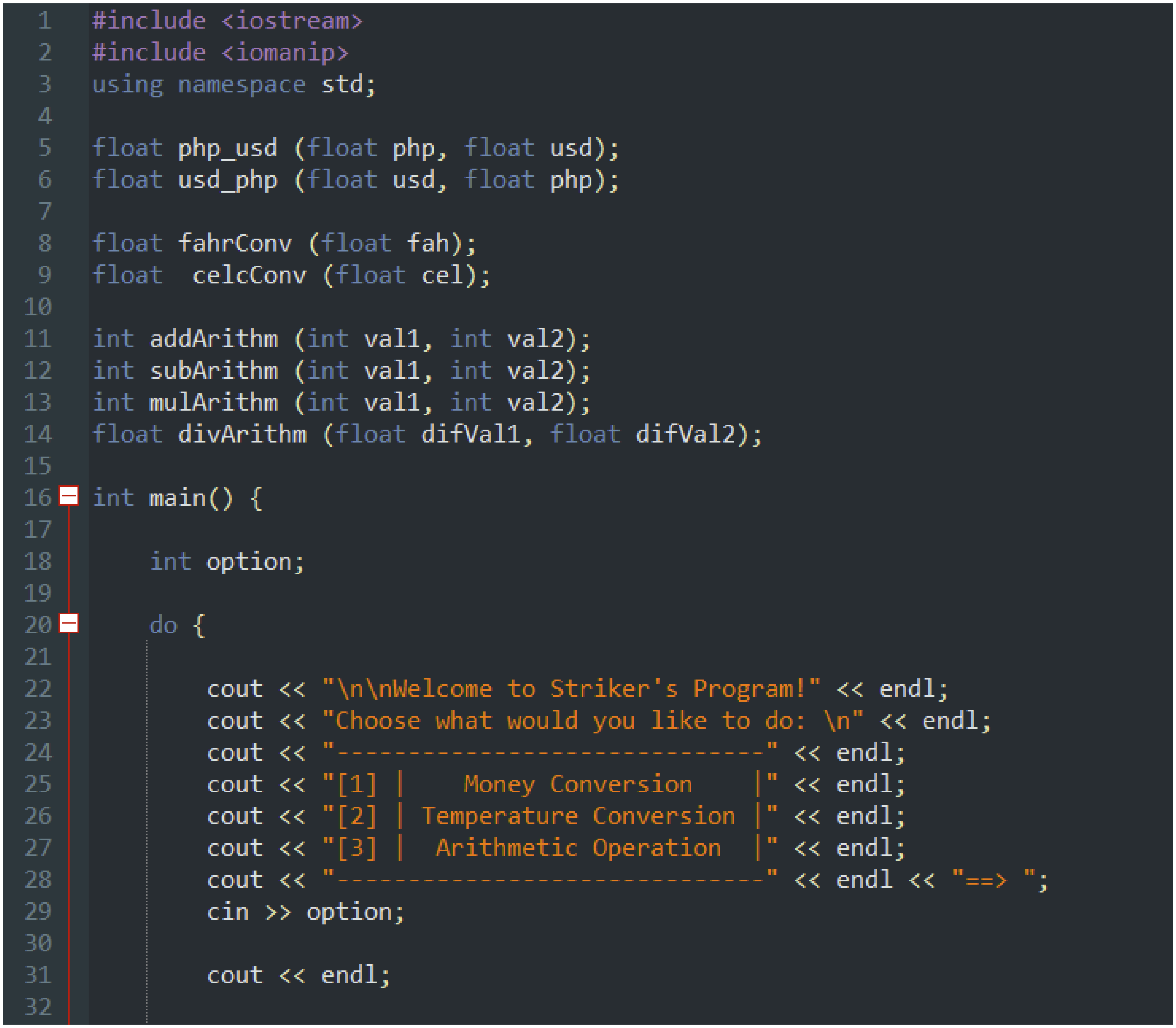
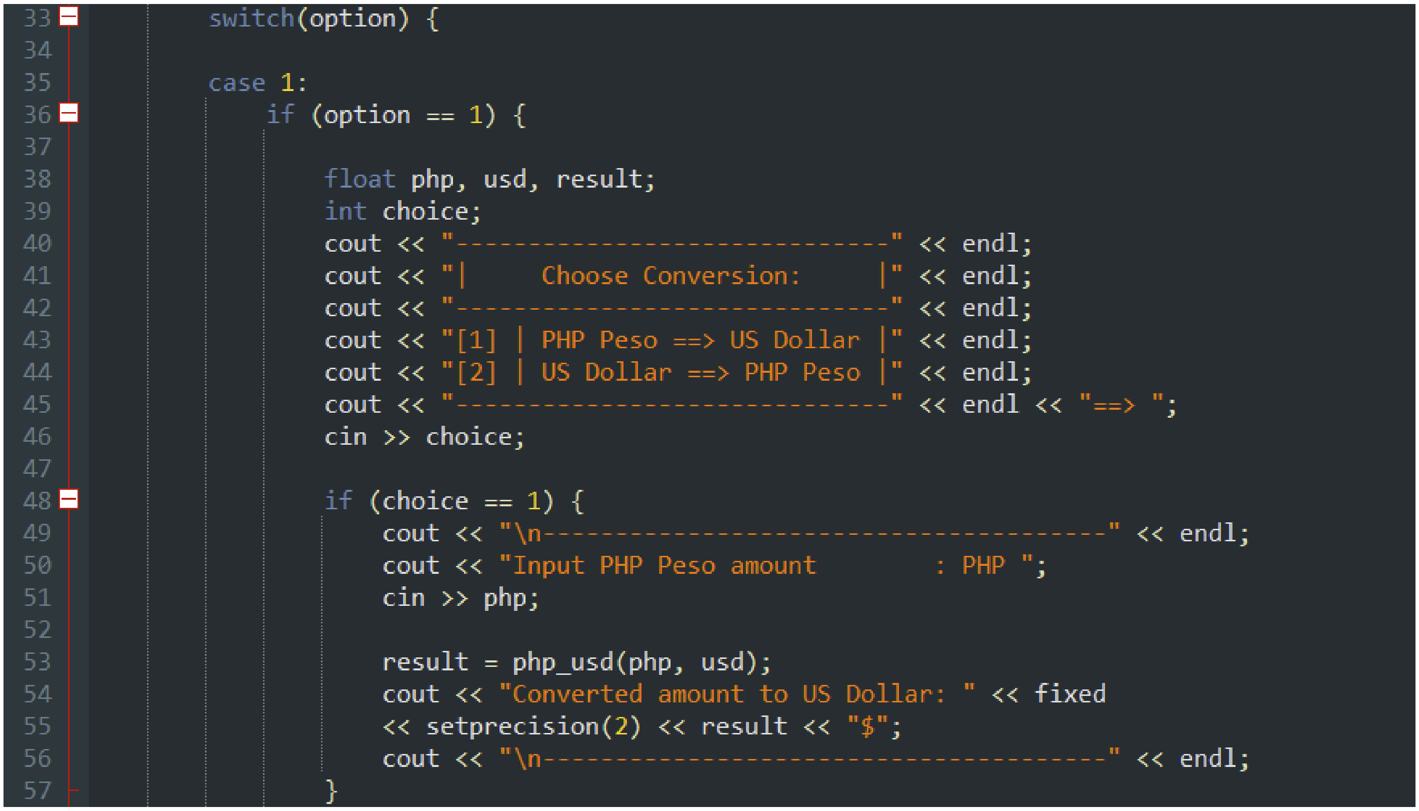
Hands-on Activity 6.1	
Functions	
Course Code: CPE007	**Program:** Computer Engineering
Course Title: Programming Logic and Design	**Date Performed: 20/10/25**
Section: CPE11S1	**Date Submitted: 22/10/25**
Name(s): James Daniel M. Verano	**Instructor: Engr. Jimlord M. Quejado**
6. Output	

