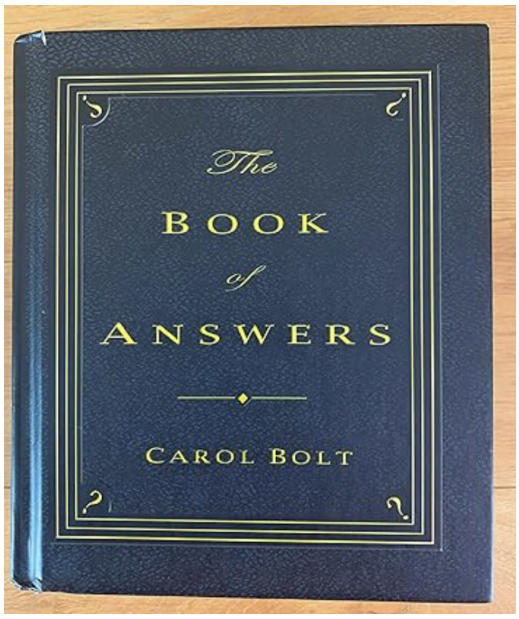
Homework #3: The Book of Answers - Digital Version

With this digital book of answers, the user can:

- ❖ Ask a question
- ❖ Open to a page randomly
- ❖ Receive an answer (You can specify your own answers in the book)



Example:

- The user opens the book
- The digital book of answers prompts the user to ask a question
- The user asks: "Will I change majors?"
- The digital book of answers gives one of the established answers
- The digital book of answers continues to ask for the next question until the user closes the book

(picture from Amazon https://www.amazon.com/Book-Answers-Carol-Bolt/dp/0786865660)

Instructions

In this assignment, you will be writing the ***DigitalBookofAnswers*** class with the following methods:

1. An **__init__(self, answers)** method: This will initialize a new ***DigitalBookofAnswers*** class
   - Set the attribute ***book_answer_list*** to the ***answers*** argument***.*** This is a list of the possible answers a user could receive from the book.
   - Set the attribute ***questions_asked_list*** to an empty list, this is used to store the asked questions.
   - Set the attribute ***answered_list*** to an empty list, this is used to store the indices of the picked answers.
2. A **__str__(self)** method**:**
   - Returns a string with all of the answers in ***book_answer_list,*** separated by dashes:

```
Follow Your Inner Voice – Stay Positive – Go For It – Believe in Yourself – Stay Open to the Future – Enjoy It
```

   - If ***book_answer_list*** is empty, return an empty string like "".

3. A ***check_get_answer(self, question)*** method:

- First, check if the question has been asked before
  - If it has, this method returns a string "I've already answered this question. The answer is: <answer>" with the actual answer to that question. e.g. return "I've already answered this question. The answer is: Follow Your Inner Voice"
  - ***Note:*** When it is a repeated question, you should not add the index of this answer to the ***answered_list*** again.
- If the question has not been asked before, pick an answer at random from ***book_answer_list*** and return the answer in a string "<answer>".
  - Add the index of that answer at the end of ***answered_list***
  - ***Note:*** You need to add the index of the answer in the ***book_answer_list*** to the ***answered_list*** here.
  - ***Hint:*** Python has a built-in module that you can use to make random numbers: random module

4. An ***open_book(self)*** method: This method controls the book use for the ***DigitalBookofAnswers*** object

- If it is a new session, prompt the user to ask a question: "Turn 1 - Please enter your question: "
- If the question input is "Done" (case-sensitive) then print "Goodbye! See you soon." and stop the current loop of question-prompting.
- Otherwise, add the question to the ***questions_asked_list*** and use the **check_get_answer()** method to generate an answer. The steps are below:
  - Print out the answer
  - Add the question at the end of ***questions_asked_list***
  - Prompts the user to ask the next question. The turn number in this string should be updated: "Turn <turn_number> - Please enter your question: "
    - ***Hint:*** You can use the length of ***questions_asked_list*** to get what the next turn number should be

