

CS128 Spring 2022 – Homework 10

Task1a The starter code creates a list of possible responses from a Magic 8 Ball. Update the task to prompt the user to enter a question. The code should then generate a response by picking a random item from the list. Print the user's question and the random response as shown. Run the program several times to ensure each possible response is generated. Recall that `random.randint(n,m)` generates a random integer value between `n` and `m` (inclusive).

Ask the 8 ball a question:Will it rain You asked:Will it rain. Magic 8 ball says:Definitely yes
Ask the 8 ball a question:will it snow You asked:will it snow. Magic 8 ball says:My sources say no
Ask the 8 ball a question:is it cold outside You asked:is it cold outside. Magic 8 ball says:Ask again later

Task1b Copy the code from task1a into another cell task1b. Create an empty list to store the questions asked by the user. Use a for loop to prompt for 4 questions. Add each new question to the question list, and print the question list after each random Magic 8 Ball reply. Print an empty line after the question list before prompting for the next question. For example:

```
Ask the 8 ball a question:is pizza yummy
You asked:is pizza yummy. Magic 8 ball says:Definitely yes
QUESTION LIST:
is pizza yummy

Ask the 8 ball a question:is ice cream delicious
You asked:is ice cream delicious. Magic 8 ball says:Definitely yes
QUESTION LIST:
is pizza yummy
is ice cream delicious

Ask the 8 ball a question:is the moon blue
You asked:is the moon blue. Magic 8 ball says:Ask again later
QUESTION LIST:
is pizza yummy
is ice cream delicious
is the moon blue

Ask the 8 ball a question:is the sun hot
You asked:is the sun hot. Magic 8 ball says:My sources say no
QUESTION LIST:
is pizza yummy
is ice cream delicious
is the moon blue
is the sun hot
```

Task1c Copy the code from task1b into another cell task1c. Instead of looping exactly 4 times, the code should use a while loop to ask questions until the user repeats a question. Do not add

the duplicate question to the question list, stop the loop, and inform the user they repeated a question.

Ask the 8 ball a question: will it rain

You asked: will it rain. Magic 8 ball says: My sources say no

QUESTION LIST:

will it rain

Ask the 8 ball a question: will it snow

You asked: will it snow. Magic 8 ball says: Ask again later

QUESTION LIST:

will it rain

will it snow

Ask the 8 ball a question: will it be sunny

You asked: will it be sunny. Magic 8 ball says: Definitely yes

QUESTION LIST:

will it rain

will it snow

will it be sunny

Ask the 8 ball a question: will it snow

You already asked: will it snow

Task1d Copy the code from task1c into another cell task1d. In addition to keeping a list of user questions, create another empty list to store the actual answers given by the Magic 8 ball. Display the question list and the answer list after each iteration. When a duplicate question is asked, display the original answer (Hint, if the user duplicates the 2nd question, then print the 2nd answer).

```
Ask the 8 ball a question:will it snow
You asked:will it snow. Magic 8 ball says:My sources say no
QUESTION LIST:
will it snow
ANSWER LIST:
My sources say no
```

```
Ask the 8 ball a question:is pizza yummy
You asked:is pizza yummy. Magic 8 ball says:Definitely yes
QUESTION LIST:
will it snow
is pizza yummy
ANSWER LIST:
My sources say no
Definitely yes
```

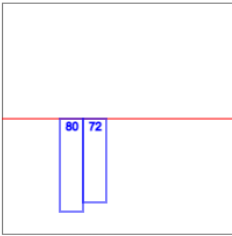
```
Ask the 8 ball a question:is it sunny
You asked:is it sunny. Magic 8 ball says:My sources say no
QUESTION LIST:
will it snow
is pizza yummy
is it sunny
ANSWER LIST:
My sources say no
Definitely yes
My sources say no
```

```
Ask the 8 ball a question:is pizza yummy
You already asked: is pizza yummy and the answer was: Definitely yes
```

Task2a

In this task you will create a program to draw a bar chart from a list of grades. The height of each rectangle in the bar chart corresponds to the grade value.

