Student name Akmal Ataev

**TASK 1**

Create **one single Jupyter Notebook file** with all your Python code generated and submit that file by responding to this assignment.

* Start the notebook with a Markdown section with your name, student ID and title of the assignment.
* Each exercise solution in your notebook should start with one Markdown section indicating its number (e.g. # EX 40) or the HW code for part B (B1, etc.). They should be ordered as in the book and as above for part B.
* If the exercise provides alternative ways of coding to create the same functionality, use the best option to complete it and ensure that the notebook code runs. If you need to use an alternative solution (e.g. some instructions cannot be implemented using the notebook), you need to add a comment section to describe what you did.
* Any data files used need to be submitted as well and they need to run from a subfolder named "data" (do not include absolute path, use only relative paths in your code).
* Include comments to explain your code, as necessary (when it is not clear what the code does, even if the book explains it). You also need to include, within the respective Exercise section, both the code that does not run and comments with a statement indicating that it cannot run from within Jupyter and concisely stating why it cannot run and what you did to complete the exercise.

Submit:

1. The Jupyter Notebook

2. A PDF copy of your Jupyter Notebook. To obtain a PDF copy you can Save As PDF.  If section of your code is not visible in the PDF, adding a blank line and/or moving sections of your code to another cell will address this issue.

To receive a PASS grade:

* Your code must run without issues. If issues cannot be resolved then comments, as noted above, should be included
* Your code should be minimal so as to answer the stated questions and follow the instructions provided in the exercises (extra unnecessary code will result in No Pass)
* Your files should be named as "Your Last Name your first Name HW#***.ipynb***", and "Your Last Name your first Name HW#***.PDF***" using the assignment title number.
* You need to follow instructions fully and submit the assignment by its due date.

**Task 2:**

Complete **Exercises 13 through 39**from the main textbook.

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4. You need to follow instructions fully and submit the assignment by its due date.

**TASK 3:**

Write a program that gives simple math quizzes. The program should display two random numbers that are to be added, such as:

  247  
+ 129

The program should allow the student to enter the answer. If the answer is correct, a message of congratulations should be displayed. If the answer is incorrect, a message showing the correct answer should be displayed.

**B2.**

Create a text file that contains your expenses for last month in the following categories:

* Rent
* Gas
* Food
* Clothing
* Car payment
* Misc

Write a Python program that reads the data from the file and uses matplotlib to plot a pie chart showing how you spend your money. For your submission run the program using the attached "expenses.txt" file

**B3.**

Write a program that reads the contents of two text files and compares them in the following ways:

* It should display a list of all the unique words contained in both files.
* It should display a list of the words that appear in both files.
* It should display a list of the words that appear in the first file but not the second.
* It should display a list of the words that appear in the second file but not the first.
* It should display a list of the words that appear in either the first or second file, but not both.

Start each section with the appropriate label ("List of all the unique words contained in both files: ", etc.).

Hint: Use set operations to perform these analyses.

Run your program using the attached .txt files

**B4.**

In a particular factory, a shift supervisor is a salaried employee who supervises a shift. In addition to a salary, the shift supervisor earns a yearly bonus when his or her shift meets production goals.  
Write a ShiftSupervisor class that is a subclass of the Employee class in the attached python script.

You should :

* update the attached script
* include it in your submission (copy the entire script in a new cell at the end of your notebook - do not submit the .py file)
* save the updated script itself as .py and make use of it by importing it in your main program.

Demonstrate the class by writing a program that uses a ShiftSupervisor object.

**Additional Instructions  (up to 20%):**

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