Code:

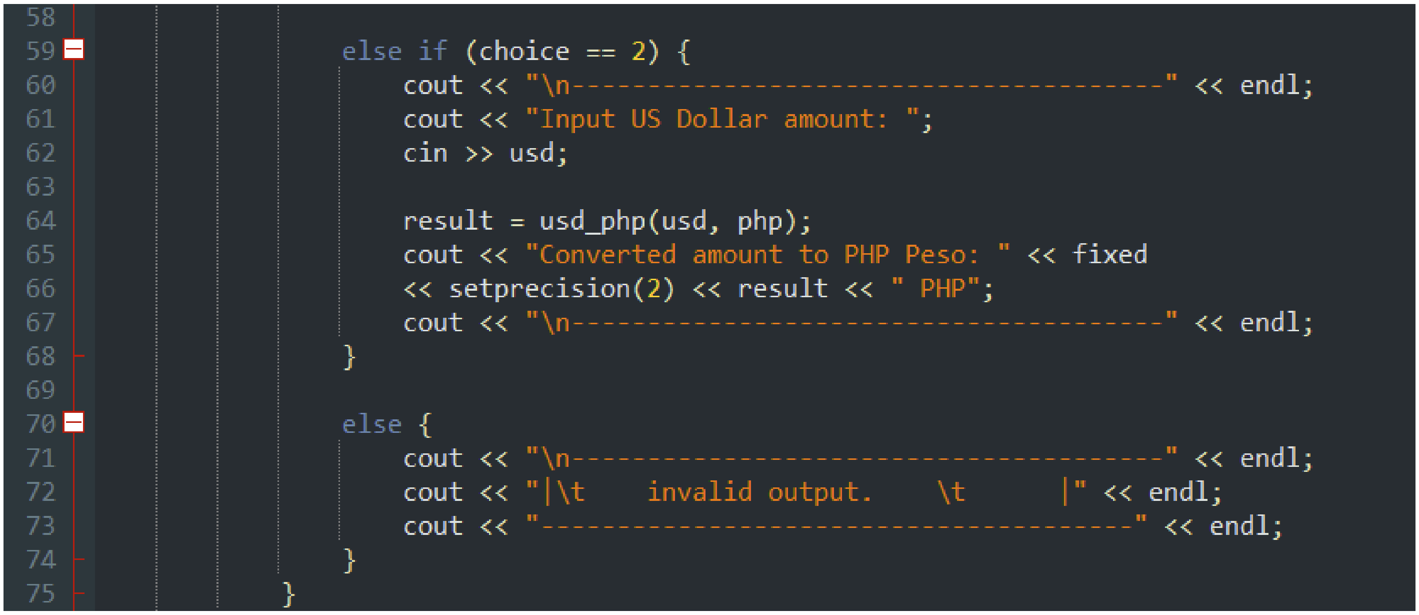


```cpp
#include <iostream>
#include <iomanip>
using namespace std;

float php_usd (float php, float usd);
float usd_php (float usd, float php);

float fahrConv (float fah);
float  celcConv (float cel);

int addArithm (int val1, int val2);
int subArithm (int val1, int val2);
int mulArithm (int val1, int val2);
float divArithm (float difVal1, float difVal2);

int main() {

    int option;

    do {

        cout << "\n\nWelcome to Striker's Program!" << endl;
        cout << "Choose what would you like to do: \n" << endl;
        cout << "------------------------------" << endl;
        cout << "[1] |    Money Conversion    |" << endl;
        cout << "[2] | Temperature Conversion |" << endl;
        cout << "[3] |  Arithmetic Operation  |" << endl;
        cout << "------------------------------" << endl << "==> ";
        cin >> option;

        cout << endl;

```

[Case 1 Code Function: Money Conversion PHP to USD Vice Versa]

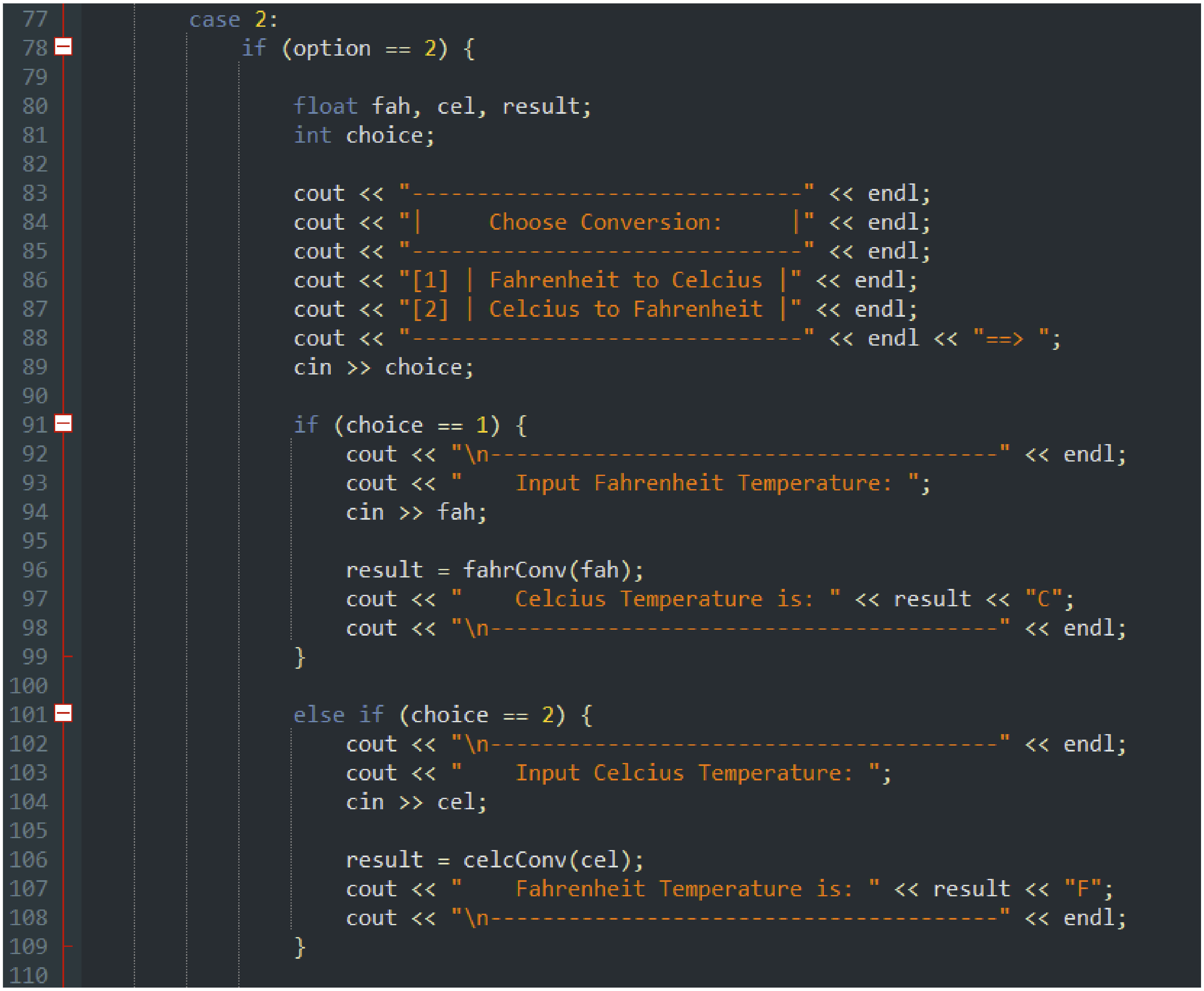


```cpp
        switch(option) {

        case 1:
            if (option == 1) {

                float php, usd, result;
                int choice;
                cout << "------------------------------" << endl;
                cout << "|     Choose Conversion:     |" << endl;
                cout << "------------------------------" << endl;
                cout << "[1] | PHP Peso ==> US Dollar |" << endl;
                cout << "[2] | US Dollar ==> PHP Peso |" << endl;
                cout << "------------------------------" << endl << "==> ";
                cin >> choice;

                if (choice == 1) {
                    cout << "\n---------------------------------------" << endl;
                    cout << "Input PHP Peso amount        : PHP ";
                    cin >> php;

                    result = php_usd(php, usd);
                    cout << "Converted amount to US Dollar: " << fixed
                    << setprecision(2) << result << "$";
                    cout << "\n---------------------------------------" << endl;
                }
```

