

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

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

```
+mystery+ word +
script variables new word
set new word to 
for i = 1 to length of text word
if
not
a = letter i of word or e = letter i of word or
i = letter i of word or o = letter i of word or
u = letter i of word
set new word to join new word letter i of word
report new word
```

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?

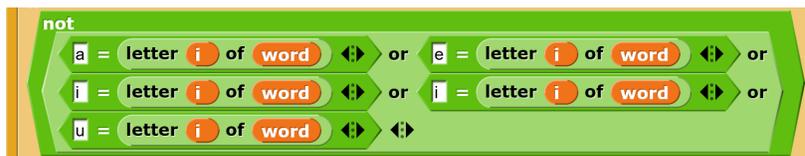
```
reverse numbers 729 927
+reverse+ numbers+ nums +
script variables reversed last digit
set reversed to 0
repeat until answer 1
set last digit to answer 2
set reversed to answer 3
set nums to floor of nums / 10
report reversed
```

Section II - Lists

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

- item 1 of sorted of list 3 8 4 2 1
- combine list 3 8 4 2 1 using min
- find first item min in list 3 8 4 2 1
- minimum list 3 8 4 2 1
- map min over list 3 8 4 2 1

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.

```
script variables list
set list to list 1 2 3 4 5
for i = to
report 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

```
decreasing? list 7 6 5 4 true
decreasing? list 2 7 1 3 4 false
```

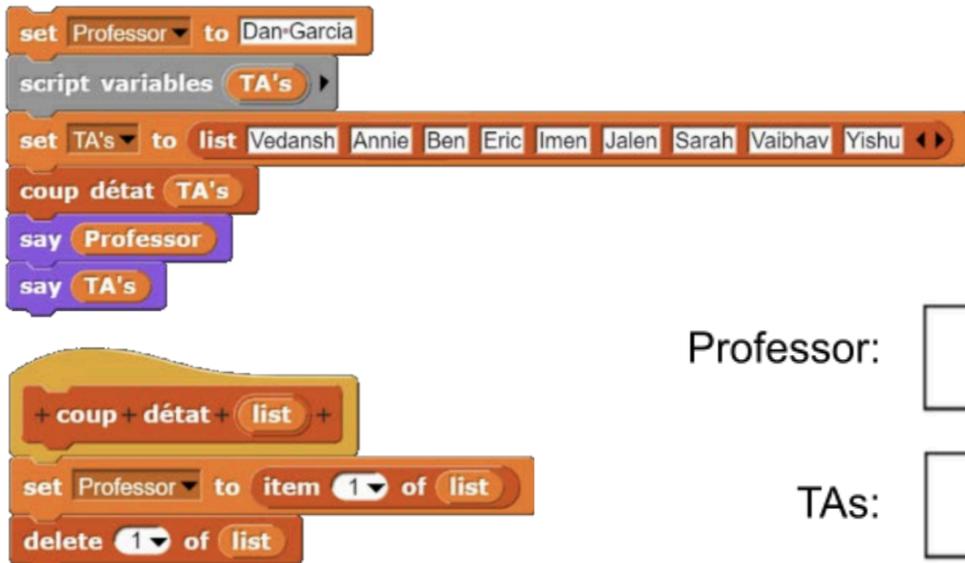
- 5. Using iteration, write a function that filters out the odd indices (only keep the even indices), and then doubles the value. This is how the function should behave:

```
filter out the even indices and double value list 1 2 3 4
```

1	4	-
2	8	-
length: 2		

Section II - Mutability vs. Immutability

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



The script consists of the following blocks:

- set `Professor` to `Dan-Garcia`
- script variables `TA's`
- set `TA's` to list `Vedansh Annie Ben Eric Imen Jalen Sarah Vaibhav Yishu`
- coup d'état `TA's`
- say `Professor`
- say `TA's`
- + coup d'état + list +
- set `Professor` to item `1` of list
- delete `1` of list

Output labels and boxes:

Professor:

TAs:

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



Script 2a blocks:

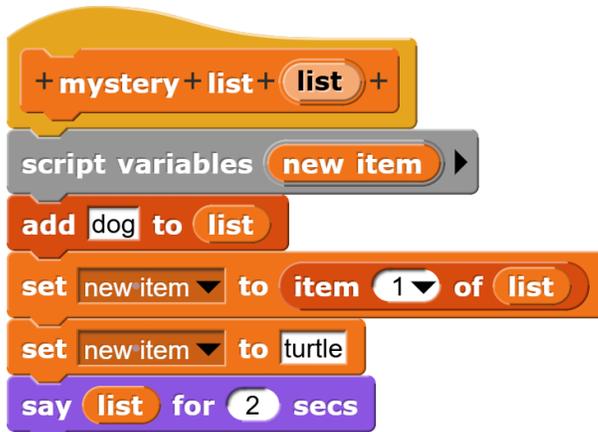
- script variables `a` `b`
- set `a` to list `1 2 3 4`
- set `b` to `a`
- replace item `1` of `b` with `cat`
- report `a`



Script 2b blocks:

- script variables `a` `b`
- set `a` to list `1 2 3 4`
- set `b` to `a`
- replace item `1` of `a` with `cat`
- report `b`

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



Script 3a blocks:

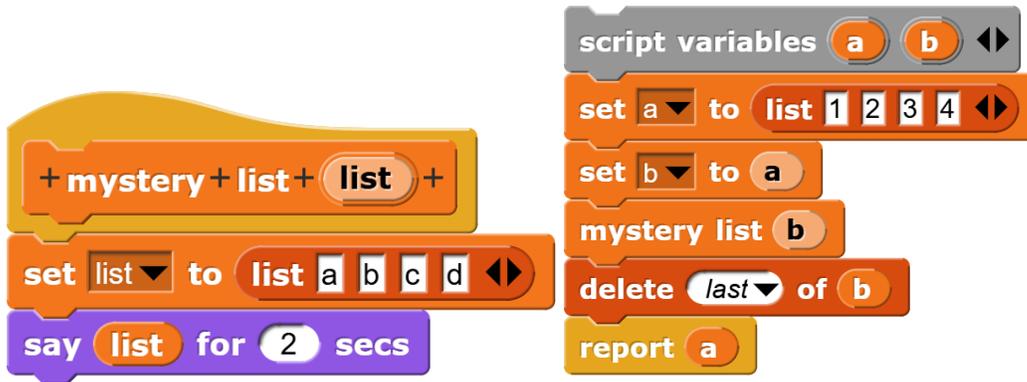
- + mystery + list + list +
- script variables `new item`
- add `dog` to `list`
- set `new item` to item `1` of `list`
- set `new item` to `turtle`
- say `list` for `2` secs



Script 3b blocks:

- script variables `a` `b`
- set `a` to list `1 2 3 4`
- set `b` to `a`
- mystery list `b`
- report `a`

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.

```
+ mutato + x + y +
script variables xy
set y to x
set x to y
set xy to list x y
report xy

set x to 61A
set y to A16
set yx to mutato x y
set xyz to item last of yx
set zyx to y
```

x : y : yx : xyz : zyx :

ERROR