

## Homework #5

**Due** Thursday by 6:30pm    **Points** 88    **Submitting** a file upload  
**Available** Feb 16 at 9:30pm - Feb 23 at 6:30pm 7 days

In this homework you will be writing a module that will perform file parsing and writing. Make sure your module has good doc strings for all functions so that when you perform a `help(homework_5_solution_module)` in the python interpreter that you will have very informative output. You will also be writing a program called `homework_5_solution_program.py` that will determine the differences between two files after first writing a new file that is exactly the same as the input file. This program will be importing `homework_5_solution_module.py`.

### Part 1:

Write a module that has the following functions. Make sure you read carefully the requirements for these functions and follow them EXACTLY. Name this `homework_5_solution_module.py`.

Function called `AskForFileName( )` that will ask the user for the name of the input file. Make sure you put all files in the same directory/folder as this python program. You can download the input file from the course website under Resources -> Homework 5 input -> 1JKB.pdb. Open this file in a text editor since you will have to refer to it when you write the functions below.

Function called `ReadFileContents(file_name )` that will open the file and read all the lines in the file into memory. Name this variable `all_file_contents`.

Function called `BuildHeadList(all_file_contents )`. This function will loop over the variable populated in `ReadFileContents` and append to another list called `head_list` the header information from the file. These are the lines from the top of the file to the lines that start with the word ATOM.

Function called `BuildAtomList(all_file_contents )`. This function will loop over the variable populated in `ReadFileContents` and append to another list called `atom_list` all the lines that begin with ATOM and ONLY these lines.

Function called `BuildTailList(all_file_contents )`. This function will loop over the variable populated in `ReadFileContents` and append to another list called `tail_list` all the lines that are below those that begin with ATOM (the lines left over).

Function called `WriteNewFile( )`. This function will take the three lists created above (`head_list`, `atom_list`, `tail_list`) as arguments and will write these lists to an output file called `output.txt` that should look exactly like 1JKB.pdb when finished writing.

HINT: Look at all the built-in function for the string type (i.e. `dir(str)`). One of these functions will be important when looping through `all_file_contents`.

### Part 2:

Write another program that will import the module you created above so that it can be used by this new program. Name this new program `homework_5_solution_program.py`. This program must have the following functions. Make sure you read carefully the requirements for these functions and following them EXACTLY.

A function called `Run( )` that will call `AskForFileName( )` in the module you imported. `Run( )` will then call the rest of the functions defined above in the same order they are defined above. `Run( )` will finally call `DifferenceTwoFiles( file_1, file_2)`.

Function called `DifferenceTwoFiles( file_1, file_2)` that will take in the name of two files as parameters. The order passed does not matter. Make sure the files are saved in the same directory as this python program. This function will open both files reading in all lines into two separate variables and compare the two to determine if the files are different. This function will accomplish this by looping over the elements of the first variable and checking if the second variable contains the same line in the same order. If there is a difference, then the element that is different should be appended to a list call `diff_list`. This list should then be counted for the number of differences and that number output.

Print out a copy of your homework and bring it to class. Make sure to include the output.