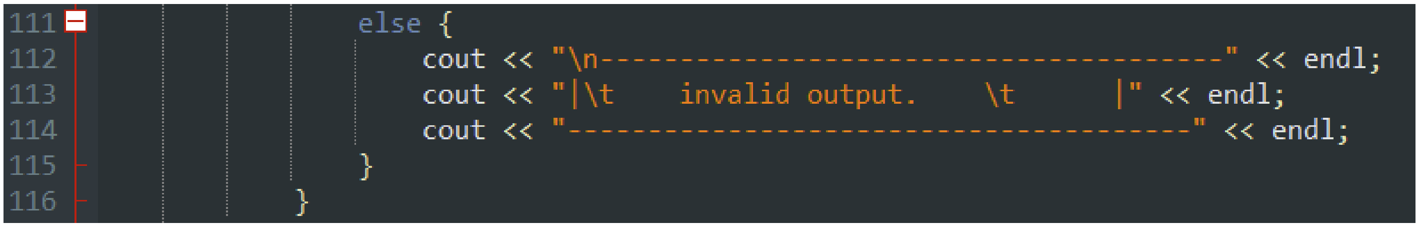


```cpp

                else if (choice == 2) {
                    cout << "\n---------------------------------------" << endl;
                    cout << "Input US Dollar amount: ";
                    cin >> usd;

                    result = usd_php(usd, php);
                    cout << "Converted amount to PHP Peso: " << fixed
                    << setprecision(2) << result << " PHP";
                    cout << "\n---------------------------------------" << endl;
                }

                else {
                    cout << "\n---------------------------------------" << endl;
                    cout << "|\t    invalid output.    \t      |" << endl;
                    cout << "---------------------------------------" << endl;
                }
            }
```

[Case 2 Code Function: Conversion of Temperature]:

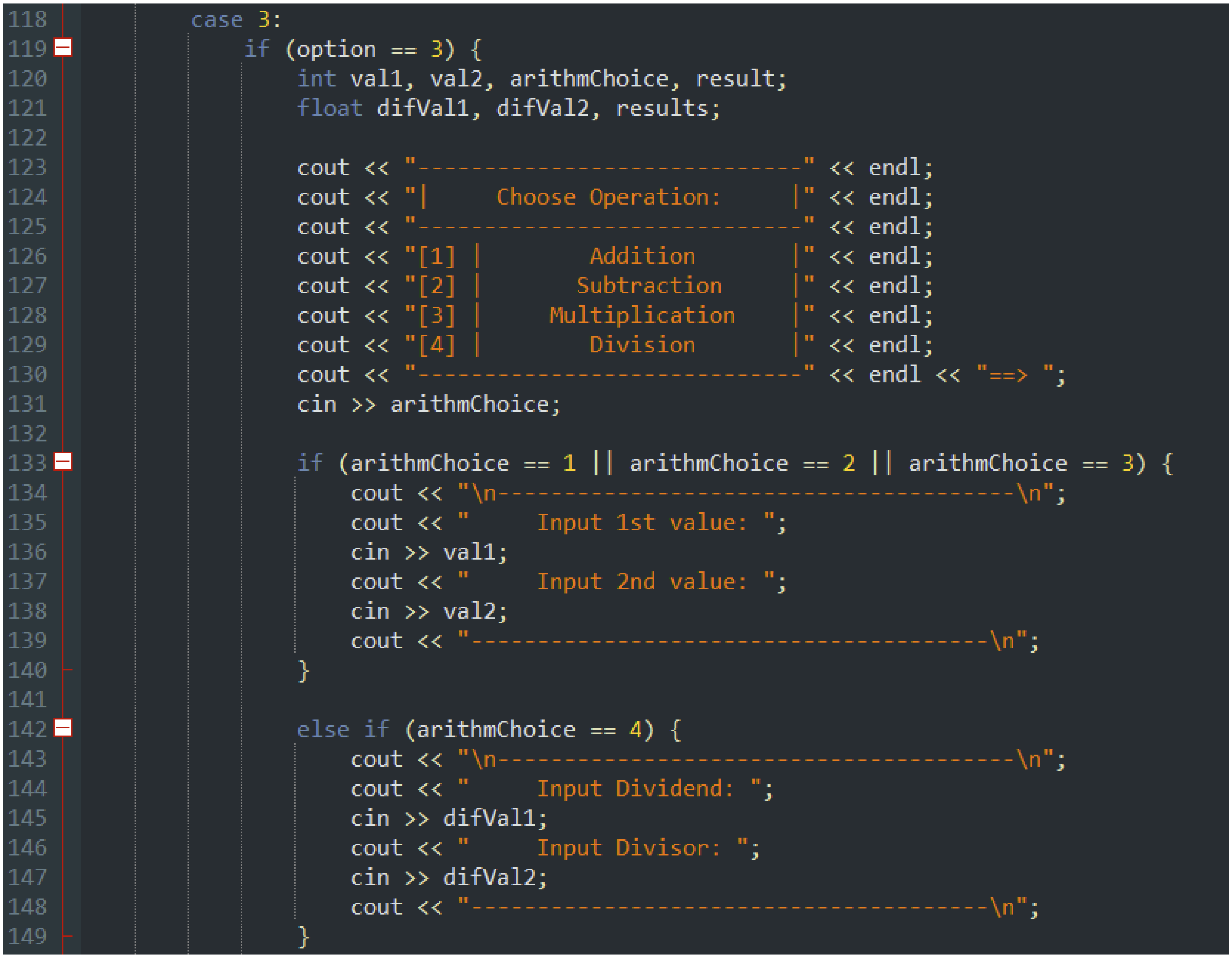


```cpp
        case 2:
            if (option == 2) {

                float fah, cel, result;
                int choice;

                cout << "------------------------------" << endl;
                cout << "|     Choose Conversion:     |" << endl;
                cout << "------------------------------" << endl;
                cout << "[1] | Fahrenheit to Celcius |" << endl;
                cout << "[2] | Celcius to Fahrenheit |" << endl;
                cout << "------------------------------" << endl << "==> ";
                cin >> choice;

                if (choice == 1) {
                    cout << "\n---------------------------------------" << endl;
                    cout << "    Input Fahrenheit Temperature: ";
                    cin >> fah;

                    result = fahrConv(fah);
                    cout << "    Celcius Temperature is: " << result << "C";
                    cout << "\n---------------------------------------" << endl;
                }

                else if (choice == 2) {
                    cout << "\n---------------------------------------" << endl;
                    cout << "    Input Celcius Temperature: ";
                    cin >> cel;

                    result = celcConv(cel);
                    cout << "    Fahrenheit Temperature is: " << result << "F";
                    cout << "\n---------------------------------------" << endl;
                }