5. An ***answer_log(self)*** method**:** This method prints out the answers

- Using the ***answered_list*** to count how many times each answer is given to unique questions.
- Returns a list with frequency information for all the answers, each item in the list is a string, the string should look like "<number_of_times> - <answer>".
  - ***Note*****:** <answer> in this list should all be lowercase.
- The returned list should be sorted based on the number_of_times each answer is given to unique questions (starting from the most frequently given one). If several answers have the same number_of_times, the sequence does not matter.
  - ***Hint:*** You can use ***.sort()*** if you are more familiar with list
- If there are no answers in ***answered_list,*** it will print "Empty" (case-sensitive) and return an empty list.

6. A ***main()*** function:
   - Create the ***DigitalBookofAnswers*** object and pass in a list of possible answers as ***book_answer_list***. For example:
     - Follow Your Inner Voice
     - Stay Positive
     - Go For It
     - Believe in Yourself
     - Stay Open to the Future
     - Enjoy It
   - Initiate the book using the ***open_book()*** method
   - Shows the output of the ***answer_log()*** method in the terminal screen

Given the example possible answers, here are two sample outputs from the main method: *Note: As the answers are picked randomly, your output might be different from the sample outputs.*

```
Turn 1 – Please enter your question: Done
Goodbye! See you soon.
Empty
[]
```

In this example,

- There are no actual questions asked, so the ***answered_list*** is empty, so it prints out "Empty"
- It also returns an empty list as the output of the ***answer_log(self)*** method.
- This output is shown in the terminal screen following the requirement in the ***main()*** function.

```
Turn 1 - Please enter your question: Should I have sushi now?
Follow Your Inner Voice
Turn 2 - Please enter your question: Should I have sushi now?
I've already ansered this question. The answer is: Follow Your Inner Voice
Turn 3 - Please enter your question: Should I have sushi now?
I've already ansered this question. The answer is: Follow Your Inner Voice
Turn 4 - Please enter your question: Should I go to park now?
Go For It
Turn 5 - Please enter your question: I am lost
Enjoy It
Turn 6 - Please enter your question: Should I sleep now?
Go For It
Turn 7 - Please enter your question: Done
Goodbye! See you soon.
['2 - go for it', '1 - follow your inner voice', '1 - enjoy it', '0 - stay positive',
 '0 - stay open to the future', '0 - believe in yourself']
```

In this example,

- The same question (Turn 1 to Turn 3) is asked three times, so the second two answers included "I've already answered this question. The answer is:" and only the first answer turn is included in ***answered_list,*** and used when counting the frequency of answers used for unique questions.
- Turn 4: a new question with a new answer
- Turn 5: a new question with a new answer
- Turn 6: a new question with an answer appeared for a different question before (Turn 4). The index of this answer in the ***book_answer_list*** needs to be added to ***answered_list*** as it is responding to a new unique question.
- The user entered Done at Turn 7, so it prints "Goodbye! See you soon."
- It then shows the frequency information for each answer in a sorted list: starting with the one that is used twice to answer unique questions (Turn 4 and Turn 6), followed by the one that is used once to answer a unique question (Turn 1), and the remaining replies.