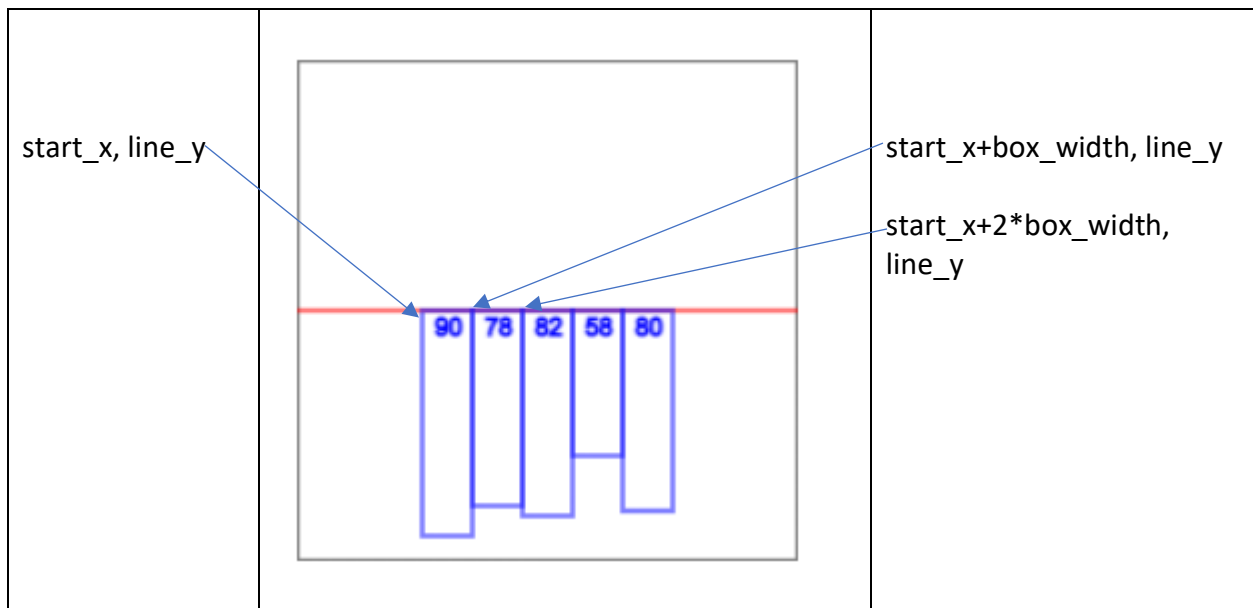
The starter code draws a black border around the canvas, along with a red horizontal line located at $\frac{1}{2}$ the canvas height. The code also draws two framed rectangles for the two variables `grade0` and `grade1`.



Task2b Copy the task2a code into a new cell for task2b. Delete the variables `grade0` and `grade1`. You should create an array to store 5 grades:

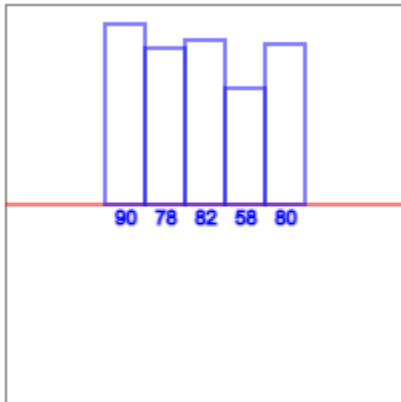
```
grades = [90, 78, 82, 58, 80]
```

Update the code to use a for loop to draw a framed rectangle and text for each value in the `grades` array. The height of the rectangle should be passed on the grade value (i.e. a grade of 90 results in a rectangle with height 90). The **`box_width`** variable should be used for the width of each rectangle. Position the first rectangle at **`start_x, line_y`**. Use the **`box_width`** variable to shift the horizontal position of each subsequent rectangle. Place text representing each numeric grade as shown in the figure below.



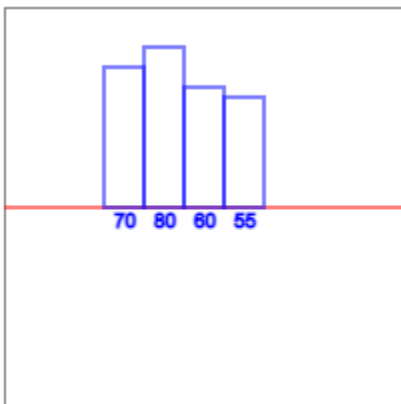
Task2c

Copy the task2b code into a new cell for task2c. Normally the boxes in a bar chart are drawn above the horizontal axis rather than below it. Consider how to position the y value of the upper left corner of each rectangle to produce the bar chart shown. HINT: Given the height of the rectangle, how would you calculate the space above it?



NOTE: Your loop should work for any values that are assigned to the list. Update the list values as shown and confirm the code draws the correct bar chart. You should not have to change the loop code at all.

grades = [70, 80, 60, 55]



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