```

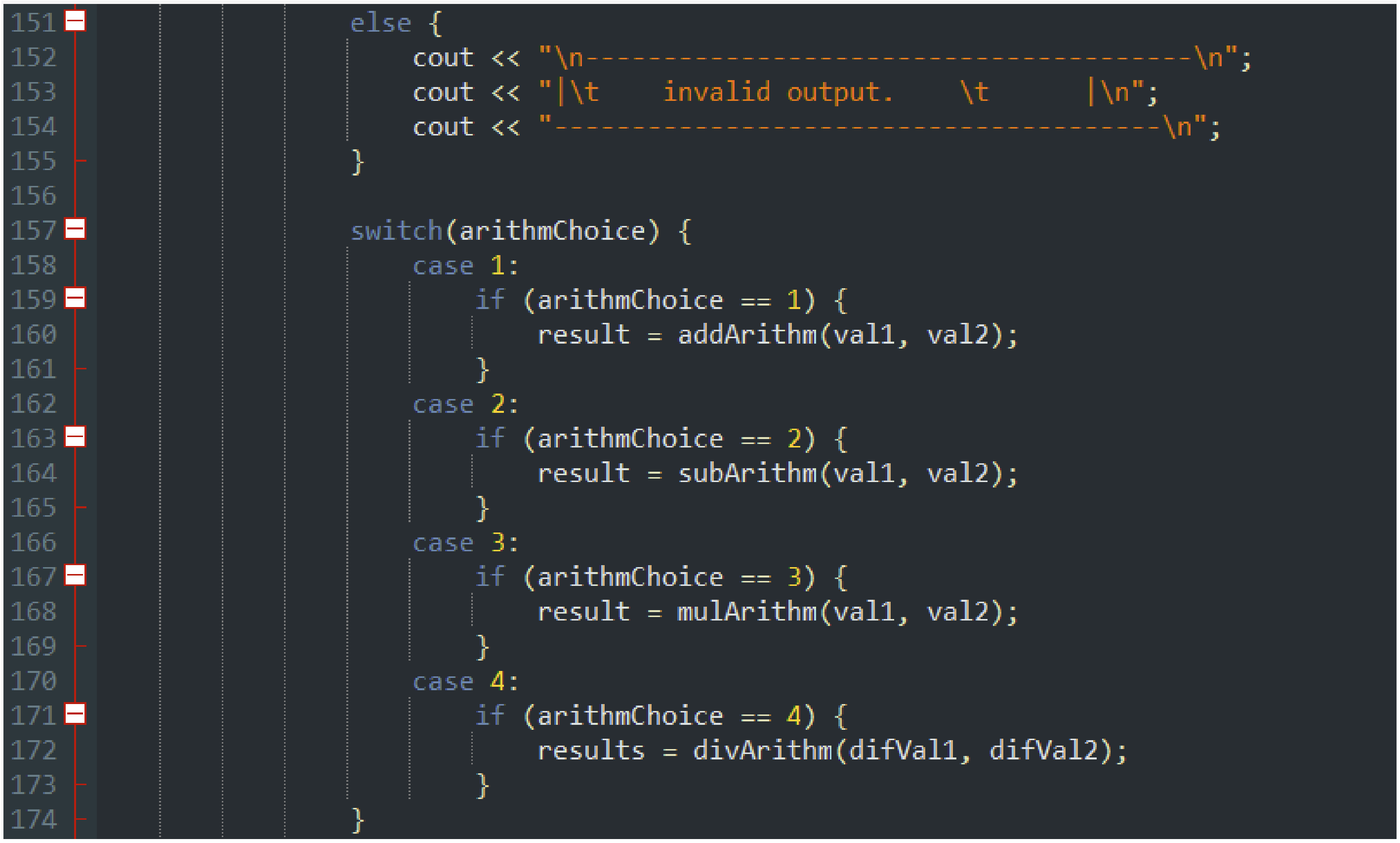


```cpp
                else {
                    cout << "\n---------------------------------------" << endl;
                    cout << "|\t    invalid output.    \t      |" << endl;
                    cout << "----------------------------------------" << endl;
                }
            }
```

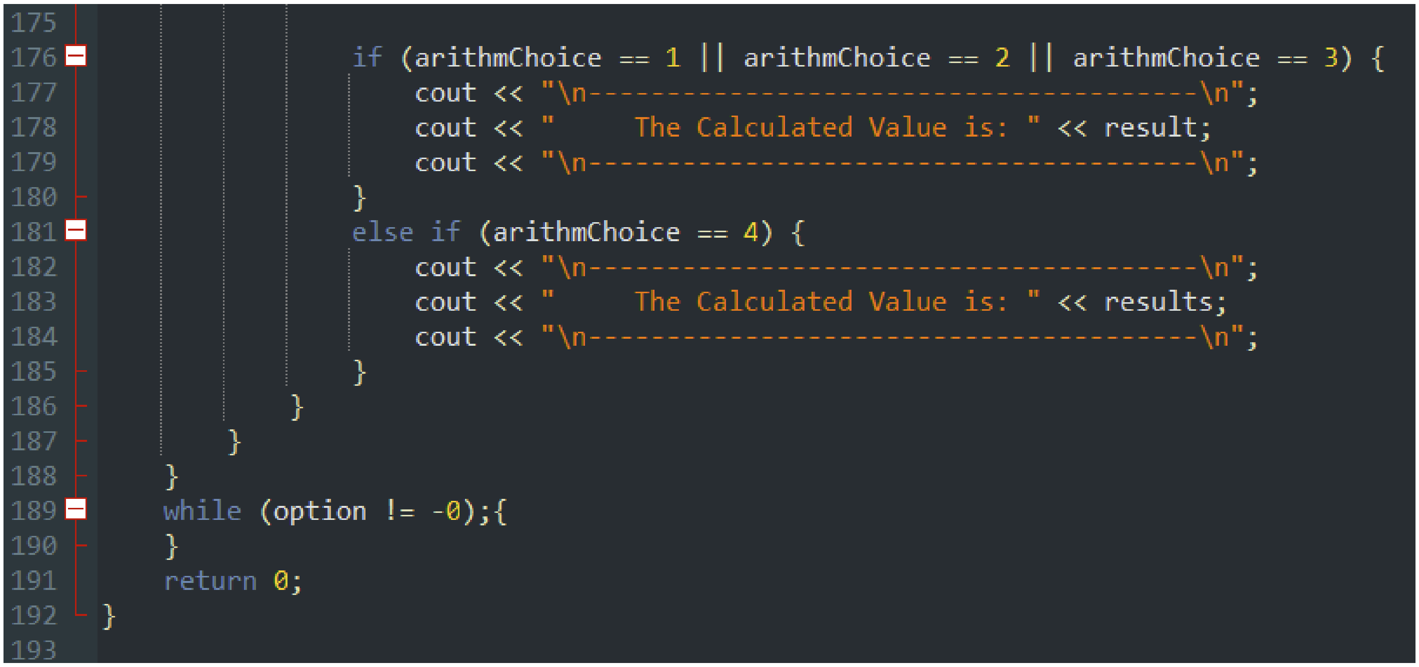
[Case 3 Code Function: Arithmetic Operation in a 2 user input]:



```cpp
        case 3:
            if (option == 3) {
                int val1, val2, arithmChoice, result;
                float difVal1, difVal2, results;

                cout << "-----------------------------" << endl;
                cout << "|     Choose Operation:     |" << endl;
                cout << "-----------------------------" << endl;
                cout << "[1] |        Addition       |" << endl;
                cout << "[2] |       Subtraction     |" << endl;
                cout << "[3] |     Multiplication    |" << endl;
                cout << "[4] |        Division       |" << endl;
                cout << "-----------------------------" << endl << "==> ";
                cin >> arithmChoice;

                if (arithmChoice == 1 || arithmChoice == 2 || arithmChoice == 3) {
                    cout << "\n---------------------------------------\n";
                    cout << "     Input 1st value: ";
                    cin >> val1;
                    cout << "     Input 2nd value: ";
                    cin >> val2;
                    cout << "---------------------------------------\n";
                }

                else if (arithmChoice == 4) {
                    cout << "\n---------------------------------------\n";
                    cout << "     Input Dividend: ";
                    cin >> difVal1;
                    cout << "     Input Divisor: ";
                    cin >> difVal2;
                    cout << "---------------------------------------\n";
                }
```

