



“You may also **like**”

Nested Loops

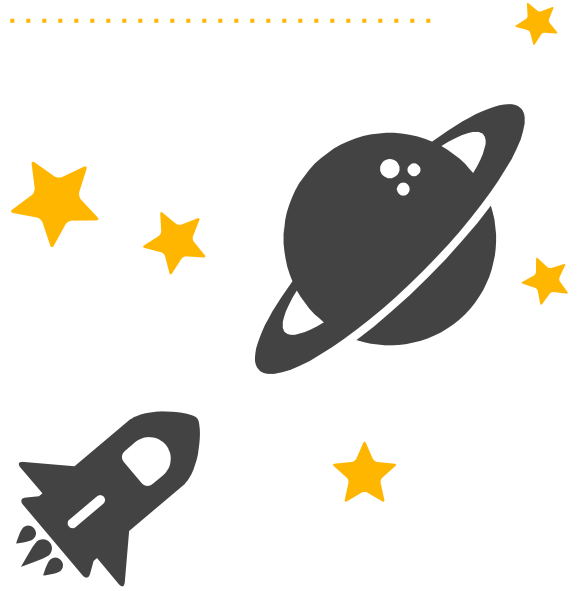
Midterm Content



- Content will be explicitly noted on the **Learning Outcomes** page.
- Things to review are **examples in class, practice quizzes, assignments, review questions, readings, exercises in readings**

Working with File Data

A loop inside a loop



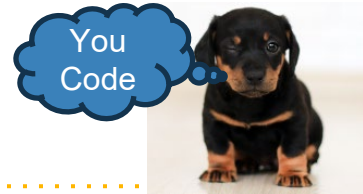


List Syntax check

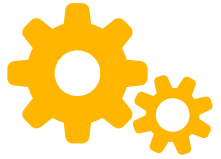
How do you create a list of the names of two of your friends?

How do you print the number of elements in a list? Do it for your friends list.

How do you add an element to a list? Do it for your friend's list to add one more friend at run-time.

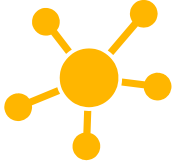


Find who likes same food as person with longest name



- Find person with longest name
 - Initialize variable to track longest name so far.
 - Search file for longer names
- Find names of people who like the same food as the person we previously found.
 - Get fav food of longest-name person.
 - Rescan the file looking at fav food of everyone
 - Return open file to beginning:
`my_file.seek(0)`
 - Add matching people's names to a list





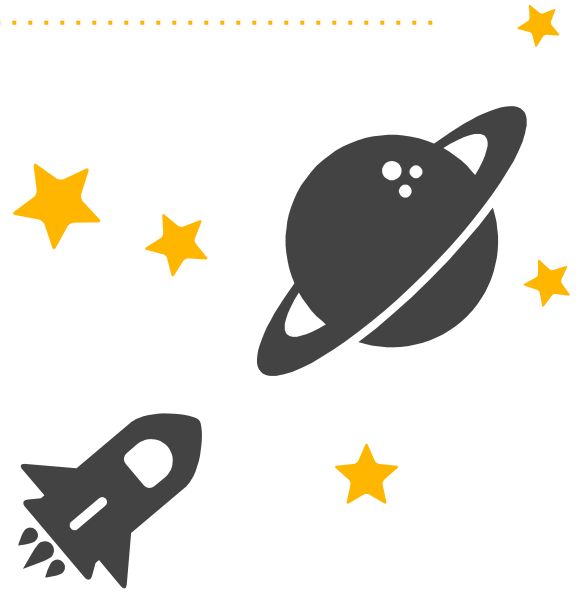
Let's **review** some concepts

What do you need to do to numeric input before performing calculations on it?

What will this code output?
`print(3 / 3)`

What function could you use to get the number of elements in a list?

Using Loops





Processing **lists with index**

```
listA = [10,20,30]
for elem in listA:
    print(elem)
```

```
listA = [10,20,30]
for i in range(len(listA)):
    print(listA[i])
```




Processing strings with index

```
letters = "abcd"
for char in letters:
    # process char
    print(char)
```

```
letters = "abcd"
for i in range(len(letters)):
    # process letters[i]
    print(letters[i])
```



Index of max element

Task: Print the index of maximum value in a list. If there multiple instances of this value in the list, output the index of the last one.

```
scores = [3, 8, 9, 8, 2, 9]
```





Index of max element

```
scores = [3, 8, 9, 8, 2, 9]
maxNum = scores[0]
maxIndex = 0

for i in range(len(scores)):
    if scores[i] >= maxNum:
        maxNum = scores[i]
        maxIndex = i
print("maximum", maxNum, "at index", maxIndex)
```

Multiple
ways to
solve a problem





Unique letters in strings

- Problem
 - Write a program which asks the user for an input word (or phrase).
 - Create a list of characters that appear exactly once.
- Algorithm
 - For each letter in the word:
 - Count how many times that letter appears.
 - If == 1, add it to list of letters





Duplicate letters in strings (bad)

- Problem
 - Write a program which asks the user for an input word (or phrase).
 - Find the list of characters that appear **more than once**
- Algorithm
 - For each letter in the word:
 - Count how many times that letter appears.
 - If > 1 , add it to list of letters

What happens for
“banana”?



Duplicate letters in strings (fixed)

- Problem
 - Write a program which asks the user for an input word (or phrase).
 - Find the list of characters that appear more than once
- Algorithm
 - For each letter in the word:
 - Count how many times that letter appears.
 - If > 1 , add it to list of letters **if it's not already there**

Let's
Code





Another Approach:

Duplicate letters in strings

- Problem
 - Write a program which asks the user for an input word.
 - Find the list of characters that are duplicated in the word.
- Algorithm:
 - For each letter in the word:
 - Does this letter appear **later in the word**?
 - If yes, add it to list of duplicate letters **if not already there.**





Another, Another Approach: Duplicate letters in strings

- Problem
 - Write a program which asks the user for an input word.
 - Find the list of characters that are duplicated in the word.
- Algorithm
 - Initialize an `already_seen` list of letters
 - For each letter in the word:
 - Is this letter in `already_seen`?
 - If yes, add it to list of duplicate letters **if not already there.**
 - If no, add it to `already_seen`.





Let's **review** some concepts

What does it mean to have a **nested** loop?

To find the person with a top score in a file, how many variables do you need to initialize? What data types?

How do you extend an existing list `num_list` to contain another element, let's say `4.0`?

How do you access the second to last element in a list called `favourites`?

How do you access the second to last and last elements in a list called `favourites`?

Who is the person most similar to you in the class (based on the survey)?