Dictionaries

CAC 180

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Class Today

- Dictionaries
- Practice

Remind me…

- What is a string?
- How do I reference the third character in a string?
- What is a list?
- How do I know how many elements are in a list?

Tuples

- Similar to a list but immutable (what does that mean again?)
- *variable_name = (val, val, val)*
- Examples:
  - Coordinates
  - RGB values of pixels

Why do these make sense as tuples?

Dictionaries

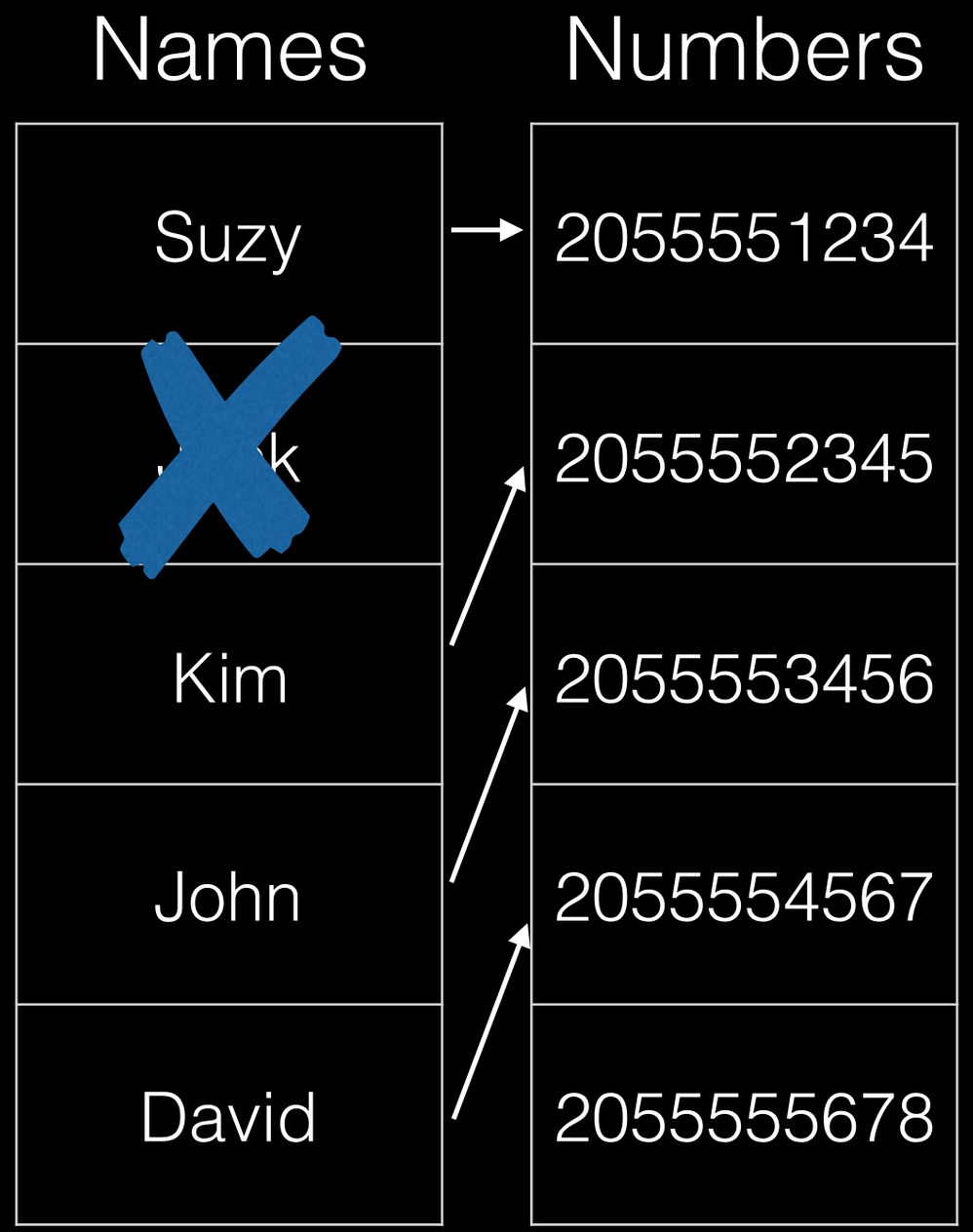
- How does the Oxford dictionary work?
- A dictionary in programming works the same way, there is a key and a value
- *dictionary_name = {key:value, key:value…}*