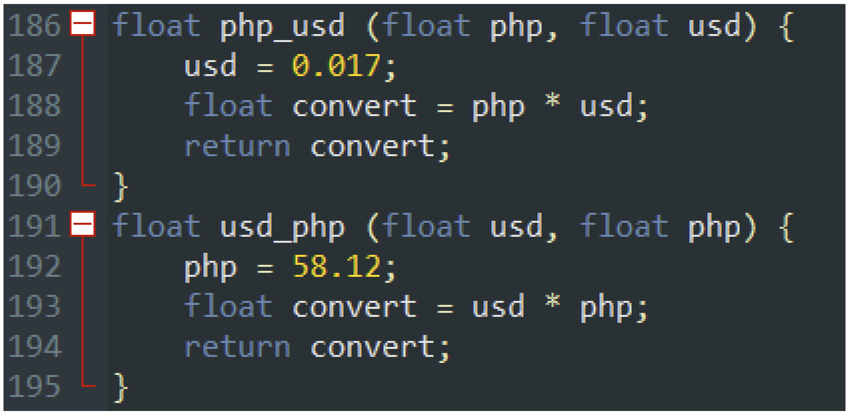


```
                else {
                    cout << "\n---------------------------------------\n";
                    cout << "|\t    invalid output.    \t       |\n";
                    cout << "---------------------------------------\n";
                }

                switch(arithmChoice) {
                    case 1:
                        if (arithmChoice == 1) {
                            result = addArithm(val1, val2);
                        }
                    case 2:
                        if (arithmChoice == 2) {
                            result = subArithm(val1, val2);
                        }
                    case 3:
                        if (arithmChoice == 3) {
                            result = mulArithm(val1, val2);
                        }
                    case 4:
                        if (arithmChoice == 4) {
                            results = divArithm(difVal1, difVal2);
                        }
                }
```



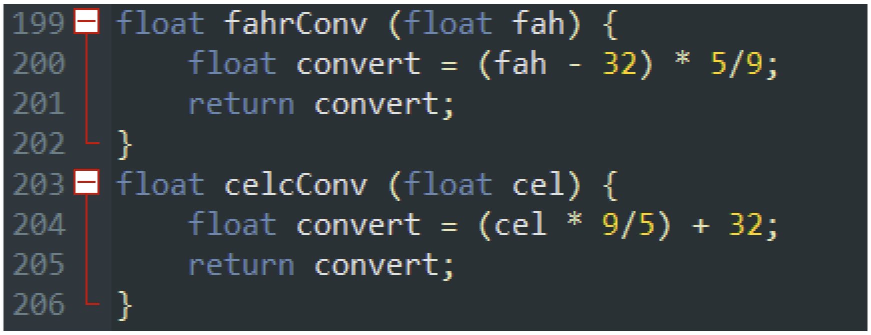
```

                if (arithmChoice == 1 || arithmChoice == 2 || arithmChoice == 3) {
                    cout << "\n---------------------------------------\n";
                    cout << "     The Calculated Value is: " << result;
                    cout << "\n---------------------------------------\n";
                }
                else if (arithmChoice == 4) {
                    cout << "\n---------------------------------------\n";
                    cout << "     The Calculated Value is: " << results;
                    cout << "\n---------------------------------------\n";
                }
            }
        }
    }
    while (option != -0);{
    }
    return 0;
}

```

[Function Declaration Prototype:]:



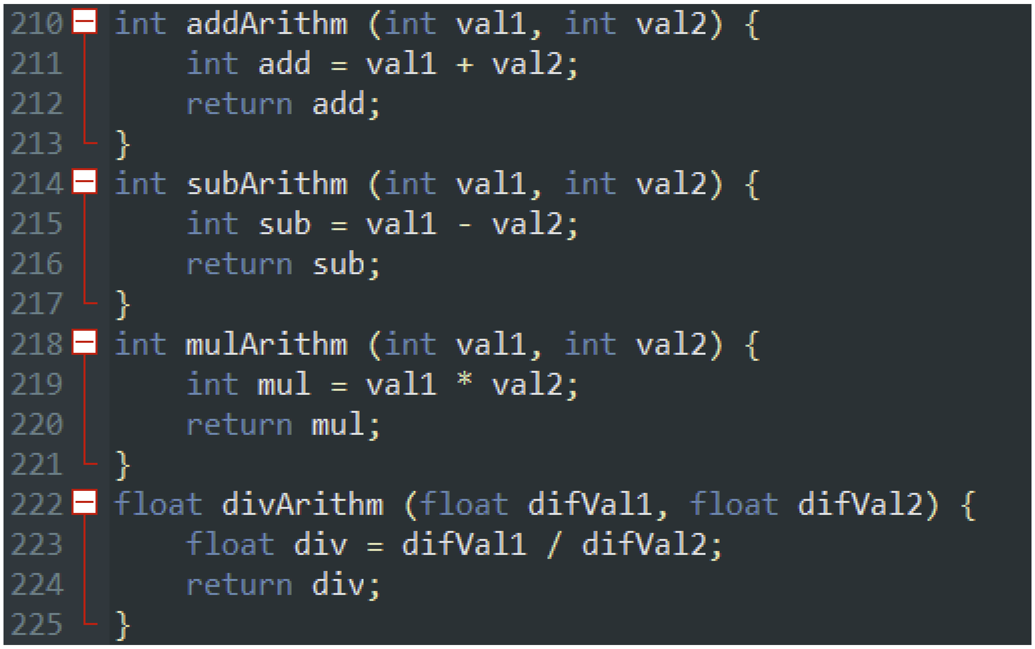
```
float php_usd (float php, float usd) {
    usd = 0.017;
    float convert = php * usd;
    return convert;
}
float usd_php (float usd, float php) {
    php = 58.12;
    float convert = usd * php;
    return convert;
}
```

For Money Conversion



```
float fahrConv (float fah) {
    float convert = (fah - 32) * 5/9;
    return convert;
}
float celcConv (float cel) {
    float convert = (cel * 9/5) + 32;
    return convert;
}
```

For Temperature Conversion

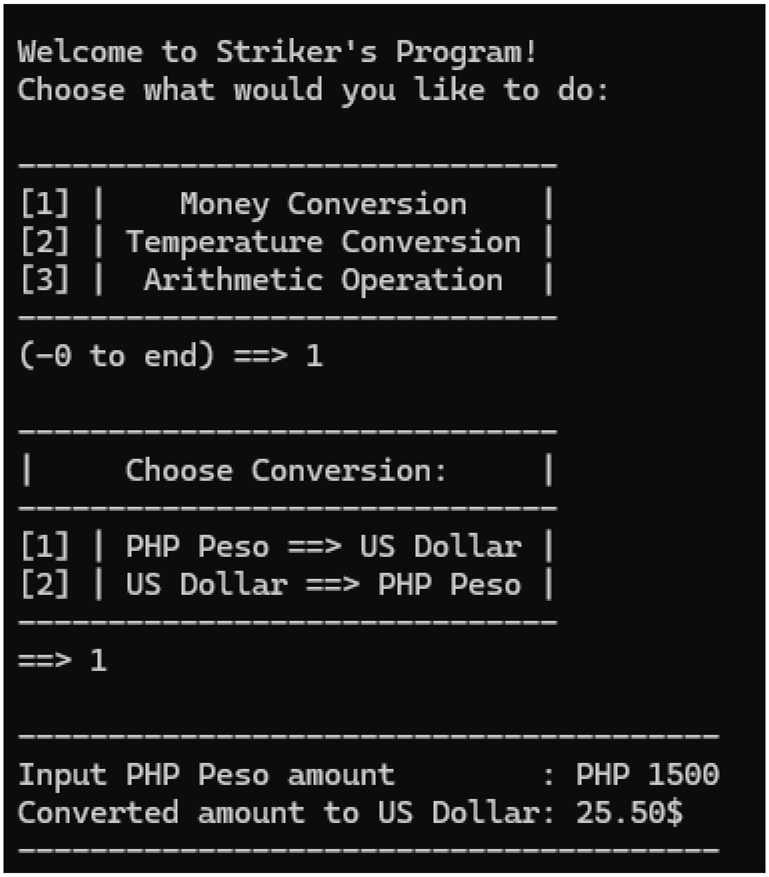


```
int addArithm (int val1, int val2) {
    int add = val1 + val2;
    return add;
}
int subArithm (int val1, int val2) {
    int sub = val1 - val2;
    return sub;
}
int mulArithm (int val1, int val2) {
    int mul = val1 * val2;
    return mul;
}
float divArithm (float difVal1, float difVal2) {
    float div = difVal1 / difVal2;
    return div;
}
```

