Hands-on Activity 6.1	
Functions	
Course Code: CPE007	**Program:** Computer Engineering
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6. Output

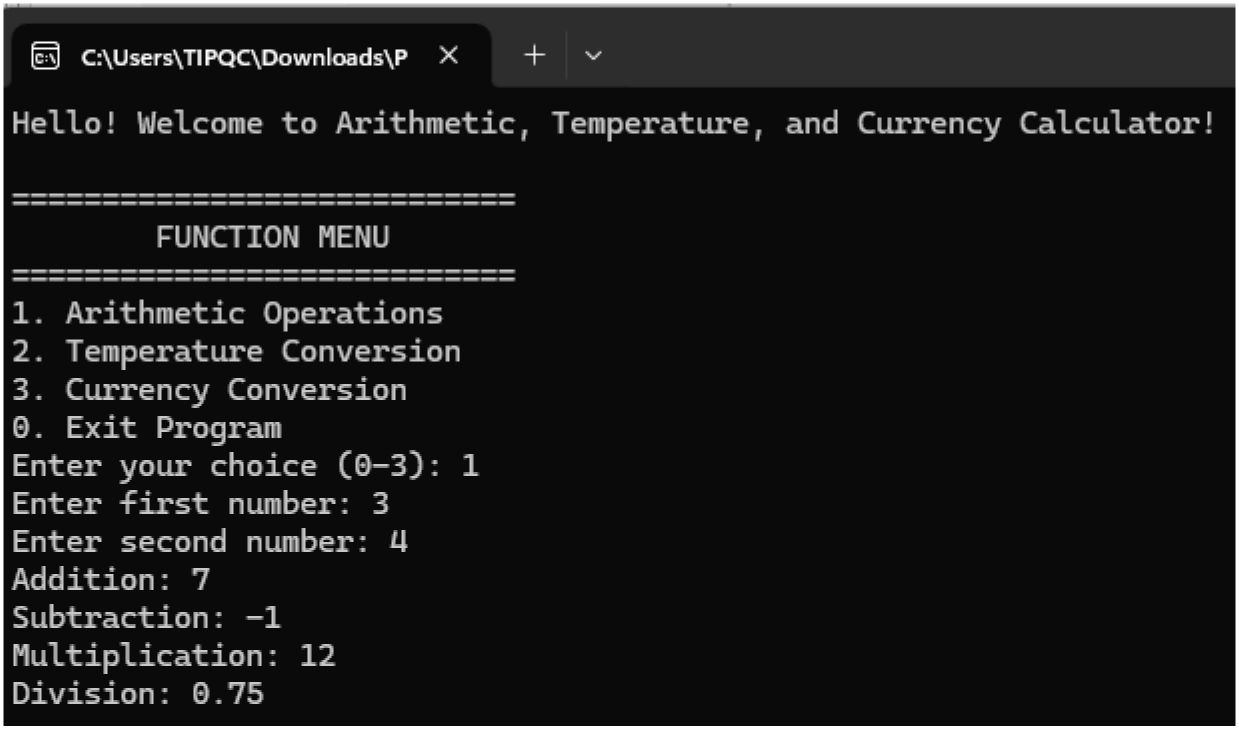
Code :

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

/* ===== Functions Declaration ===== */
void userMenu();            // User Greetings
void arithmeticComp(float a, float b); // Arithmetic
void temperatureComp(int operation, float temperature); // Temperature (Fahrenheit to Celsius and Celsius to Fahrenheit)
void currencyComp(int operation, float currency); // Currency Conversions (Peso to Dollar, Dollar to Peso)

int main() {
            cout << "Hello! Welcome to Arithmetic, Temperature, and Currency Calculator!" << endl;
    int userChoice;

    do {
        userMenu();
        cin >> userChoice;

        if (userChoice == 1) {
            float a, b;

            cout << "Enter first number: ";
            cin >> a;
            cout << "Enter second number: ";
            cin >> b;
            arithmeticComp(a, b);
        }
                        else if (userChoice == 2) {
            int operation;
            float temperature;
            cout << "Choose an Operation:\n";
            cout << "1. Fahrenheit to Celsius\n2. Celsius to Fahrenheit\n";
            cin >> operation;
            cout << "Enter the temperature: ";
            cin >> temperature;

            temperatureComp(operation, temperature);
        }
                        else if (userChoice == 3) {
```

