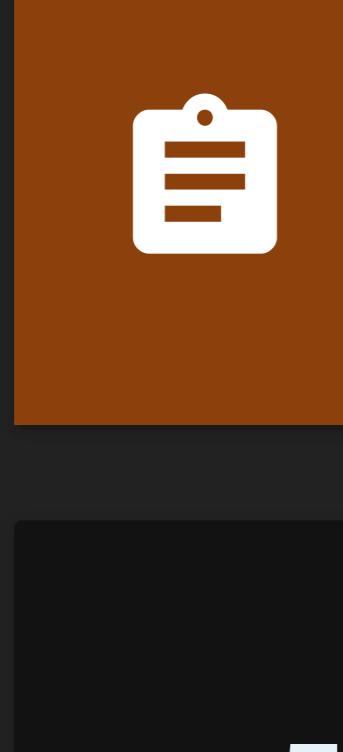


↑ 5.5 Functions with branches



Students:

Section 5.6 is a part of 2 assignments: CSC108 CH05.1-5.7 C5A ▾

Includes: CA

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5.6 Functions with loops

Example: Computing the average of a list of numbers

The following example uses a function with a for loop to calculate the average of a list of numbers.

Figure 5.6.1: Computing the average of a list of numbers.

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

double ComputeAverage(int numCount) {
    double valuesSum = 0;
    int currValue = 0;

    for (int i = 0; i < numCount; ++i) {
        cout << "Enter number: ";
        cin >> currValue;
        valuesSum += currValue;
    }
    return valuesSum / numCount;
}

int main() {
    int numValues;
    double averageVal;

    cout << "Enter number of values: ";
    cin >> numValues;
    averageVal = ComputeAverage(numValues);

    cout << "Average: ";
    cout << fixed << setprecision(3) << averageVal << endl;
    return 0;
}
```

```
Enter number of values: 3
Enter number: 10
Enter number: 5
Enter number: 5
Average: 6.667
```

[Feedback?](#)**PARTICIPATION ACTIVITY** | 5.6.1: Analyzing the compute average program.

- 1) How many calls to user-defined functions exist in main()?

[Check](#)[Show answer](#)

- 2) What does ComputeAverage() return if the input is 4 2 3 4 5? Type as #. Note: The first number is the number of values in the list.

[Check](#)[Show answer](#)[Feedback?](#)

Example: Least-common multiple calculator

The following is another example with user-defined functions. The functions keep main()'s behavior readable and understandable.

Figure 5.6.2: User-defined functions make main() easy to understand.

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

// Function prompts user to enter positive non-zero number
int PromptForPositiveNumber() {
    int userNum;

    userNum = 0;

    while (userNum <= 0) {
        cout << "Enter a positive number (>0): " << endl;
        cin >> userNum;

        if (userNum <= 0) {
            cout << "Invalid number." << endl;
        }
    }

    return userNum;
}

// Function returns greatest common divisor of two inputs
int FindGCD(int aVal, int bVal) {
    int numA;
    int numB;

    numA = aVal;
    numB = bVal;

    while (numB != numA) {
        if (numB > numA) {
            numB = numB - numA;
        }
        else {
            numA = numA - numB;
        }
    }

    return numA;
}

// Function returns least common multiple of two inputs
int FindLCM(int aVal, int bVal) {
    int lcmVal;

    lcmVal = abs(aVal * bVal) / FindGCD(aVal, bVal);

    return lcmVal;
}

int main() {
    int usrNumA;
    int usrNumB;
    int lcmResult;

    cout << "Enter value for first input" << endl;
    usrNumA = PromptForPositiveNumber();

    cout << endl << "Enter value for second input" << endl;
    usrNumB = PromptForPositiveNumber();

    lcmResult = FindLCM(usrNumA, usrNumB);

    cout << endl << "Least common multiple of " << usrNumA
    << " and " << usrNumB << " is " << lcmResult << endl;

    return 0;
}
```

```
Enter value for first input
Enter a positive number (>0):
13
Enter value for second input
Enter a positive number (>0):
7
Least common multiple of 13 and 7 is 91
```

[Feedback?](#)**PARTICIPATION ACTIVITY** | 5.6.2: Analyzing the least common multiple program.

- 1) Other than main(), which user-defined function calls another user-defined function? Just write the function name.

[Check](#)[Show answer](#)

- 2) How many user-defined function calls exist in the program code?
-
- Note: abs() is not a user-defined function.

[Check](#)[Show answer](#)[Feedback?](#)**CHALLENGE ACTIVITY** | 5.6.1: Output of functions with loops.

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[Start](#)

Type the program's output

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

```
int Compute(int val1, int val2) {
    int result = 1;
    int i;
```

```
    for (i = 0; i < val1; ++i) {
        result *= val2 + 3;
    }
}
```

```
return result;
}
```

```
int main() {
    int value1 = 4;
    int value2 = 1;
    int computedValue;
```

```
    computedValue = Compute(value1, value2);
    cout << computedValue << endl;
}
```

```
return 0;
}
```

```
256
```

1

2

3

4

[Check](#)[Next level](#)[Feedback?](#)**CHALLENGE ACTIVITY** | 5.6.2: Functions with loops.

620890_5010016.q3zqy7

[Start](#)

Define a function PrintVal() that has two integer parameters and outputs the product of all integers, starting with the first integer parameter and ending with the second, followed by a newline. PrintVal() should not return any value.

Ex: If the input is 3 6, then the output is:

360

Note: Assume the first integer parameter is less than the second.

```
1 #include <iostream>
2 using namespace std;
3
4 /* Your code goes here */
5
6 int main() {
7     int in1;
8     int in2;
9
10    cin >> in1;
11    cin >> in2;
12
13    PrintVal(in1, in2);
14
15    return 0;
16 }
```

1

2

3

4

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