**Programming Assignment 3**

**Functional Decomposition**

This assignment is an EXTENSION of Programming Assignment 2. In addition to all of the features of Programming Assignment 2, modify your solution as follows:

1. Create a value returning function to calculate total exemption amount. Return the total exemption amount to the calling routine.
2. Create a value returning function to calculate the taxable income. Return the taxable income to the calling routine.
3. Create a value returning function to calculate tax obligation. Return the tax obligation to the calling routine.
4. Create a value returning function to open files. Both the input and output files may be opened using one function. The function must contain the prompt for the user to enter the input file name. You may 'hardcode' the output file names (i.e., does not need to be user-entered). The value returned to the calling routine must indicate a failure for any of the files or a success for ALL files. If an open fails, the CALLING routine displays a message and exits the program.
5. Create a function to close all files prior to program end.
6. Create a function to read the data. Remember, functions may call other functions.
7. Create a function to display the output as indicated in Programming Assignment 2, both to the console and to an output file.
8. Create a function to output the error messages and data to the error file.
9. Each function should have a proper function prototype.
10. Other than constant (CONST) identifiers, NO GLOBAL variables may be used
11. Main should contain the function calls only, no processing other than what is specified for the file open call. Remember, functions may call other functions.
12. You may use the SAME data file created for Programming Assignment 2
13. Each function must have required documentation (pre and post conditions).

**Test and evaluate calculations for accuracy. Points will be taken for inaccurate calculations, improper formatting, directions not followed.**

Turn in file code \*.cpp; README file; all input and output files file. You DO NOT need to submit the executable (\*.exe). You MAY zip all the files and submit if you choose. You MUST include all the files indicated or points will be deducted.

README must contain instructions for location of input/output files

**If you had points deducted from Programming Assignment 2 and correct the issues in Programming Assignment 3, I will return 100% of points lost to Programming Assignment 2 grade not attributed to late penalties.**

**Points WILL BE taken if MINIMUM requirements and submissions not included.**

**I’ll award 1 point extra credit if the submission files are zipped and the zip file is submitted.**

Each solution is to be uniquely your own; minimal student collaboration allowed.

See Blackboard and Syllabus for due date