```
            int operation;
            float currency;
            cout << "Choose a Conversion:\n";
            cout << "1. Dollar to Peso\n2. Peso to Dollar\n";
            cin >> operation;
            cout << "Enter amount: ";
            cin >> currency;

            currencyComp(operation, currency);
        }
                            else if (userChoice == 0) {
            cout << "Goodbye!" << endl;
        } else {
            cout << "Invalid Main Menu choice!" << endl;
        }

    } while (userChoice != 0);

    return 0;
}

/* ===== Functions Definitions ===== */
void userMenu() {
    cout << "\n=============================\n";
    cout << "        FUNCTION MENU       \n";
    cout << "=============================\n";
    cout << "1. Arithmetic Operations\n";
    cout << "2. Temperature Conversion\n";
    cout << "3. Currency Conversion\n";
    cout << "0. Exit Program\n";
    cout << "Enter your choice (0-3): ";
}

/* Arithmetic */
void arithmeticComp(float a, float b) {
    cout << "Addition: " << a + b << endl;
    cout << "Subtraction: " << a - b << endl;
    cout << "Multiplication: " << a * b << endl;
    if (b != 0) {
        cout << "Division: " << a / b << endl;
    } else {
        cout << "Division is Undefined, Denominator = 0" << endl;
    }
}

/* Temperature */
void temperatureComp(int operation, float temperature){
    if (operation == 1) {
        cout << "Fahrenheit to Celsius: " << (temperature - 32) * 5 / 9 << "C" << endl;
    }
    else if (operation == 2) {
        cout << "Celsius to Fahrenheit: " << (temperature * 9 / 5) + 32 << "F" << endl;
    }
    else {
        cout << "Invalid Operation" << endl;
    }
}