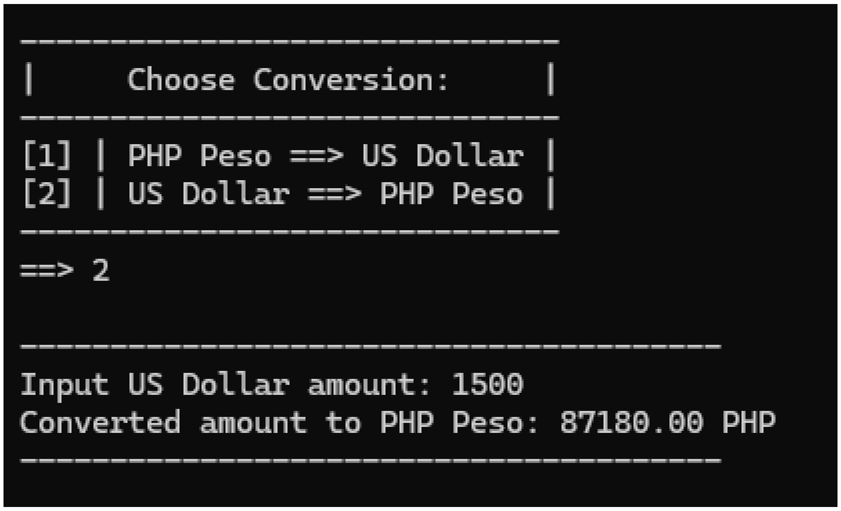
For Arithmetic Operations

Outputs:

[Conversion of Money]

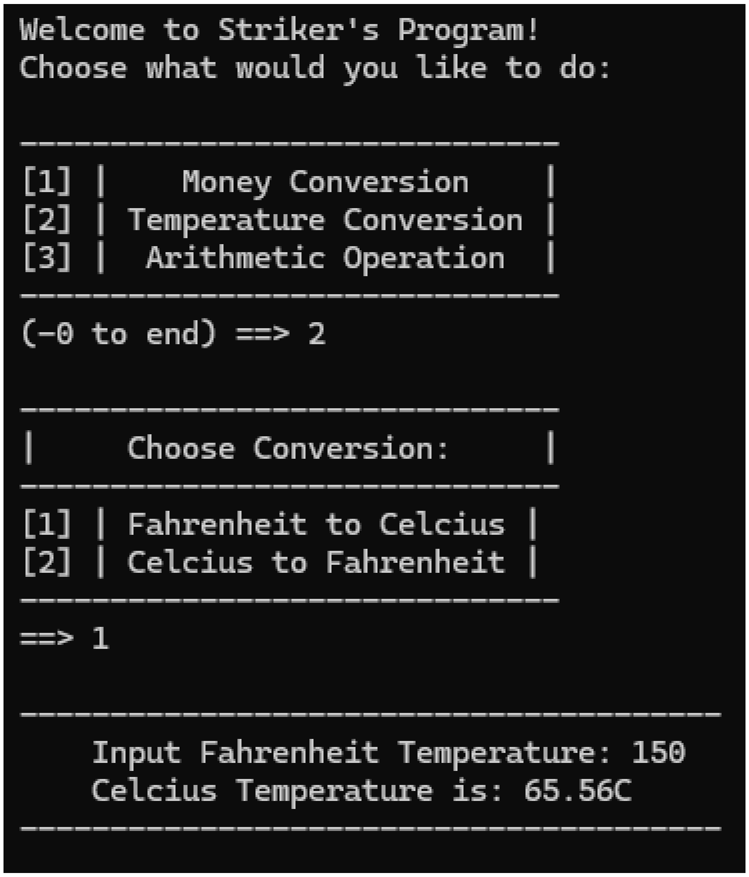


```
Welcome to Striker's Program!
Choose what would you like to do:

------------------------------
[1] |    Money Conversion    |
[2] | Temperature Conversion |
[3] |  Arithmetic Operation  |
------------------------------
(-0 to end) ==> 1

------------------------------
|     Choose Conversion:     |
------------------------------
[1] | PHP Peso ==> US Dollar |
[2] | US Dollar ==> PHP Peso |
------------------------------
==> 1

---------------------------------------
Input PHP Peso amount        : PHP 1500
Converted amount to US Dollar: 25.50$
---------------------------------------
```

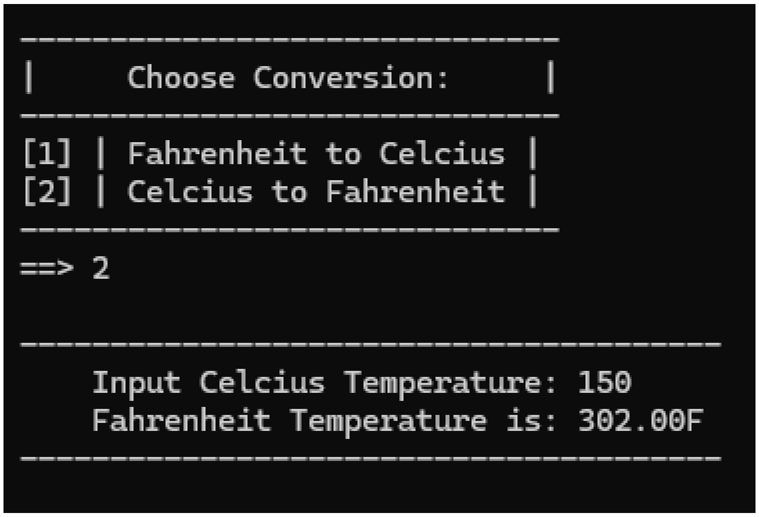


```
------------------------------
|     Choose Conversion:     |
------------------------------
[1] | PHP Peso ==> US Dollar |
[2] | US Dollar ==> PHP Peso |
------------------------------
==> 2

---------------------------------------
Input US Dollar amount: 1500
Converted amount to PHP Peso: 87180.00 PHP
---------------------------------------
```

[Conversion of Temperature]

