Intro to Python – Lesson 21

Today we are going to look at Functions. Functions are blocks of code that can be created and tested on their own. When complete they can be added to a program and called when needed. A common example of functions is a menu-based program – where each option in the menu is set up as a separate function – great for team-based projects. Check out the following video on writing functions – contains a bit more detail than we want right now but a really good reference.

https://www.youtube.com/watch?v=u-OmVr_fT4s - Introduction to functions

Write each of the following functions – these functions are all in one and include all the input, processing, and output for a function. Write and test each function.

Convert Celsius to Fahrenheit will accept a Celsius temperature from the user, convert it to Fahrenheit using the formula F = 9 / 5 * C + 32, and print the results.

Determine Training Heart Rate will determine the Training Heart Rate for a user. The function will input the age, and the resting heart rate of a person. To calculate the THR, first subtract the age from 220, subtract the resting heart rate from the first result, and finally, multiply result 2 by 60%, and add the resting heart rate. Display results.

How many days to Christmas? Will take the current date and determine how many days to Christmas. HINT – what happens if it is currently Dec 28?

How old is an invoice? Will allow the user to enter the company name, the invoice date, and the invoice amount. Calculate the age of the invoice by subtracting the invoice date from the current date. If the invoice is within 30 days display a status of "OK", if it is between 31 and 60 days display the status as "Better think about paying.", and if the invoice is over 60 days old display the status "This one could be in trouble.".

Play my guessing game is a simple guessing game for a number between 1 and 100. Get the program to randomly generate a number. As the user guesses, indicate if they are high or low. Once the user guesses the answer display a message and indicate how many guesses they took.

Creating a menu for processing multiple processes

https://www.youtube.com/watch?v=f3D-w6XMTN8 – He may do some things a bit different than we have done in the past, but the concept of the menu and functions is the same.

Write the following program using functions. The program will display the following menu for the user and allow them to enter a choice. Based on the choice selected, call a function that will complete each task.

Mo's Quick Problems - Main Menu

1. Convert Celsius to Fahrenheit.
2. Determine Training Heart Rate.
3. How many days to Christmas?
4. How old is an invoice?
5. Play my guessing game.
6. Quit

Enter choice (1-6):

```
if Choice == 1:
    CelcToFahr()
elif Choice == 2:
     CalcTHR()
        :
```

Variable Scope

An important aspect of functions and variables is the concept of variable scope – this identifies where a variable is available. Variables will have either Local or Global scope. Look at the following video:

https://www.youtube.com/watch?v=QVdf0LgmICw - Variable Scope
https://www.youtube.com/watch?v=Vj-61I_x3R4 - Counters and Accumulators

Add a line below the main title that reads as follows:

Mo's Quick Problems - Main Menu
Session totals: Temperature: ## THR: ## Days to Santa: ## Old Invoice: ## Guess: ##

These will be counters that count the number of times each option has been used. Initialize counters for each option to 0. Within each function, add 1 to the appropriate counter. When the menu is redisplayed, the counters should start to appear.

These counters will need to be declared globally since they are used and updated in multiple functions.

See you at 1.