CSc 110
Dictionaries

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Looping

Looping through a dictionary

```
for key in dictionary:
    print(key)
```

- This will loop through each key in the dictionary
- Each time the loop iterated, key will be assigned to one of the keys
- No keys will be skipped

Looping

Looping through a dictionary

```
for key, value in dictionary.items():
    print(key)
    print(value)
```

- This will loop through each key+value pairs in the dictionary
- Each time the loop iterated, key and value will be assigned to one of the key+value pairs in dictionary

Looping

What will this print?

```
players = {"Lebron James":23, "Steph Curry":30, "Devin Booker":1}
for key, value in players.items():
    print(key + " wears " + str(value))
```

Activity

Find the odd one out

```
players = {"Lebron James":23, "Steph Curry":30, "Devin Booker":1}
```

```
for key, value in players.items():
    print(key + " wears " + str(value))
```

```
for value, key in players.items():
    print(key + " wears " + str(value))
```

```
for key in players :
    print(key + " wears " + str(players[key]))
```

Implement the function

- Implement a function named **count_st_addresses** that has one parameter, a dictionary mapping addresses to building names
- Should return the number of building whose addresses have **“St”** in it. For example:

```
addresses = {'1040 E 4th St Tucson AZ 85721':  'Gould Simpson Building',
             '10 W 34th St New York NY 10001': 'Empire State Building',
             '3400 E Sky Harbor Blvd Phoenix AZ 85034': 'Sky Harbor Airport'}

count = count_st_addresses(addresses)
print(count) # Should print 2
```

Implement the function

Activity

Implement a function named **buy_groceries** that has three parameters: a dictionary with stock quantities, a dictionary with prices, a dictionary with a shopping list

```
def buy_groceries(stock, prices, shopping_list):
    CODE HERE

def main():
  stock = {"banana": 10, "apple": 0, "orange": 32, "pear": 15}
  prices = {"banana": 2.00, "apple": 0.50, "orange": 1.50, "pear": 1.00}
  shopping_list = {"banana": 2, "apple": 2, "milk": 1}

  total = buy_groceries(stock, prices, shopping_list)
  print("total: $" + str(total))
```

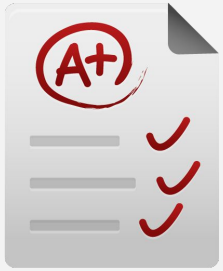
OUTPUT:

```
apple not available
milk not available
total: $4.0
```

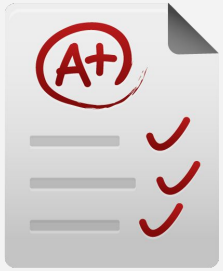
Let's build a quizzing program

- At the beginning of the program ask for:
  - The number of questions to give in the quiz (N)
  - a file to get questions/answers from

- The program will ask the user (N) questions, chosen from the questions from the input file.
  - Don't re-ask questions that user got correct.



what color does the sky appear (to most people)?|||blue
how many years did it take to build the panama canal?|||10
what is the term length in years for POTUS?|||4




```
what color does the sky appear (to most people)?|||blue
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what is the term length in years for POTUS?|||4
```
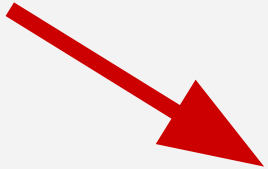
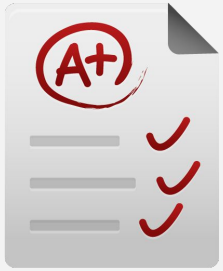
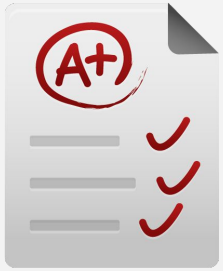



```
qa = { 'what color does the sky appear (to most people)?' : 'blue',
'how many years did it take to build the panama canal?' : '10',
'what is the term length in years for POTUS?' : '4' }
```

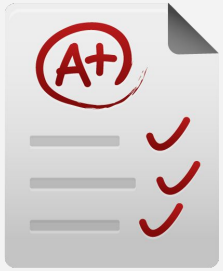


What are the names of the variables defined within the parentheses at a function definition?|||parameters
What data structure stores things in a sequence?|||list
True or False: Strings are immutable.|||True
What type can be used to store a number without decimals?|||int
The two types of loops we've covered are for loop and _____ loop.|||while
True or False: Every program should have a main function|||True
What symbols is used for string concatenation in python?|||+
What function can be used to get a string from a user in Python?|||input
true or false: you can have duplicate keys in a dictionary|||false
What symbols is used for multiplication in python?|||*

```
How many questions should be asked? 4
What is the name of the QA file? 110.txt
What symbols is used for string concatenation in python?
Enter response: +
correct!
What function can be used to get a string from a user in Python?
Enter response: input
correct!
true or false: you can have duplicate keys in a dictionary
Enter response: false
correct!
What symbols is used for multiplication in python?
Enter response: #
incorrect!
You got 3 out of 4 correct.
Your percentage grade: 75.0%
```



```
def load_questions_and_answers(file_name):
    # ?

def get_random_question(qa):
    # ?

def ask_question(qa):
    # ?

def main():
    # ?

main()
```