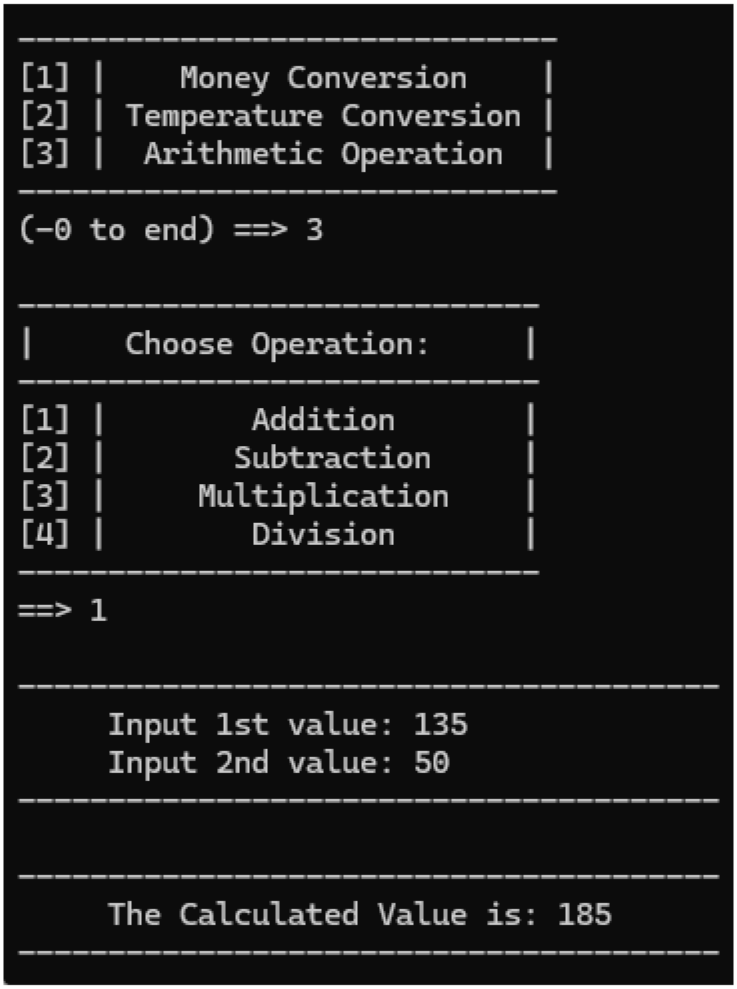


```
Welcome to Striker's Program!
Choose what would you like to do:

------------------------------
[1] |    Money Conversion    |
[2] | Temperature Conversion |
[3] |  Arithmetic Operation  |
------------------------------
(-0 to end) ==> 2

------------------------------
|     Choose Conversion:     |
------------------------------
[1] | Fahrenheit to Celcius |
[2] | Celcius to Fahrenheit |
------------------------------
==> 1

---------------------------------------
    Input Fahrenheit Temperature: 150
    Celcius Temperature is: 65.56C
---------------------------------------
```



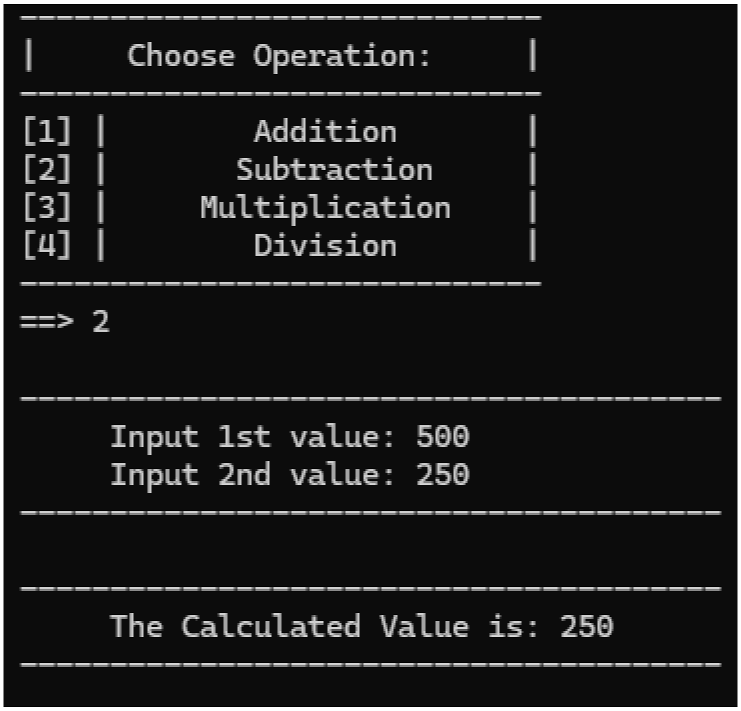
```
------------------------------
|     Choose Conversion:     |
------------------------------
[1] | Fahrenheit to Celcius |
[2] | Celcius to Fahrenheit |
------------------------------
==> 2

---------------------------------------
    Input Celcius Temperature: 150
    Fahrenheit Temperature is: 302.00F
---------------------------------------
```

[Arithmetic Operations]



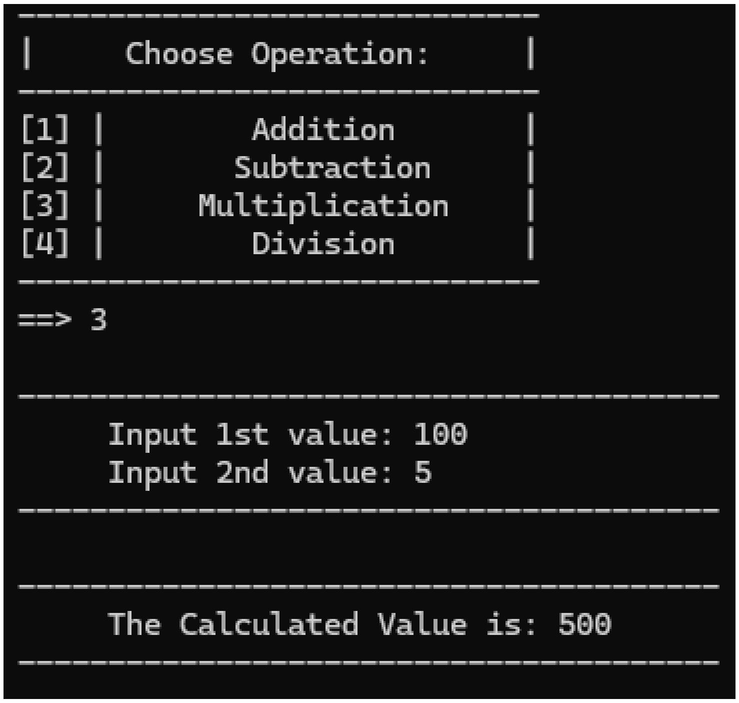
```
------------------------------
[1] |    Money Conversion    |
[2] | Temperature Conversion |
[3] |  Arithmetic Operation  |
------------------------------
(-0 to end) ==> 3

-----------------------------
|     Choose Operation:     |
-----------------------------
[1] |        Addition       |
[2] |       Subtraction     |
[3] |     Multiplication    |
[4] |        Division       |
-----------------------------
==> 1

---------------------------------------
     Input 1st value: 135
     Input 2nd value: 50
---------------------------------------

---------------------------------------
     The Calculated Value is: 185
---------------------------------------
```

Addition



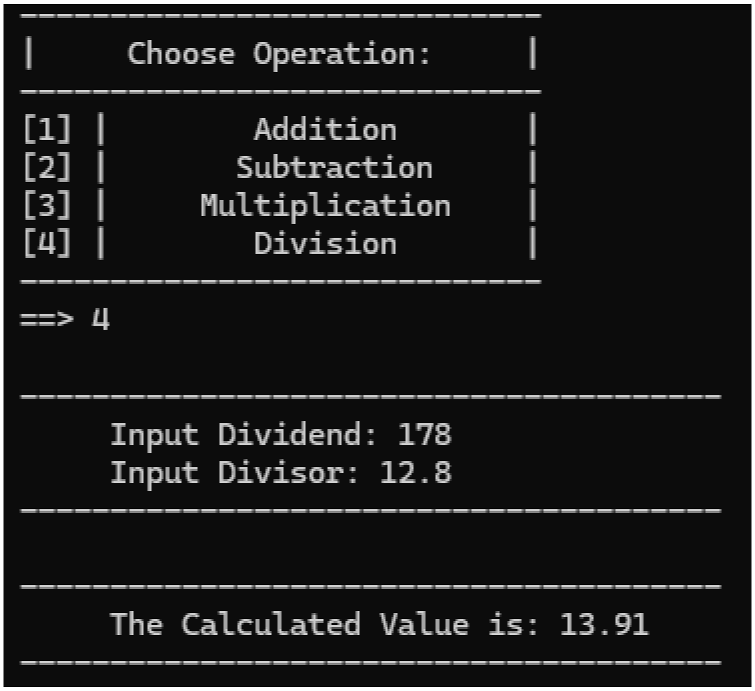
```
-----------------------------
|     Choose Operation:     |
-----------------------------
[1] |        Addition       |
[2] |       Subtraction     |
[3] |     Multiplication    |
[4] |        Division       |
-----------------------------
==> 2

---------------------------------------
     Input 1st value: 500
     Input 2nd value: 250
---------------------------------------

---------------------------------------
     The Calculated Value is: 250
---------------------------------------
```