/* Currency (1 USD = 58 PHP) According to Google Finance */
void currencyComp(int operation, float currency){
    if (operation == 1) {
        cout << "Dollar to Peso: " << currency * 58 << " Pesos" << endl;
    }
    else if (operation == 2) {
        cout << "Peso to Dollar: " << currency / 58 << " Dollars" << endl;
    }
    else {
        cout << "Invalid Conversion" << endl;
    }
}
```

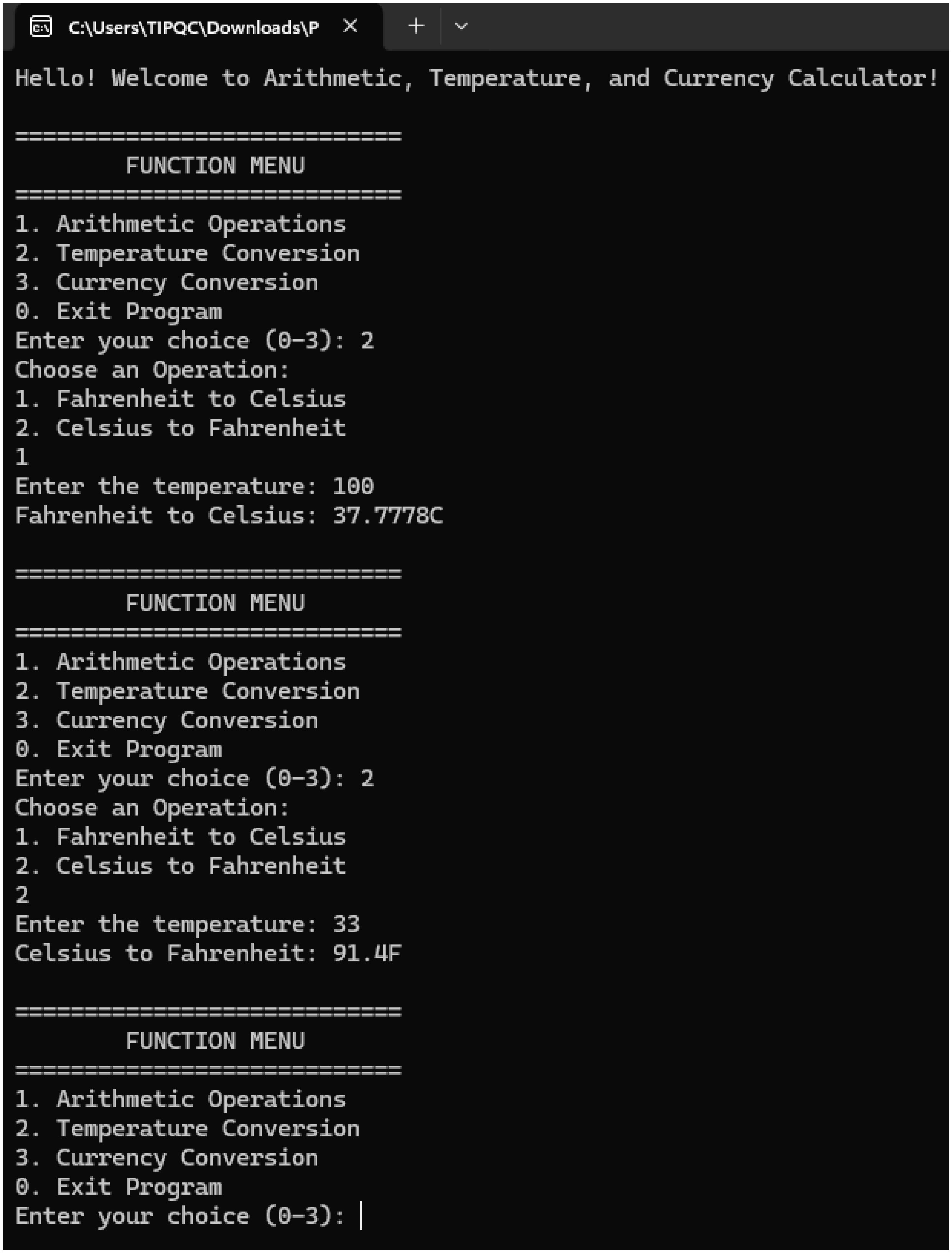
Code Output :

Arithmetic Operations :



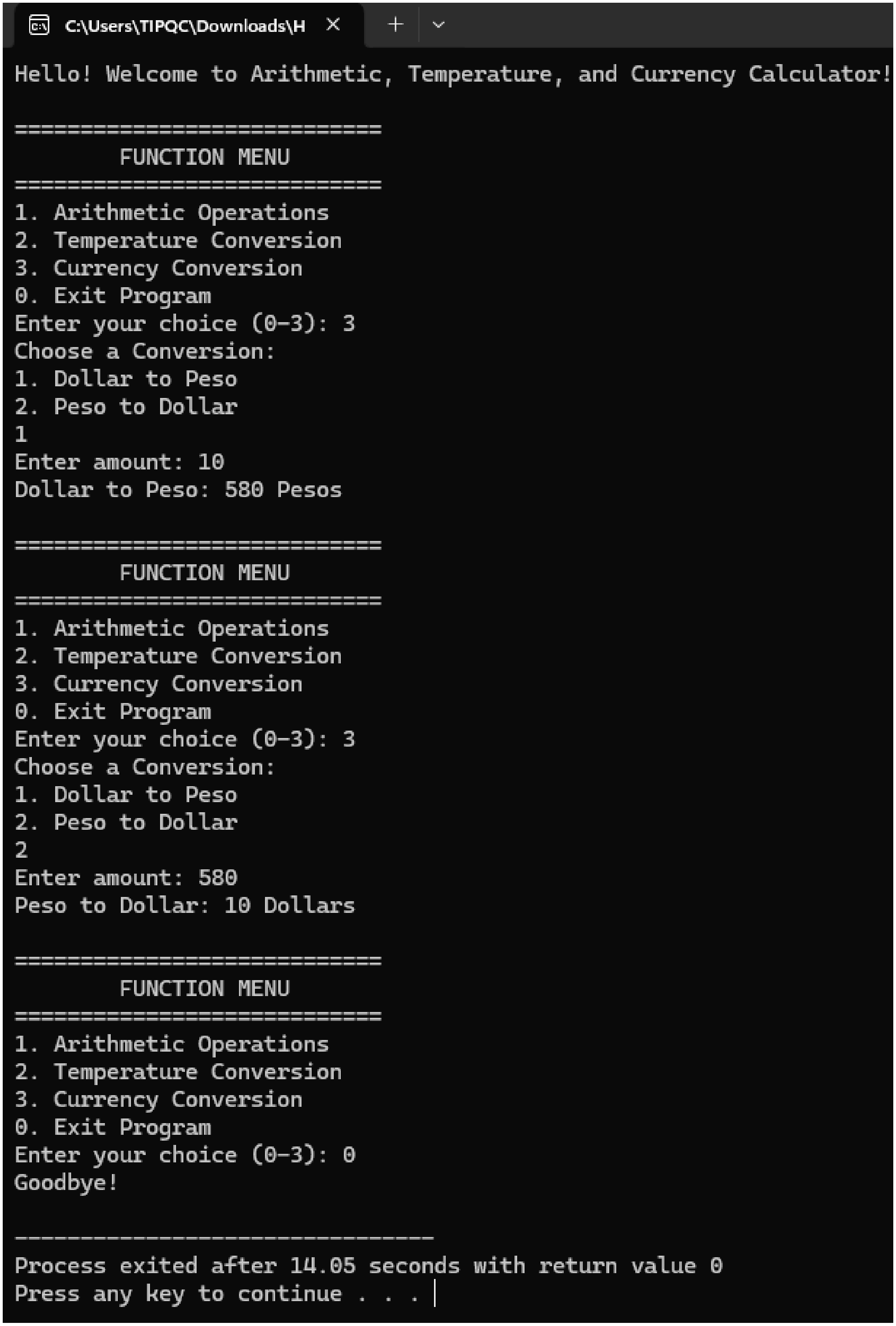
```
Hello! Welcome to Arithmetic, Temperature, and Currency Calculator!

