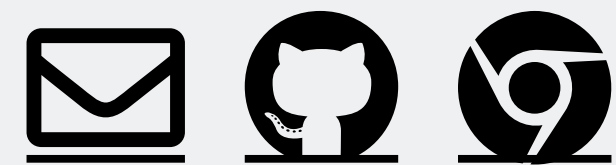

LG 467 Computers in Linguistics

[1-2021] Python 3: Control & Conditions

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Recap

Previously...

Strings and string methods

```
# Here's the first line of Star Spangled Banner
st1 = "O say can you see, by the dawn's early light"

st1.split()
st1.split(',')
st1.lower().replace('see', 'saw')
st1.replace('?', '') #nothing changes
st1.count('say')
st1.capitalize()
st1.upper()
st1.title() #a new trick here!
```

Code 2.1

Previously...

Python's built-in functions

```
len(st1)      #count everything including spaces
len(st1.replace(' ', ''))
len(st1.split())

n = int(input("Enter any number:"))
print("Your magic number today is:", (n*2)**3)

# What's gonna happen here?
n = input("Enter any number: ")
print("Your magic number today is:", (n*2)**3)
```

Code 2.2

Casting: Turning what you get from `input()` into a type you want

Exercise 1

A sample answer

Let's crack #12 together. First, we'll need to think about:

INPUT: What do we need from users? (Height and weight)
 In what types? (Integer [int])
 (Floating num. [float])

OUTPUT: An answer in English
 Some value of BMI

A sample answer

Let's get some input from users and cast it:

```
wg = int(input("Enter your weight in kilograms: "))  
ht = float(input("Enter your height in meters such as  
1.76, 1.83, 1.90: "))
```

Code 2.3

A sample answer

Then, calculate a body mass index value:

```
wg = int(input("Enter your weight in kilograms: "))
ht = float(input("Enter your height in meters such as
1.76, 1.83, 1.90: "))

bmi = wg / (ht ** 2)
bmi = round(bmi, 2)
```

Code 2.3
[Continued]

A sample answer

Finally, print out an extremely mean message:

```
wg = int(input("Enter your weight in kilograms: "))
ht = float(input("Enter your height in meters such as
1.76, 1.83, 1.90: "))

bmi = wg / (ht ** 2)
bmi = round(bmi, 2)

if bmi >= 25:
    print("Your BMI is: " + str(bmi) + ". " +
          "You're overweight.")
else:
    print("Your BMI is: " + str(bmi) + ". " +
          "You're healthy!")
```

Code 2.3
[Continued]

Aside: Sequence of code

Python code is executed from top to bottom

```
# Restart: What's going to happen here?  
bmi = round(wg / (ht ** 2), 2)  
  
wg = int(input("Enter your weight in kilograms: "))  
ht = float(input("Enter your height in meters such as  
1.76, 1.83, 1.90: "))
```

Code 2.4

See more examples in the accompanying code.

Control & Conditions

if, else, elif

Sometimes, we may want to execute part of code when a certain condition is met: For example,

- If the first alphabet is a vowel, add "an";
- If a tweet is over 280 characters long, warn the user;
- If a song contains swear words, print out those words....

These are all decisions. How can computers make decisions if they can't think?

if, elif, else

Here's what a control if statement looks like:

```
if <condition>:  
    <expression>  
    <expression>  
    .....
```

```
if <condition>:  
    <expression>  
    <expression>  
    .....  
else:  
    <expression>  
    <expression>  
    .....
```

```
if <condition>:  
    <expression>  
    .....  
elif <condition>:  
    <expression>  
    .....  
else:  
    <expression>  
    .....
```

if, elif, else: Indentation

Indentation determines how the `if` and `else` sections are paired

```
weight = int(input("Enter your weight in kilograms: "))
age = int(input("Enter your age: "))

# Notice the colon
if weight >= age:
    print("You're growing too fast.")
else:
    print("You're growing too slowly.")
```

Code 2.5

Recommended style (PEP-8): four spaces (Spyder does this for you!)

if, elif, else: Indentation

Indentation determines how the `if` and `else` sections are paired

```
sent = input("Type any sentence: ")
s = sent.split()

if len(s) % 2 == 0:
    if len(s[0]) % 2 == 0:
        print("Everything is perfect")
    else:
        print("Good! The 1st word has", len(s[0]), "characters.")
else:
    if len(s[0]) % 2 == 0:
        print("Okay! The 1st word has", len(s[0]), "characters.")
    else:
        print("Well, better luck next time!")
```

