Intro to Python – Lesson 24

When you write functions in a program, you can streamline the process by placing the functions in their own .py file, create a library. Now when you start a new project you can import your library and have access to all your functions. Look at the following video that shows you how to create and use a library.

https://www.youtube.com/watch?v=5SGqHlQTxLA

Using the exercise from the previous lesson, move all the functions to a library called FunctSet.py.

Now in the program, import the file using an import statement. I have also assigned the import an alias of FS. This allows you to use the alias when you reference a function rather than the full name of the file.

        import FunctSet as FS

Now when you need one of the functions, use the library as reference it.

        GrossPay = FS.WeekGrossPay(NumHours, PayRate)

This keeps the main program organized and clean. It also makes it easy for multiple people to create the functions – then they are all placed together in the library.

Can you suggest a **set of functions that could be used in every program** we write – Format functions. We can set up functions for formatting and place then in a file called FormatValues.py. As an example, here is a function to format a dollar value with 2 decimal positions. You can set up all formatting functions in this file. I have included a sample file – FormatValues,py.

        def FDollar2(DollarValue):

                # Function will accept a value and format it to $#,###.##.

                DollarValueStr = "${:,.2f}".format(DollarValue)

                return DollarValueStr

Now in your program, whenever you want to format to a dollar value, just wrap the variable in the function call. For example:

        print(f"Item cost: {FV.FDollar2(ItemCost):>10s}")

Complete the following exercise using the FormatValues library. Include at least 3 functions in the program for some calculations – you may set up these functions in a library as well.

Write a program for payroll calculations for ABC Company. Use proper programming style with comments, constants, and spacing. Add a prompt to Continue (Y/N) to allow the program to be repeated as many times as the suer requires.

The user will input the Employee first and last name, the SIN, and the weekly sales. Enter the medical benefits as S / F / C – for self, family, or covered on another policy. Enter a value to determine if the employee wants extra income tax deducted (Y / N). If the user selects Y input the amount of extra tax. Similarly, enter a value to determine if the user wants to make an RRSP contribution (Y / N). If the user selects Y input the amount of the RRSP contribution.
Calculate the commission using a rate of 2% if the Weekly sales are greater than $10,000.00, a rate of 1% for Weekly sales greater than $5,000.00, and $0.00 otherwise. Calculate the gross pay as the commission earned plus a base salary of $500.00. If the Weekly Sales are less than $5,000.00, reduce the base salary by a value equal to 10% of the amount under $5,000.00.

Calculate the income tax using a rate of 20% based on the gross pay, EI as 2.8% of the gross pay, and the CPP as 4.9% of the gross pay. If the Extra tax is Y, add the extra tax amount entered to the income tax calculated. To calculate the extra deductions, add the medical benefits and the RRSP contribution. The medical benefits are $52.00 for Self, $135.00 for Family, and $18.00 if the employee is covered elsewhere – the employee must still contribute to AD & D and Long-Term Disability if they are covered under another policy. The RRSP contribution is the value entered if the user entered Y, and 0 otherwise. The net pay is the gross pay less the income tax, EI, CPP, and the extra deductions.

Display all results with headings and appropriate formats like the guidelines below. Add the FormatValues.py file to the project and import it. Use the functions of that library to produce the required formats for the numbers and dates.

```
ABC Company – Payroll Calculations as of dd-MON-yy

Employee name: XXXXXXXXXXXXXXXXXXXXXXXXX          SIN: XXXXXXXXX

Commission:          $#,###.##     Income tax:          $#,###.##
Base salary:         $#,###.##     EI:                  $#,###.##
                     ---------     CPP:                 $#,###.##
Gross pay:           $#,###.##     Extra deductions:    $#,###.##
                     ---------                          ---------
Net pay:             $#,###.##     Total deductions:    $#,###.##
                     =========                          =========
```

See you at 1.