

CS 150 Lab - Functions

The purpose of today's lab is for you to get some hands-on experience with breaking up your programs into functions.

- **Be sure to answer the given questions before you start**
- Be sure your output looks exactly like the specified output
- Be sure to place each project in a folder called PUNetIdFunctionsLab. When you have completed the required projects, drop your folder in **CS150-02 Lab** when you are done. (By noon on Friday)
- Show the instructor or TA your solution before submitting it

Lab 1

For this lab, you will need to create a new Visual Studio project that will contain your source code. Name this project "MarkupXXXXXXXX", replacing the XXXXXXXXX with your PUNetID.

Write a program that asks the user to enter an item's wholesale cost and its markup percentage. It should then display the item's retail price.

The program should have a function named **printHeading** and a function named **calculateRetail** that receives the wholesale cost and the markup percentage as arguments, and returns the retail price of the item.

Input Validation: If the user inputs a negative number for either the wholesale cost or the markup percentage, then you need to ask the user to enter the numbers again.

```
*****
*   Retail Price Calculator   *
*****

Enter the item's wholesale cost: $5.00
Enter the item's markup percentage: 100
The retail price is: $10.00
Would you like to calculate the price of another item? Y

Enter the item's wholesale cost: $5.00
Enter the item's markup percentage: 50
The retail price is: $7.50
Would you like to calculate the price of another item? N

Thank you.
```

What data is your function going to need? What will be the function's parameters?

What is the return value of the function, and what will be contained within the function body?

What will be in the main function?

Lab 2

For this lab, you will need to create a new Visual Studio project that will contain your source code. Name this project "TemperatureXXXXXXXX", replacing the XXXXXXXXX with your PUNetID.

You are to write a program that will convert temperatures from Celsius to Fahrenheit and vice versa.

The formula for converting a temperature from Fahrenheit to Celsius is:

$$C = 5/9 (F - 32)$$

The formula for converting a temperature from Celsius to Fahrenheit is:

$$F = (C * 9/5) + 32$$

Write four functions for this program; (1) **printHeading** will print the programs heading for the user, (2) **getSelection** will print the selection interface with the user and return the user's selection, (3) **celsius** will convert a Fahrenheit temperature to Celsius, and (4) **fahrenheit** will convert a Celsius temperature to Fahrenheit. Write a

function and test it. Then write the next function and test it. Do not write more than one function before testing.

```
*****
*      Temperature Converter      *
*****

Please select one of the following:
  1. Fahrenheit to Celsius
  2. Celsius to Fahrenheit
  3. Quit

Your selection: 1

Thank you. Please enter the temperature in Fahrenheit: 64

64F is equal to 18C.

Please select one of the following:
  1. Fahrenheit to Celsius
  2. Celsius to Fahrenheit
  3. Quit

Your selection: 2

Thank you. Please enter the temperature in Celsius: 18

18C is equal to 64C.

Please select one of the following:
  1. Fahrenheit to Celsius
  2. Celsius to Fahrenheit
  3. Quit

Your selection: 3

Thank you for using this program. Goodbye.
```

What data are your functions going to need? What will be the functions' parameters?

What are the return values of the functions, and what will be contained within the function bodies?

What will be in the main function?
