

Discussion 6

Control and Iteration

Materials: tinyurl.com/d8-disc06
or access through kevin-miao.com under teaching
Meme: Email me any fun Data Science memes!



Today

- Announcements
- Review: Control Flow and Iteration
- Worksheet
 - Link: www.tinyurl.com/d8-disc06

Announcements

- **Assignment deadlines**
 - **Vitamin 6** is due tonight
 - **Homework 5** is due Thursday
 - **Project 1** is due Friday
 - Submit homework & projects one day early for bonus point
- **Regrades** for homework 1 & 3 and lab 4 **due Friday**
 - Gradescope: Submit regrade via button
 - OkPy: Email me
- *Informal OH:* Feel free to stay after discussion, if you have homework/project/course related questions. I booked off time from 9-9:30 AM.

Conditionals

- **Objective:** We want to run different code depending on the value of a certain variable.
- **Example:** We want to know whether we need to wear a sweater based on the temperature
- **Usage:**

```
if temperature < 60:  
    print('Sweater weather')  
elif temperature < 70:  
    print('Only if you are from soCal🤨')  
else:  
    print('Nope!')
```

Iteration

- **Objective:** We want to do the same thing/call the same function for each item in a list/array

- **Usage:**

```
for book in ['book1', 'book2', 'book3']:  
    print(book)
```

- **Why are we learning this?** Later in the class we will be performing simulations of chance experiments (i.e. rolling a die 200 times)

```
x = 0
```

```
for i in np.arange(0,100):  
    x += 1
```

To the worksheet! ✍️

tinyurl.com/d8-disc06

Question 1

Question 1. What does the following function do? Fill out the docstring description for the function to include what the inputs should be and what the function does. *Hint: try to figure out what the function would do on different inputs.*

```
def mystery_function(n1, n2):  
    """  
    _____  
    if n2 - n1 > 0:  
        return n2 - n1  
    elif n2 - n1 < 0:  
        return n1 - n2  
    else:  
        return 0
```

Question 2

Question 2. The instructor of a lower division statistics class has assigned you a task: make a function that takes in a student's score on a scale from 0 to 100 and assigns a letter grade based on the following grade boundaries.

Score	Letter Grade
0-69	F
70-79	C
80-89	B
90-100+	A

Complete the function `compute_letter_grades`. It takes in a student's score and returns the letter grade they should receive.

```
def compute_letter_grades(score):  
    """  
    compute_letter_grades(10)  
    >>> "F"  
    compute_letter_grades(99)  
    >>> "A"  
    """  
    if _____:  
        return _____  
    elif _____:  
        return _____  
    elif _____:  
        return _____  
    else:  
        return _____
```


Question 3

Question 3. Skeleton code for the function `count_evens` is below. The function takes in an array of numbers and returns the number of even numbers in the array.

a. If a number n is odd, what will $n\%2$ return?

b. Use a combination of iteration and conditionals to complete the function below.

Hint: the `%` operator returns the remainder if you divide by a certain number! Example: $11 \% 5 = 1$

```
def count_evens(n_array):  
    num_evens = _____  
    |  
    for _____:  
        if _____:  
            _____  
  
    return _____
```

Question 3

c. Use array operations to complete the function below.

```
def count_evens(n_array):  
    remainder_array = _____  
    return _____
```

Question 4

Question 4. Complete the function `separate_numbers`, which takes in an array of numbers and a boolean value. It should return the number of even values in the array if the argument `return_even` is `True`, or the number of odd values in the array if `return_even` is `False`.

Hint: Use the `count_evens` function you defined above!

```
def separate_numbers(n_array, return_even):  
    num_evens = _____  
    if _____:  
        return _____  
    else:  
        return _____
```

End of Section

How did I do?

<https://tinyurl.com/kevind8feedback>