Implement load_questions_and_answers

```
def load_questions_and_answers(file_name):
    '''
    Load the questions and answers into a dictionary.

    file_name: the name of the file with the questions

    Steps:
        * Open the file
        * Create a dictionary to put the questions and answer in.
        * Add each question and answer pair into the qa dictionary.
        * return the dictionary
    '''
```

Implement `load_questions_and_answers`

```
def load_questions_and_answers(file_name):
    qa = {}
    file = open(file_name, 'r')
    for line in file:
        # ? ? ?
```

Implement `get_random_question`

```
def get_random_question(qa):
    '''
    Get a random question from the qa dictionary.
    qa: a dictionary, to load the questions and answers into.

    Steps:
        * Get the keys of the qa dictionary into a list
        * generate a random index
        * get one of the keys using the random index
        * return the question
    '''
```

get_random_question

```
def get_random_question(qa):
    keys = list(qa.keys())
    # ? ? ?
```

Implement ask_question

```
def ask_question(qa):
    ''' Ask a question to the user.
    Select a question from the qa dictionary at random.
    qa: a dictionary, to load the questions and answers into.
    Steps:
        * Get a random question from the data
        * Ask the question
        * Get user response
        * Handle correct/incorrect response
        * Return True if correct, False if incorrect
    '''
```

Implement ask_question

```
def ask_question(qa):
    question = get_random_question(qa)
    print(question)
    response = input('Enter response: ')
    # What next?
```

Implement `main`

```
def main():
    ''' Outline of main:
      * Ask the user for the two input values
        (num questions and question file)
      * Load content from the file into dictionary
      * Repeatedly ask the user a random question
          * Count the correct responses
      * Report the grade, numer correct, and total
      * Recall:
          def load_questions_and_answers(qa, file_name):
          def ask_question(qa):
    '''
```

Word Count (wc1.py)

- Write a program that:
  - Reads in a text file with words, one per line
  - Then, shows the counts
- Use a dictionary!

```
soccer 2
politics 1
belief 3
beef 1
America 2
```

words1.txt

```
basketball
soccer
politics
soccer
belief
beef
belief
America
belief
America
```

Activity

Word Count (wc1.py)

```
counts = {}
words_file = open('words1.txt', 'r')
for line in words_file:
    # What goes here?
```

words1.txt

```
basketball
soccer
politics
soccer
belief
beef
belief
America
belief
America
```

Word Count (wc1.py)

```
counts = {}
words_file = open('words1.txt', 'r')
for line in words_file:
    word = line.strip('\n')
    if word not in counts:
        counts[word] = 0
    counts[word] += 1

# How to print?
```

words1.txt

```
basketball
soccer
politics
soccer
belief
beef
belief
America
belief
America
```

Parties (parties.py)

- Write a program that:
  - Reads in a text file of people and their political party association
  - Prints the number of people in each party
- Use a dictionary!

parties1.txt

```
Joe Johnson D
Anne Weaver R
Jacob Cooper R
Diane Fassberg D
Gary Brown R
Xavier Paul R
```

```
R: 4
D: 2
```

parties2.txt

```
Alex Freemont R
Kramer Todd D
Westin Jones D
Arnold Jon D
Joe Jones R
```

```
R: 2
D: 3
```

Parties (parties.py)

```
parties = {}
words_file = open(... , 'r')
for line in words_file:
    # ?
    # ?
    # ?
    # ?

print('R:', parties['R'])
print('D:', parties['D'])
```

parties1.txt

```
Joe Johnson D
Anne Weaver R
Jacob Cooper R
Diane Fassberg D
Gary Brown R
Xavier Paul R
```

```
R: 4
D: 2
```

What would this program print?

```
parties = {'D':1452, 'R':2312, 'L':131}
numbers = [15, 105, 30, 700, 1500, 10]
for i in numbers:
    if i > 100:
        parties['L'] += i
largest_population = 0
for key in parties:
    if largest_population < parties[key]:
        largest_population = parties[key]
print(largest_population)
```