Subtraction

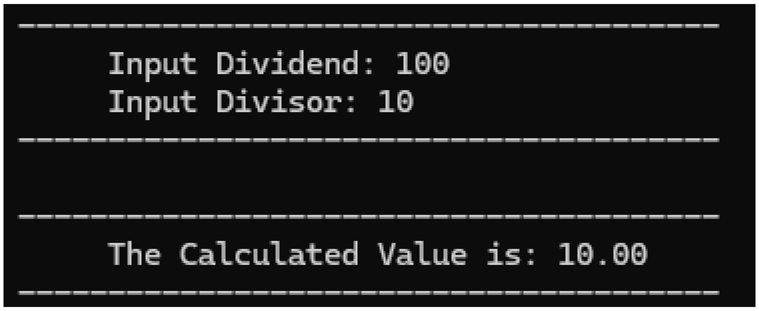


```
-----------------------------
|     Choose Operation:     |
-----------------------------
[1] |        Addition       |
[2] |       Subtraction     |
[3] |     Multiplication    |
[4] |        Division       |
-----------------------------
==> 3


---------------------------------------
     Input 1st value: 100
     Input 2nd value: 5
---------------------------------------


---------------------------------------
     The Calculated Value is: 500
---------------------------------------
```

Multiplication



```
-----------------------------
|     Choose Operation:     |
-----------------------------
[1] |        Addition       |
[2] |       Subtraction     |
[3] |     Multiplication    |
[4] |        Division       |
-----------------------------
==> 4


---------------------------------------
     Input Dividend: 178
     Input Divisor: 12.8
---------------------------------------


---------------------------------------
     The Calculated Value is: 13.91
---------------------------------------
```



```
---------------------------------------
     Input Dividend: 100
     Input Divisor: 10
---------------------------------------


---------------------------------------
     The Calculated Value is: 10.00
---------------------------------------
```

Division

7. Supplementary Activity

⇒ [ANALYSIS]:

⇒In this activity, we are tasked to create a program consisting of a declaration of function (prototype) and definition. In this program we have 3 objectives.

1. To create a program that will add, subtract, divide, and multiply a 2 user-input integer values.
2. To create a program that will convert a user-input Fahrenheit to Celsius and vice versa.
3. To create a program that will convert dollars into pesos and vice versa.

Those 3 objectives are required to use functions in their program. Thus, we will have to declare functions (prototype) and function definition. Without further ado let's start in the code analysis of my program.

Starting from the declaration of function, line code 5 - 14, we have used 2 data types, integer and float. We used integer data type in our arithmetic operations such as the addition, subtraction, and multiplication. I decided to use float in the division since it potentially may include decimal points. but at the same time, it is a flexibility to have between both integer and float. I used float data types in certain programs, especially when dealing with money (cents) and temperature Fahrenheit and Celsius. This declaration contains a variable of:

Arithmetic Operation = ***val1*** & ***val2***, [***difVal1*** & ***difVal2***] = (Division)
Temperature = ***fah*** (Fahrenheit), ***cel*** (Celsius)
Money Conversion = ***php*** (Philippines Currency) & ***usd*** (Dollar Currency)

Now, let's proceed in the main block, where all the inputs and outputs are relayed and processed for our user.

We used the while-do function for our loop, with a command sentinel of ***(-0)***. We declared ***(int option)*** for the option categories between the 3 programs. Which was the:

[1] Money Conversion
[2] Temperature Conversion
[3] Arithmetic Operation

This program is represented and declared in line 22 - 29. The "***option***" variable holds the decision process of the switch-case function. In the switch-case function, we are taking the user's input to decide which case will be processed according to what the user would like to use. Now let's start exploring each program that is assigned to each cases.

First Case: 1 (line code: 35 - 75), the **Money Conversion Program**. In this program we used the if-else function to decide whether what type of conversion would our user want to use, Either converting PHP currency to USD currency, or the other way around. As always, we declared our needed variables, I used a float data type since we are dealing with currency. The declared variable (***int choice***), holds the decision for the if-else statement function. The if-else function therefore holds the type of conversion to process that is depending on the declared variable "***choice***". Inside the if-else statements consist of getting the user's input desired amount to convert. This conversion program holds the latest value conversion.

it also includes the processing of the declared function definition and declaration. I separated the user input function in each conversion to maintain an organized user prompt to specify the program needs such as, "***amount of php to convert***" or vise versa on the second if-else function that holds the usd convert.

Second Case: 2 (line code: 77 - 116), is the **Temperature Conversion Program**. In this program, It consists of the same function declaration and if-else statement function code structure of the Money Conversion Program, but in this representation, we are converting temperature Fahrenheit and Celsius. It may have the same structure, but the variables differ from one another. The variable " ***fah*** " holds the user input's value of Farenheit, on the other hand, the variable " ***cel*** " holds the user input's value of Celsius.

In the if-else functions, Same code structure but different variables, it consists the user input's prompt for requesting the required temperature to convert, and prints out the result within the function process of function definition.

Lastly, the last program Case: 3 (line code: 118 - 186), the **Arithmetic Operations**. In this program function, I have created 2 else-if functions. One is for the user/s to be able to choose between what operation they want to proceed in calculating their input values, and another one is for the calculated result. One is on float data type result, and one is for integers for more accurate data. This program also consists of another switch-case function, which is for the function definition to be processed according to the user's input decision. The (int arithmChoice) are used in both if-else and switch-case functions for the decision making of what to proceed and to prompt in terms of what the user inputs as a choice.

line code: 189 loops the function and it is the one that uses the command sentinel (***-0***) for the loop to end.

The last block of codes, outside the main block, are what we can call the function definitions. These are all the functions that process the calculation, formulas, prompts, and result outputs. In the first line of codes (194 - 203), this is the function definition of the 1st program, the Money Conversion. As you can see, assign constant values in certain variables to imply the fixed price per php or dollar in terms of conversion. It also consists of the formula on how to get the conversion, by multiplying the fixed price per conversion that corresponds to what is being converted.

In the second line of codes (207 - 214), this is the function definition of the 2nd program, which is the Temperature Conversion. The temperature conversion only consists of 1 function, which is the processing of formula for the result of the temperature. Compared to the Money Conversion, it consists of a constant value.

In the last set of line of codes (218 - 233), is for our last program, which is the Arithmetic Operations. In this function definition, I have used the basic structure of defining a function which is by declaring the process into a variable and returning that variable. It's all the same in all types of operations.

Overall, In the function definition, we will always need to return the value in order for the program to display the result/s inside the main block. The code is quite long due to the amount of organization and restrictions for the accuracy and less bug experience in the system. This is for error possibilities such as inputting a number that isn't in the choice, or no line space which makes the layout confusing and ugly, and creating a more structured layout for the user to easily see the contents and options. Although I still lack the ability to perceive better approaches and code structuring layouts, but I assure myself that I can make it better in the future and be more concise and be able to apply an advance set of code structure, and still be able to achieve the Intended Learning Outcome (ILO).

8. Conclusion

⇒ Overall, In the function definition, we will always need to return the value in order for the program to display the result/s inside the main block. The code is quite long due to the amount of organization and restrictions for the accuracy and less bug experience in the system. This is for error possibilities such as inputting a number that isn’t in the choice, or no line space which makes the layout confusing and ugly, and creating a more structured layout for the user to easily see the contents and options. I think I was able to interpret the analysis well, step by step per code functions, and their purpose per functions. Although I believe that I still lack the ability to perceive better approaches and code structuring layouts, but I assure myself that I can make it better in the future and be more concise and be able to apply an advance set of code structure, and still be able to achieve the Intended Learning Outcome (ILO).