Code 2.6

if, elif, else

You can test multiple conditions by adding 1+ e l i f

```
#1+ elif (short for else if) is possible
x = 12
y = int(input("Enter a number: "))

if x < y:
    print("Not bad. Just", abs(x - y), "points apart.")
elif x > y:
    print("Close! Just", abs(x - y), "points apart.")
else:
    print("Awesome!")
```

Code 2.7

Conditions: Comparison

You might be confused about what is going on inside <condition>

```
if <condition>:  
    <expression>  
    <expression>  
    .....
```

```
if <condition>:  
    <expression>  
    <expression>  
    .....  
else:  
    <expression>  
    <expression>  
    .....
```

```
if <condition>:  
    <expression>  
    .....  
elif <condition>:  
    <expression>  
    .....  
else:  
    <expression>  
    .....
```

Conditions: Comparison

Inside <condition>, we test if a condition is met (NOTE: ==)

```
# Comparison operators return True or False
5 > 3
5 < 3
5 >= 3
5 <= 3
5 == 3
5 != 3

# Which type is it?
type(5 > 3)

# What's going to happen?
'a' < 2
```

Code 2.8

Conditions: Comparison

Inside <condition>, we test if a condition is met

```
# Going beyond:
s1 = input("Give me one sentence: ")
s2 = s1.replace(' ', '').strip('!.?')
s3 = input("Give me another sentence: ")
s4 = s3.replace(' ', '').strip('!.?')

len(s2) == len(s4)
len(s2) % 2 == 0
len(s4) % 2 != 0
```

Code 2.8
[Continued]

Conditions: Comparison

Inside <condition>, we test if a condition is met

```
# For multiple comparison
x = 10
y = 19

x < 20 and y > 20
x < 20 and not y > 20
x < 20 or y > 20
5 < x < 15

# and or not are reserved words
```

Code 2.8
[Continued]

Conditions: Comparison

Now, let's get back to our previous code:

```
weight = int(input("Enter your weight in kilograms: "))
age = int(input("Enter your age: "))

# Notice the colon
if weight >= age:
    print("You're growing too fast.")
else:
    print("You're growing too slowly.")
```

Code 2.5

Can you tell me what's going to happen inside <condition>?

Exercise 2

Palindrome

A palindrome is a sequence of characters (words, numbers, phrases) which reads the same backward as forward:

- kayak
- wow
- tenet
- top spot
- my gym
- บี้บ
- กาก
- นอน
- ยาย
- กอดอก

Palindrome

How can we check if something is a palindrome? Recall:

```
# Slicing strings
st = "iphone"
st[0]
st[1:]
st[3:-1]
st[::-1]
```

Code 2.9

Now that we have a reverse, what's next?

Palindrome

Here's what we need to make a palindrome checker (palindrome.py)

#1: Get an English word or phrase from users

#2: If word length is less than 2, tell users it's too short

#3: If word length > 2, get a reverse

#3.1: Check if word is same as reverse. If true, say it's a palindrome. If false, say it is not a palindrome.

Palindrome

Once you get a hang of this, address the following issues:

- #1: "Level" is a palindrome (HINT: lowercase)
- #2: "My gym" is a palindrome (HINT: spaces)
- #3: "Madam, I'm Adam." is a palindrome (HINT: , ' . ! ?)

Follow the steps outlined in the Exercise2.py script.

Palindrome

The program should work like this:

```
In [1]: runfile('/Users/Sakol/Desktop/LG467/Exercise2-key.py', wdir='/Users/Sakol/Desktop/LG467')
Type in your word: racecar
The word "racecar" is a palindrome.

In [2]: runfile('/Users/Sakol/Desktop/LG467/Exercise2-key.py', wdir='/Users/Sakol/Desktop/LG467')
Type in your word: My gym
The word "My gym" is a palindrome.

In [3]: runfile('/Users/Sakol/Desktop/LG467/Exercise2-key.py', wdir='/Users/Sakol/Desktop/LG467')
Type in your word: lemon
The word "lemon" is not a palindrome.

In [4]: runfile('/Users/Sakol/Desktop/LG467/Exercise2-key.py', wdir='/Users/Sakol/Desktop/LG467')
Type in your word: Madam, I'm Adam.
The word "Madam, I'm Adam." is a palindrome.

In [5]: runfile('/Users/Sakol/Desktop/LG467/Exercise2-key.py', wdir='/Users/Sakol/Desktop/LG467')
Type in your word: aa
Sorry, it is too short! Use a different word.
```