Grading Rubric - Total of 60 Points

- 5 points: the ***__init__*** method sets the object's ***book_answer_list,*** ***questions_asked_list,*** and ***answered_list*** correctly to the passed arguments, sets both the object's ***questions_asked_list*** and ***answered_list*** attributes to an empty list.
- 5 points: the ***__str__*** method
    - 3 points - When ***book_answer_list*** is not empty, return a string with all the possible answers in ***book_answer_list*** separated by dashes:
        - "Follow Your Inner Voice-Stay Positive"
    - 2 points - Otherwise, return an empty string like ""
- 5 points: the **check_get_answer** method returns "I've already answered this question. The answer is: <answer>" if the question has already been asked
- 5 points: the **check_get_answer** method adds the index of the answer to the ***answered_list***
- 5 points: If it is a new session, the ***open_book*** method prompts the user to ask a question: "Turn 1 - Please enter your question: "
- 5 points: the ***open_book*** method continually prompts the user for a question, using the prompt "Turn <turn_number> - Please enter your question: " as long as they don't input "Done"
- 5 points: the ***open_book*** method adds the questions to ***questions_asked_list***
- 5 points: the ***open_book*** method uses the **check_get_answer*()*** method to correctly get the answer
- 5 points: ***answer_log*** returns a formatted list with the information for each of the answers from ***answered_list,*** <answer> in this list should all be lowercase.
- 5 points: ***answer_log*** sorts the returned answer_log correctly
- 2 points: ***answer_log*** returns an empty list if there are no answers in ***answered_list.***
- 2 points: ***book_answer_list*** is properly defined and used in the ***main()*** function
- 2 points: the ***DigitalBookofAnswers*** object is properly defined and used in the ***main()*** function
- 2 points: the ***open_book*** method is used correctly in the ***main()*** function
- 2 points: the ***answer_log*** method is used and displayed correctly in the ***main()*** function

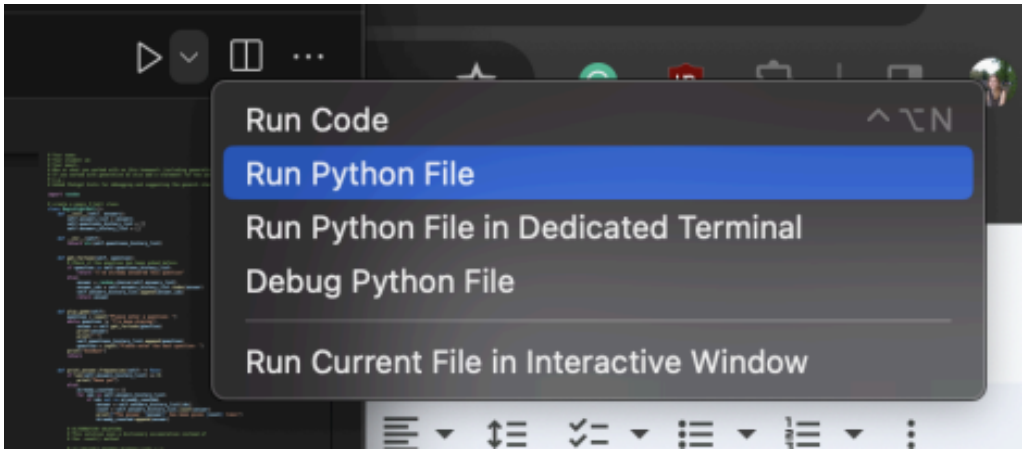
Extra Credit: 6 points

Create a **my_test()** function that creates a DigitalBookofAnswers object and tests each of the possible outcomes.

- **1 point:** Correct output from ***answer_log*** when no questions have been asked.
- **2 points:** Correct behavior from ***answer_log*** when ***answers_list*** is ['Stay Positive', 'Go For It', 'Enjoy It'] and ***answered_list*** (store the indices of the picked answers) is [2, 1, 2]
    - **Hint:** you can modify the value of attributes on a class that's already been created. For example, if your ***DigitalBookofAnswers*** object is called, you can make ***answered_list*** equal to an empty list by setting ***DigitalBookofAnswers***.answered_list = []
- **1 point:** Correct prompt from ***open_book*** to ask the first question "Turn 1 - Please enter your question: "
- **1 point:** Correct output from ***check_get_answer*** when the same question is asked twice.

Running Your Code:

If you are having trouble running your code / interacting with the program in VSCode, click the arrow in the top right corner of your VSCode window. Then, hit "Run Python File."



Submission instructions:

Follow the instructions on Canvas to submit your git repo link by the due date and time.