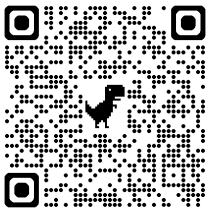
UNIVERSITY OF CALIFORNIA, BERKELEY
Department of Electrical Engineering and Computer Sciences
Computer Science Division

CS10 Fall 2025 **TA: Victoria**



Discussion 4: Iteration + Lists

Instructions:

- If you're attending this section in-person, please log into iClicker!
- If you missed this discussion, fill out this entire worksheet, and upload it to the Gradescope assignment titled "Discussion 4" by next Discussion.

Group Activity / Question of the Day

- Ask the person to you – in front / right / left / behind / – if they'd rather live in a house that's always a bit too hot, or a house that's always a bit too cold. Why? What's the average temperature in your hometown?

Required (Pages 2 - 6):

Section I - Iteration

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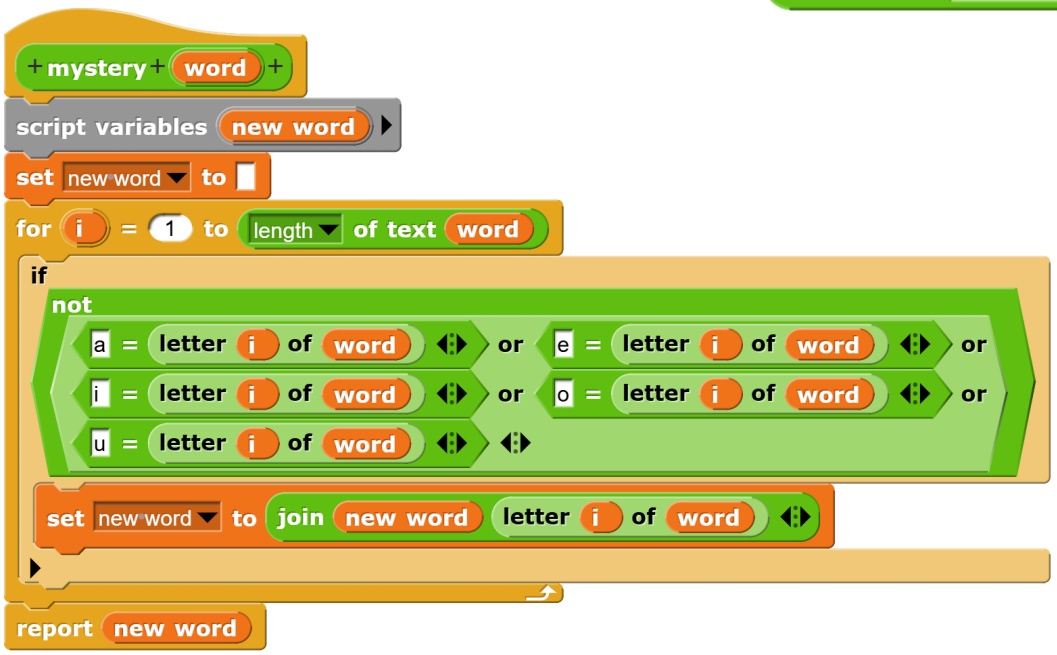
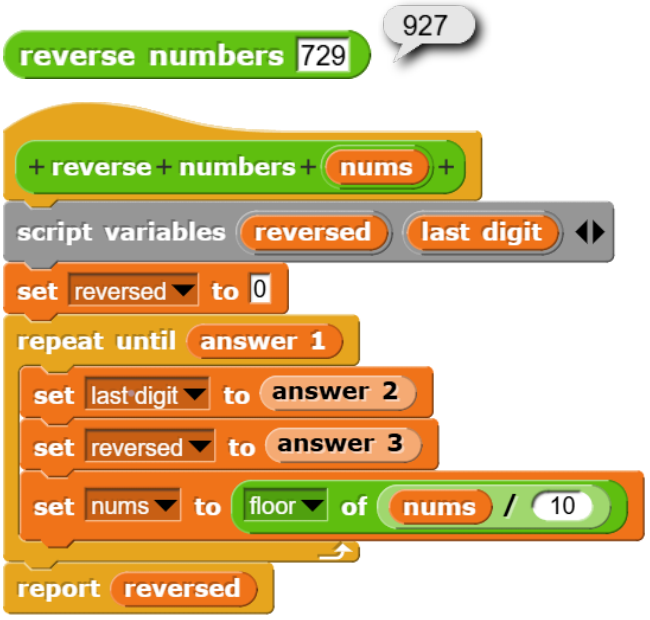
1. What will the following function return, for the input: 