============================
        FUNCTION MENU
============================
1. Arithmetic Operations
2. Temperature Conversion
3. Currency Conversion
0. Exit Program
Enter your choice (0-3): 1
Enter first number: 3
Enter second number: 4
Addition: 7
Subtraction: -1
Multiplication: 12
Division: 0.75
```

Temperature:



```
Hello! Welcome to Arithmetic, Temperature, and Currency Calculator!

============================
        FUNCTION MENU
============================
1. Arithmetic Operations
2. Temperature Conversion
3. Currency Conversion
0. Exit Program
Enter your choice (0-3): 2
Choose an Operation:
1. Fahrenheit to Celsius
2. Celsius to Fahrenheit
1
Enter the temperature: 100
Fahrenheit to Celsius: 37.7778C

============================
        FUNCTION MENU
============================
1. Arithmetic Operations
2. Temperature Conversion
3. Currency Conversion
0. Exit Program
Enter your choice (0-3): 2
Choose an Operation:
1. Fahrenheit to Celsius
2. Celsius to Fahrenheit
2
Enter the temperature: 33
Celsius to Fahrenheit: 91.4F

============================
        FUNCTION MENU
============================
1. Arithmetic Operations
2. Temperature Conversion
3. Currency Conversion
0. Exit Program
Enter your choice (0-3):
```

Currency:



```
Hello! Welcome to Arithmetic, Temperature, and Currency Calculator!

