result;
    string again;

    do {
        cout << "(1) cm -> inches\n";
        cout << "(2) inches -> cm\n";
        cout << "(3) feet -> meters\n";
        cout << "(4) meter -> feet\n";
        cout << "Enter your choice (1-4): ";
        cin >> choice;

        if (choice == 1) {
            cout << "Enter value in cm: ";
            cin >> value;
            result = value / 2.54;
            cout << value << " cm = " << result << " inches\n";
        }
        else if (choice == 2) {
            cout << "Enter value in inches: ";
            cin >> value;
            result = value * 2.54;
            cout << value << " inches = " << result << " cm\n";
        }
        else if (choice == 3) {
            cout << "Enter value in feet: ";
            cin >> value;
            result = value * 0.3048;
            cout << value << " feet = " << result << " meters\n";
        }
        else if (choice == 4) {
            cout << "Enter value in meters: ";
            cin >> value;
            result = value / 0.3048;
            cout << value << " meters = " << result << " feet\n";
        }
        else {
            cout << "Invalid choice. Please select 1-4.\n";
        }

        cout << "Do you want to convert again? (yes/no): ";
        cin >> again;

    } while (again == "yes" || again == "Yes");

    cout << "End";
    return 0;
}
```

RESULT:

```
(1) cm -> inches
(2) inches -> cm
(3) feet -> meters
(4) meter -> feet
Enter your choice (1-4): 1
Enter value in cm: 15
15 cm = 5.90551 inches
Do you want to convert again? (yes/no): yes
(1) cm -> inches
(2) inches -> cm
(3) feet -> meters
(4) meter -> feet
Enter your choice (1-4): 2
Enter value in inches: 20
20 inches = 50.8 cm
Do you want to convert again? (yes/no): yes
(1) cm -> inches
(2) inches -> cm
(3) feet -> meters
(4) meter -> feet
Enter your choice (1-4): 3
Enter value in feet: 10
10 feet = 3.048 meters
Do you want to convert again? (yes/no): yes
(1) cm -> inches
(2) inches -> cm
(3) feet -> meters
(4) meter -> feet
Enter your choice (1-4): 4
Enter value in meters: 13
13 meters = 42.6509 feet
Do you want to convert again? (yes/no): no
End
--------------------------------
Process exited after 237.3 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:

- Area of circle, will ask for radius from user
- Area of rectangle, will ask for L and W
- Area of triangle, will ask for B and H
- Area of square - feet, will ask for S

PSEUDO CODE:

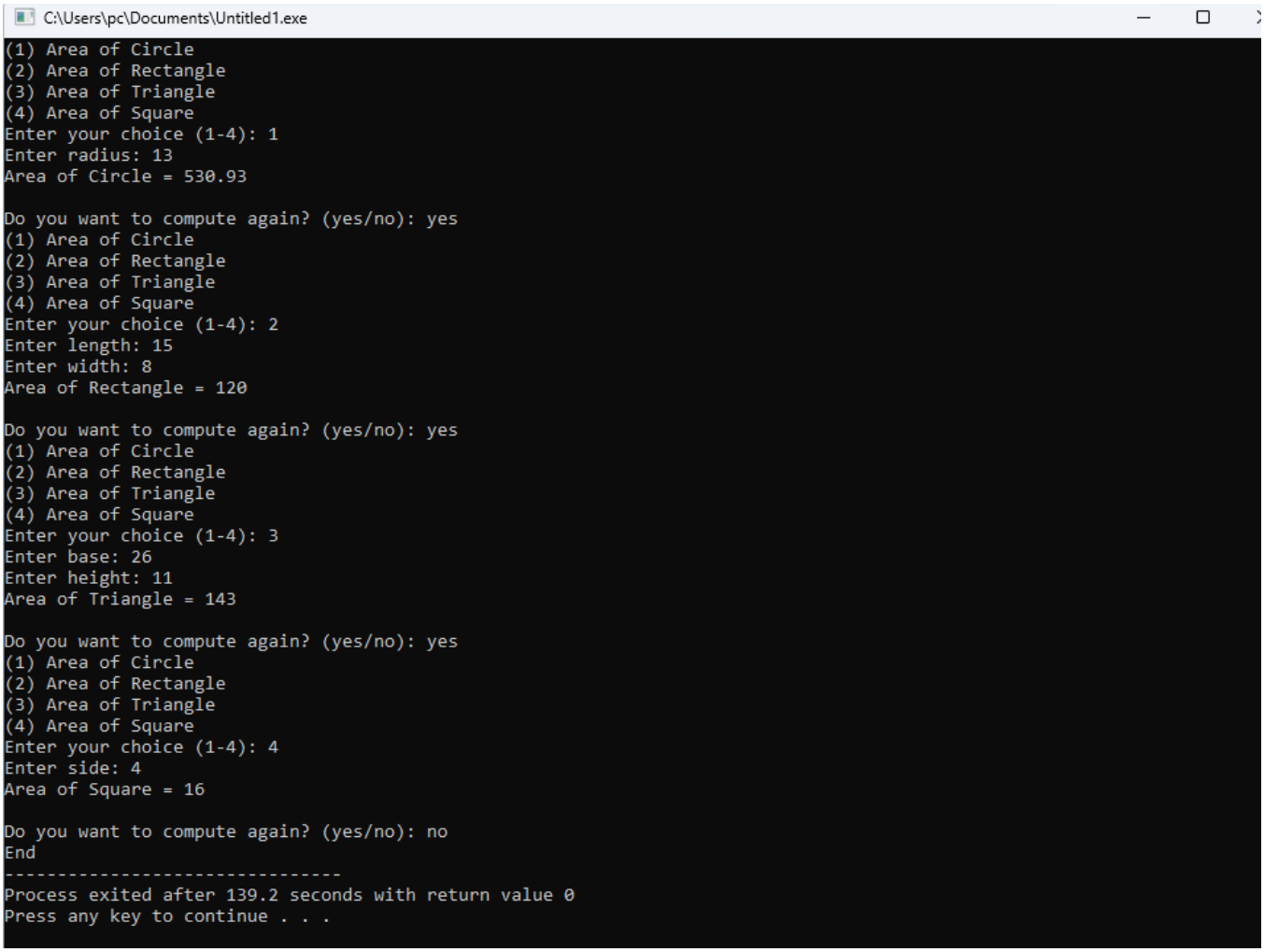
```
Start
 Repeat
 Output "(1) Area of Circle"
 Output "(2) Area of Rectangle"
 Output "(3) Area of Triangle"
 Output "(4) Area of Square"
 Output "Enter your choice (1-4): "
 Input choice
 If choice = 1 then
 Output "Enter radius: "
 Input radius
 area = 3.1416 * radius * radius
 Output "Area of Circle = ", area
 Else if choice = 2 then
 Output "Enter length: "
 Input length
 Output "Enter width: "
 Input width
 area = length * width
 Output "Area of Rectangle = ", area
 Else if choice = 3 then
 Output "Enter base: "
 Input base
 Output "Enter height: "
 Input height
 area = 0.5 * base * height
 Output "Area of Triangle = ", area
 Else if choice = 4 then
 Output "Enter side: "
 Input side
 area = side * side
 Output "Area of Square = ", area
 Else
 Output "Invalid choice. Please select 1-4."
 End if
 Output "Do you want to compute again? (yes/no): "
 Input again
 Until again ≠ "yes" and again ≠ "Yes"
 Output "End"
Stop
```

CODE:

Untitled1.cpp

```cpp

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

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

        if (choice == 1) {
            cout << "Enter radius: ";
            cin >> radius;
            area = 3.1416 * radius * radius;
            cout << "Area of Circle = " << area << endl;
        }
        else if (choice == 2) {
            cout << "Enter length: ";
            cin >> length;
            cout << "Enter width: ";
            cin >> width;
            area = length * width;
            cout << "Area of Rectangle = " << area << endl;
        }
        else if (choice == 3) {
            cout << "Enter base: ";
            cin >> base;
            cout << "Enter height: ";
            cin >> height;
            area = 0.5 * base * height;
            cout << "Area of Triangle = " << area << endl;
        }
        else if (choice == 4) {
            cout << "Enter side: ";
            cin >> side;
            area = side * side;
            cout << "Area of Square = " << area << endl;
        }
        else {
            cout << "Invalid choice. Please select 1-4.\n";
        }

        cout << "\nDo you want to compute again? (yes/no): ";
        cin >> again;

    } while (again == "yes" || again == "Yes");

    cout << "End";
    return 0;
}
```

RESULTS:



7. Supplementary Activity

8. Conclusion

In this activity, I learned how to create different kinds of c++ programs and also make their paseudo codes, it was hard and I also struggled in making pseudo code but I eventually got how it works.i also learned to calculate different shapes and units, and I have become more familiar with using different variables, and other conditional statements.

9. Assessment Rubric

Rubric for SO 7 (8)

Criteria	Ratings						Pts
SO 7 PI 1 IILO4 Utilize lifelong learning skills in pursuit of personal development and excellence in professional practice. threshold: 4.8 pts	6 pts Excellent | Educational interests and pursuits exist and flourish outside classroom requirements,knowledge and/or experiences are pursued independently and applies knowledge learned into practice	5 pts Good | Educational interests and pursuits exist and flourish outside classroom requirements,knowledge and/or experiences are pursued independently	4 pts Satisfactory | Look beyond classroom requirements, showing interest in pursuing knowledge independently	3 pts Unsatisfactory | Begins to look beyond classroom requirements, showing interest in pursuing knowledge independently	2 pts Poor | Relies on classroom instruction only	1 pts Very Poor | No initiative or interest in acquiring new knowledge	6 pts
SO 7 PI 2 IILO4 Utilize lifelong learning skills in pursuit of personal development and excellence in professional practice. threshold: 4.8 pts	6 pts Excellent | Completes an assigned task independently and practices continuous improvement	5 pts Good | Completes an assigned task without supervision or guidance	4 pts Satisfactory | Requires minimal guidance to complete an assigned task	3 pts Unsatisfactory | Requires detailed or step-by-step instructions to complete a task	2 pts Poor | Shows little interest to complete a task independently	1 pts Very Poor | No interest to complete a task independently	6 pts
SO 7 PI 3 IILO4 Utilize lifelong learning skills in pursuit of personal development and excellence in professional practice. threshold: 4.8 pts	6 pts Excellent | Synthesizes and integrates information from a variety of sources; formulates a clear and precise perspective; draws appropriate conclusions	5 pts Good | Evaluate information from a variety of sources; formulates a clear and precise perspective.	4 pts Satisfactory | Analyze information from a variety of sources; formulates a clear and precise perspective.	3 pts Unsatisfactory | Apply the gathered information to formulate the problem	2 pts Poor | Gather and summarized the information from a variety of sources but failed to formulate the problem	1 pts Very Poor | Gather information from a variety of sources	6 pts
SO 7 PI 4 IILO4 Utilize lifelong learning skills in pursuit of personal development and excellence in professional practice. threshold: 4.8 pts	6 pts Excellent | Ideas are combined in original and creative ways in line with the new and emerging technology trends to solve a problem or address an issue.	5 pts Good | Ideas are creative and adapt the new knowledge to solve a problem or address an issue	4 pts Satisfactory | Ideas are creative in solving a problem, or address an issue	3 pts Unsatisfactory | Shows some creative ways to solve the problem	2 pts Poor | Shows initiative and attempt to develop creative ideas to solve the problem	1 pts Very Poor | Ideas are copied or restated from the sources consulted	6 pts

Total Points: 24