1. Complete the function *reverse numbers (nums)* that takes a positive integer *nums* and returns its digits in reverse order. Use the repeat until block and mathematical operations—do not use string manipulation or the join block.



   a. What should `answer 1` be?

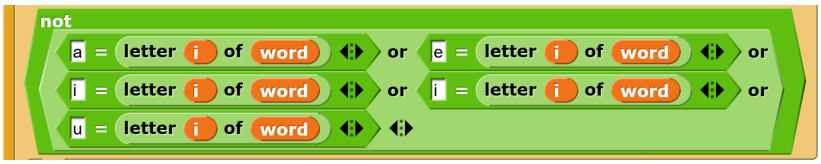
   b. What should `answer 2` be?

   c. What should `answer 3` be?

Section II - Lists

1. Select all the ways I can find the smallest number in a list of numbers:

2. Using the problem from Section. Iteration, Question 1, is there an easier way to write this problem using lists. Specifically, how can we rewrite the if condition with less blocks using list operators?



3. Write a `for loop` that goes through a list of numbers and doubles each item from the list. You will just need to fill out the inside of the `for loop` for this problem. Fill out the rest of the script for each problem:
    a. For this example, you will not be mutating the original list. Instead, you will be returning "`new list`".

    b. Now, you will do the same problem, but you will need to mutate the list using different blocks. You should not create any more script variables, and

you should be returning the original list.

4. Write a function called `decreasing?(list)` which takes in a list of numbers and outputs a boolean. The function should return `true` if all the numbers in the list are in descending order and `false` otherwise

5. Using iteration, write a function that filters out the odd indices (only keep the even indices), and then doubles the value. This is how the function should behave:

Section II - Mutability vs. Immutability

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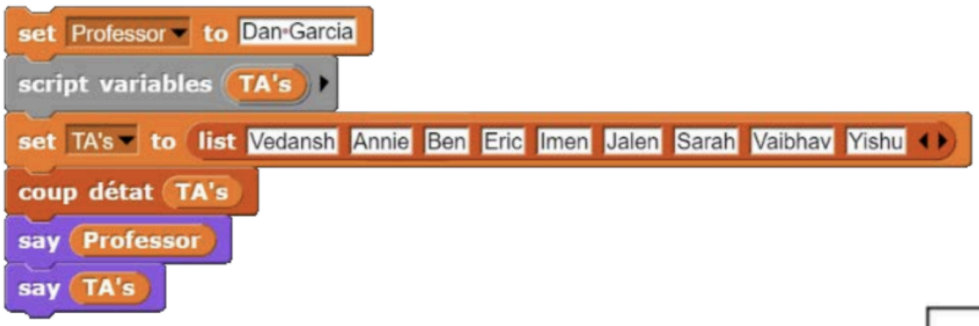
1. Assume we create a global variable named `Professor` and then run the script:

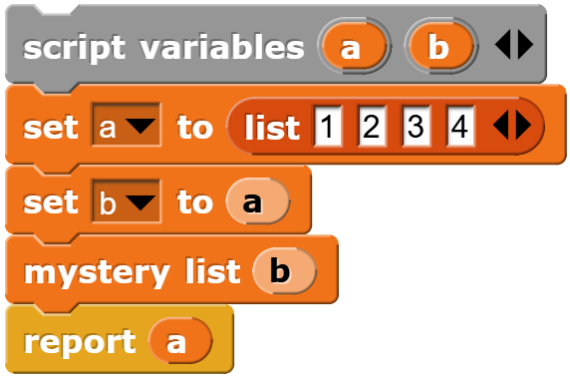


Professor: ☐

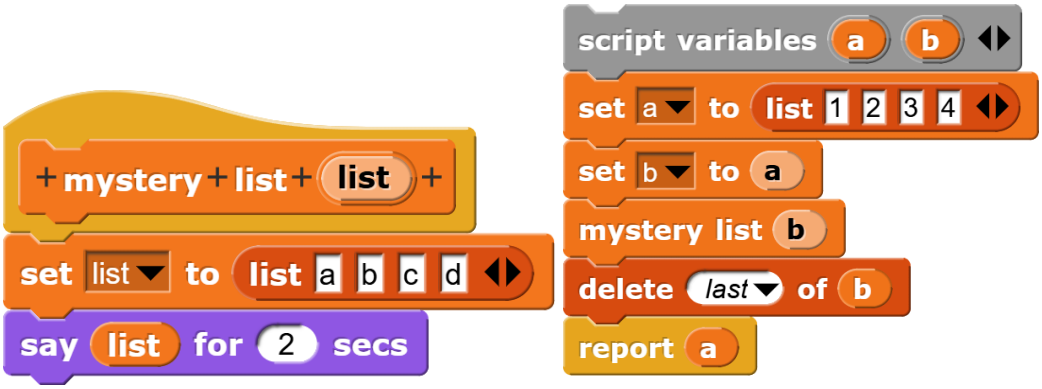
TAs: ☐

2. For each script below, determine what will be reported / said:

3. Using the function, determine what the scripts will output/say



4. Using the function, determine what the scripts will output/say



Optional Extra Practice:

Optional Section I - Lists

Extra Practice

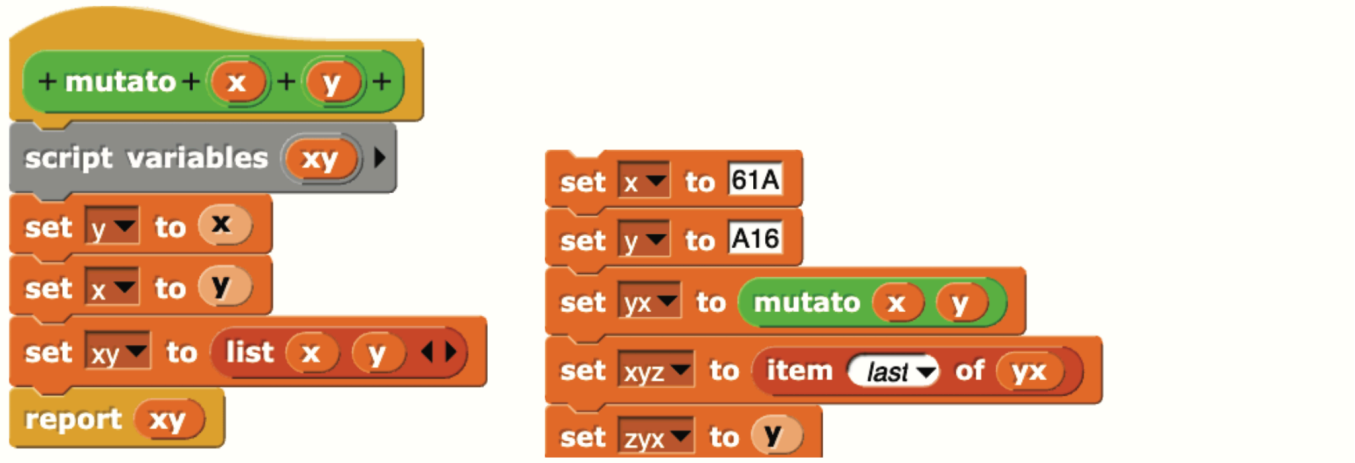
1. You are given a list of pets. Each pet has a name, species, and age. For example, here are the first 3 pets.

a. Return a list of pets who are dogs.

b. Return the age of the oldest pet.

Optional Section II - Mutability vs. Immutability

5. List the values of the global variables: `x, y, yx, xyz, zyx` after the following scripts are executed. Assume `mutato` is defined before the script on the right is executed. If an error is caused, mark the "`ERROR`" bubble instead.



x: ☐ y: ☐ yx: ☐ xyz: ☐ zyx: ☐

◯ ERROR