=============================
        FUNCTION MENU
=============================
1. Arithmetic Operations
2. Temperature Conversion
3. Currency Conversion
0. Exit Program
Enter your choice (0-3): 3
Choose a Conversion:
1. Dollar to Peso
2. Peso to Dollar
1
Enter amount: 10
Dollar to Peso: 580 Pesos

=============================
        FUNCTION MENU
=============================
1. Arithmetic Operations
2. Temperature Conversion
3. Currency Conversion
0. Exit Program
Enter your choice (0-3): 3
Choose a Conversion:
1. Dollar to Peso
2. Peso to Dollar
2
Enter amount: 580
Peso to Dollar: 10 Dollars

=============================
        FUNCTION MENU
=============================
1. Arithmetic Operations
2. Temperature Conversion
3. Currency Conversion
0. Exit Program
Enter your choice (0-3): 0
Goodbye!

---------------------------------
Process exited after 14.05 seconds with return value 0
Press any key to continue . . .
```

7. Supplementary Activity

Code Analysis :

In my program, I used functions and a loop to make it easier to organize and reuse the code. The purpose of this program is to perform different operations such as arithmetic, temperature, and currency conversions. I decided to use functions because they make the program more readable and help separate each task clearly. Each part of the program has its own function so that it's easier to edit or fix later if needed.

I started the C++ Program with a header file of #include <iostream> for the code outputs and its functionality since this will be used for user inputs and printing. Then, I implemented using namespace std; to avoid the redundancy of "std" usage. Before I started the main function, I implemented 4 Functions which shows the user menu then, arithmetic where there are; (Addition, Subtraction, Multiplication, and Division) inside it then, temperature (which measures the celsius and fahrenheit), and currency computation (Which consist peso to dollar and vice versa).

At the beginning of my main function, I printed a greeting message for the user to display a welcome message to the user. This makes the program look more interactive instead of just showing plain numbers. After that, I created a menu with the usage of a function called userMenu that lets the user choose what kind of operation they want to do. I added a loop so that after finishing one operation, the program goes back to the main menu automatically. The loop continues until the user chooses 0 to exit. I used a loop because it makes the program continuous, so the user doesn't have to keep reopening it again and again.

For the arithmetic part, I didn't separate functions so that the 2 given integers will add(+), subtract(-), multiply(*), and divide(/). Each function accepts two integer inputs and then returns the result based on the chosen operation. This part of the program helps in performing quick basic calculations.

For the temperature conversion, I combined both fahrenheit and celsius calculation into one function so that I can quickly minimize the overall usage of lines. These functions convert Fahrenheit to Celsius and vice versa. I used the proper formulas for each conversion. Having these as separate functions makes the code look cleaner and prevents confusion. It's also easier to reuse these conversions if I ever need them in another project.

For the currency conversion, I made another function which both converts dollars to peso and vice versa without being separated. These are for converting dollars to pesos and pesos to dollars using the exchange rate of 1 USD = 58 PHP I based the currency on Google Finance and news. I used these functions because it's simpler to just call them whenever needed instead of repeating the formula multiple times in the main code.

Lastly, I used if-else statements to check user inputs and show error messages, like when dividing by zero or entering an invalid option. This helps prevent errors and makes the program more user-friendly. Overall, I used functions and loops to make the program more organized, efficient, and easier to use. It also helped me understand how important modular programming is when creating larger systems.

8. Conclusion

In conclusion, I learned that the use of functions in a program makes it more organized, readable, and easier to manage. Functions help separate each part of the program according to its purpose, which makes finding and fixing errors simpler. Instead of writing the same code again and again, I can just create one function and call it whenever I need it. This saves time and makes the program look cleaner. Through this activity, I also understood the importance of programming where each function handles a specific task, such as arithmetic operations, temperature conversion, or currency conversion. It made my program more efficient and flexible. Overall, functions are very useful in programming because they make the code reusable, easier to understand, and more professional. Therefore after performing this activity, I realized how useful functions are in simplifying and organizing my code. Learning how to apply them will help me in future programming activities because I can now create cleaner, reusable, and more efficient programs with less effort. Additionally, I found this activity very beneficial and helpful as my team is going to be working on a project in which we are going to apply

CRUD which is to create, read, update, and delete. I can say that with the usage of functions this project is going to be less stressful and difficult.