

Homework #3 - Make a Magic 8 Ball

For this assignment, you will be writing a *Magic 8 Ball* class with the following:

- **A constructor (`__init__`) method:** The constructor will initialize a new *Magic_8_Ball* object from the passed list of all possible answers.
 - Set *answer_list* to the passed list of possible answers.
 - Set *question_list* to an empty list. This will hold all the questions that have been asked.
 - Set *answer_history_list* to an empty list. This will hold the indices of all of the answers that have been generated.
- **`__str__` method:** It should return a string with all of the answers in *answer_list* separated by commas, For example : "No, Yes, Better not tell you now."

```
Testing the __str__ method  
['Yes', 'No', 'Ask again', 'Maybe', 'Not clear']
```

- ***check_question* method:** Checks if the current question is already in the *question_list* and if so returns *"I've already answered that question"*, otherwise it adds the current question to the *question_list* and returns the answer from *shake_8_ball*.

```
Asking the Question: Should I study today?  
Not clear
```

```
Asking the Question: Should I study today? (again)  
I've already answered that question
```

- ***shake_8_ball* method:** Returns a random answer from the *answer_list*. It adds the index to the end of the *answer_history_list*. It returns a string containing the answer at that index (not the index).
- ***print_question_history* method:** Prints the content of the *answer_history_list* with the answer index in [] and each question and answer on a separate line. It does not return anything. If there are no items in *answer_history_list* it should print **"None yet"**.

```
Printing the history
[0] Will I pass this semester? - Yes
[1] Should I study today? - No
[0] Is SI 206 the best class ever? - Yes
```

```
Printing the history when no answers have been generated yet
None yet
```

- **main() function:** Loops until the user types “quit” getting a question from the user, calls the **check_question** method, and prints the question and response from **check_question** as “question - answer” as shown below.

```
Ask a question or type quit: Is the answer 42?
Is the answer 42? - Yes
Ask a question or type quit: quit
```

- Example Output From HW3.py

Sample output from the main method:

```
Ask a question or type quit: Will it rain today?
Will it rain today? - No
Ask a question or type quit: Should I have pizza today?
Should I have pizza today? - Not clear
Ask a question or type quit: Will I get all As this semester?
Will I get all As this semester? - No
Ask a question or type quit: Should I have tacos today?
Should I have tacos today? - Yes
Ask a question or type quit: Will I get all As this semester?
Will I get all As this semester? - I've already answered that question
Ask a question or type quit: quit
```

Sample output from the test method:

```
Testing Magic 8 Ball:
Testing the __str__ method
['Yes', 'No', 'Ask again', 'Maybe', 'Not clear']

Printing the history when no answers have been generated yet
None yet

Asking the Question: Will I pass this semester?
Not clear

Asking the Question: Should I study today?
Maybe

Asking the Question: Should I study today? (again)
I've already answered that question

Asking the Question: Is SI 206 the best class ever?
Yes

Printing the history
[4] Will I pass this semester? - Not clear
[3] Should I study today? - Maybe
[0] Is SI 206 the best class ever? - Yes

Testing most_frequent method with 200 responses
Yes: 36
No: 36
Ask again: 43
Maybe: 38
Not clear: 47
The most frequent answer after 200 was Not clear
```

NOTE: Your output will not look *exactly* like this because we are using *random* and can't predict what it will return.

NOTE 2: You are welcome to replace the answers we have provided in the *main function* with your favorite responses

Grading Rubric - Total of 60 points

- 5 points - the **`__init__`** method sets the object's **`answer_list`** correctly to the passed **`answer_list`** and sets both the object's **`answer_history_list`** and **`question_list`** to an empty list
- 5 points - the **`__str__`** method returns a string with all answers in **`answer_list`** separated by commas : "Yes, No, It depends"
- 5 points - the **`check_answer`** method returns *"I've already answered that question"* if the question has already been asked
- 10 points - the **`check_answer`** method calls the **`shake_8_ball`** method and returns the answer when the user asks a new question and adds the passed question to the **`question_list`**.
- 10 points - the **`shake_8_ball`** method returns a random answer and saves the index of the answer at the end of the **`answer_history_list`**
- 5 points - the **`print_question_history`** function prints **"None Yet"** when there are no items in **`answer_history_list`**.
- 10 points - **`print_question_history`** prints "[index] Question - Answer" for each of the questions in the **`question_list`** and **`answer_history_list`** in order and on a separate line.
- 10 points - the **`main()`** function loops until the user enters "quit" and each time asks the users for a question and prints the ***"question - response"***.

This grading rubric shows how you will gain points, but not all the ways you could lose points.

Extra Credit - 6 points

Implement the following method: Create the ***most_frequent*** method. It needs to find the most frequent answer after shaking the Magic 8 Ball ***n*** times. It takes a number as an input: ***n***, Ex: 200. It resets the **`answer_history_list`** instance variable to an empty list, executes **`shake_8_ball n`** times, prints how many times each answer occurred, and prints the most frequently occurring answer. Choose any one of the top most common answers if there is a tie.

Extra Credit Example Output:

```
Testing most_frequent method with 200 responses  
Yes: 36  
No: 36  
Ask again: 43  
Maybe: 38  
Not clear: 47  
The most frequent answer after 200 was Not clear
```