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Activity 13.5 Creating Reusable Functions

Many Python programmers create a library of functions that they reuse again and again. These functions may take care of common tasks like validating an email address or connecting to a specific database. One of the main reasons to structure a program with functions is that it encourages reuse. Why do the same work over and over again, when you can reuse working functions that you've already written?

In this exercise you're going to write two functions— one that converts a celsius temperature to a fahrenheit temperature and one that does the opposite. Here are the formulas you will need to complete this exercise:

```
fahrenheit = celsiusTemperature * (9.0 / 5.0) + 32.0

celsius = (fahrenheitTemperature - 32.0) * (5.0/9.0)
```

1) Using your IDLE development environment create a new document called conversions.py.

2) Open your document and define a function called **celsiusToFahrenheit**. The function should take a celsius temperature as a parameter. Using that parameter the equivalent fahrenheit temperature should be calculated. The fahrenheit value should be returned to the caller. Do not print any results in this function.

3) Define a second function called FahrenheitToCelsius. Write the function so that it takes a fahrenheit temperature as a parameter and returns a celsius temperature.

4) Create a third function called display menu. The function code is listed below:

```
def showMenu():
        print "A:  Convert celsius to fahrenheit"
        print "B:  Convert fahrenheit to celsius"
        print "X:  Exit"
```

5) After the showMenu() function call the showMenu() function to display the menu.

6) Create a while loop which has the continuation condition **option != "X"**. Query the user for the option they are selecting from the menu and store their choice in a variable called option.

7) Implement the loop so that each time through the loop the following tasks are executed:

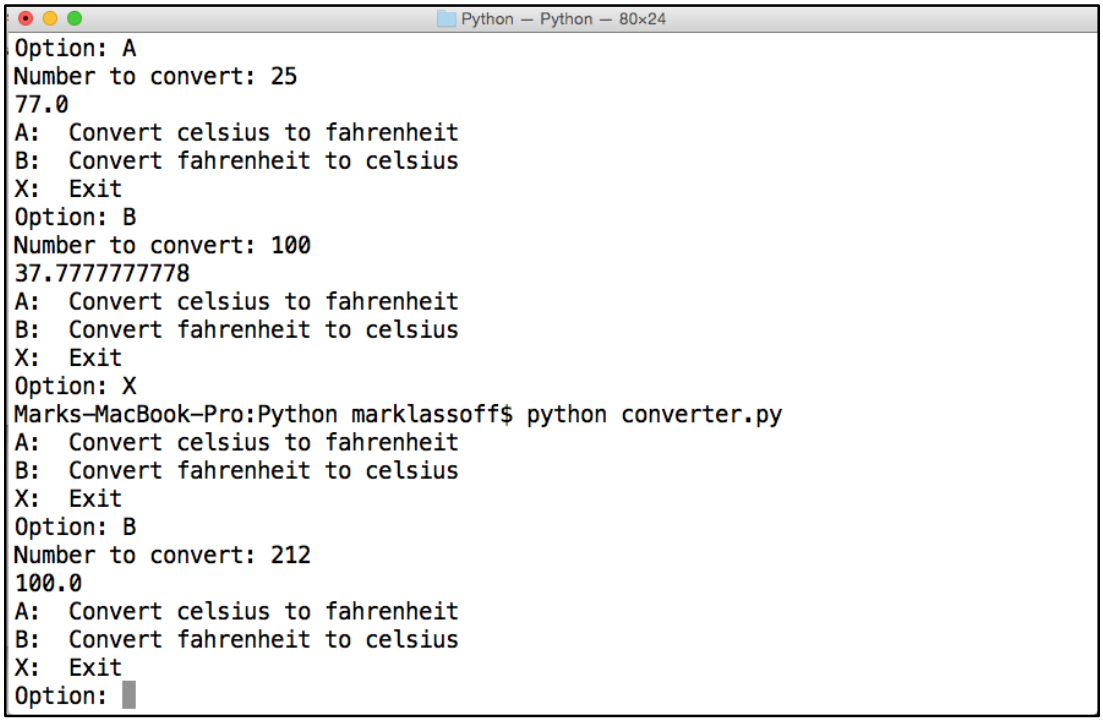
a) Query the user to input the value they'd like to convert and store it in a variable called "value".

b) Write two if statements. The first tests for option "A" from the menu and, if selected, converts the value using the celsiusToFahrenheit function and prints the result. **Hint:** You must convert value to a floating point number with float() before sending it to the function.

   The second statement test for option "B" from the menu and, if selected, converts the value using the fahrenheitToCelsuis function and prints the result. **Hint:** You must convert value to a floating point number with float() before sending it to the function.

c) The showMenu() function is called and the user is again asked to input their option at the end of the loop. This is done to prevent the program from terminating until the user types "X" at the menu option.

   Your output should look similar to below when you run the program:



8) Add some code to deal with unpredictable users. For example— What if a user enters "Y" at the menu?