Example

- I have a list of contacts: names and numbers
- Why would it be a bad idea to store the contacts in two lists…one for names and one for numbers?
- What should the key be for a list of contacts?
- What should the value be?

Example Answers

- I have a list of contacts: names and numbers
- Why would it be a bad idea to store the contacts in two lists…one for names and one for numbers?
  - If you were to delete a name from the name list but forget to delete the associated number, the lists now do not match up.
- What should the key be for a list of contacts?
  - Name
- What should the value be?
  - Number



Creating the Dictionary

```
contacts={
‘Suzy’:’2055551234’,
‘Jack’:’2055552345’,
’Kim’:’2055553456’,
’John’:’2055554567’,
’David’:’2055555678’
}
```

Name	Number
Suzy	2055551234
Jack	2055552345
Kim	2055553456
John	2055554567
David	2055555678

Alternative Method - Helpful for Adding Entries

```
contacts = {}

contacts[‘Suzy’] = ’2055551234’
contacts[‘Jack’] = ’2055552345’
contacts[’Kim’] = ’2055553456’
contacts[’John’] = ’2055554567’
contacts[’David’] = ’2055555678’
```

Name	Number
Suzy	2055551234
Jack	2055552345
Kim	2055553456
John	2055554567
David	2055555678

Getting an Item from a Dictionary

- How do we get the phone number for one of our contacts?

- print(contacts[‘Suzy’])

- Dictionaries don’t work by position, they work by the key

- Dictionaries are actually hashmaps, can’t guarantee order

Updating an Entry

- contacts[‘Suzy’] = ‘2055559876’

Practice #1

- **Populate a dictionary with the following information (you're welcome to use your own information if you prefer).**
- **Print it to the screen.**
- **Allow the user to edit one player's total yards.**
- **Allow the user to ask for the total yards for one particular player and print as an whole number.**
- **Challenge: For the player above, print the difference between that player's total yards and the average total yards among the five quarterbacks.**
- **Total career passing yards:**
  - **Peyton Manning - 71940**
  - **Brett Favre - 71838**
  - **Drew Brees - 70445**
  - **Tom Brady - 66159**
  - **Dan Marino - 61361**

Practice #2

Morse code is an encoding scheme that uses dashes and dots to represent numbers and letters. In this exercise, you will write a program that uses a dictionary to store the mapping from letters and numbers to Morse code. Use a period to represent a dot, and a hyphen to represent a dash. The mapping from letters and numbers to dashes and dots is shown in the table below.

Your program should read a message from the user. Then it should translate each letter and number in the message to Morse code, leaving a space between each sequence of dashes and dots. Your program should ignore any characters that are not letters or numbers. The Morse code for Hello, World! is shown below:

.... . .-.. .-.. --- .-- --- .-. .-.. -..

Letter	Code	Letter	Code	Letter	Code	Number	Code
A	.-	J	.---	S	...	1	.----
B	-...	K	-.-	T	-	2	..---
C	-.-.	L	.-..	U	..-	3	...--
D	-..	M	--	V	...-	4	....-
E	.	N	-.	W	.--	5	.....
F	..-.	O	---	X	-..-	6	-....
G	--.	P	.--.	Y	-.--	7	--...
H	....	Q	--.-	Z	--..	8	---..
I	..	R	.-.	0	-----	9	----.