IE 345 - K “Introduction to Deep Learning: Fundamentals Concepts”

Prof. Yuzo

INTRODUCTION TO PYTHON FOR DATA ANALYSIS

In [1]:
```
suma = 0
for num in range (1, 101):
    suma += num
print(suma)
```

```
5050
```

In [2]:
```
for num in range (1, 10):
    if num%2 == 0:
        print('Even')
    else:
        print('Odd')
```

```
Odd
Even
Odd
Even
Odd
Even
Odd
Even
Odd
```

In [3]:
```
even_list = []
for num in range(1, 10):
    if num%2 == 0:
        print('Even')
        even_list.append(num)
    else:
        print('Odd')
print(even_list)
print('Counting even numbers: ')
print(len(even_list))
```

```
Odd
Even
Odd
Even
Odd
Even
Odd
Even
Odd
[2, 4, 6, 8]
Counting even numbers:
4
```

Simple Operations Including Maths

In [4]:
```
3 + 4
```

Out[4]: 7

In [5]:
```
3 * 4
```

Out[5]: 12

In [6]:
```
12 / 3
```

Out[6]: 4.0

In [7]:
```
12%3
```

Out[7]: 0

In [8]:
```
12%7
```

Out[8]: 5

In [9]:
```
2**3
```

Out[9]: 8

In [10]:
```
2*3+4
```

Out[10]: 10

In [11]:
```
4+2*3
```

Out[11]: 10

In [12]:
```
(4+2)*3
```

Out[12]: 18

In [13]:
```
str(4) + "I am awesome"
```

Out[13]: '4I am awesome'

In [14]:
```
3.0 + 3.0
```

Out[14]: 6.0

In [15]:
```
float(3) + 3.0
```

Out[15]: 6.0

In [16]:
```
import numpy as np
from scipy import stats
```

In [17]:
```
'I think'
"I think"
```

Out[17]: 'I think'

In [18]:
```
"She said, 'I am the best'"
```

Out[18]: "She said, 'I am the best'"

In [19]:
```
'She said, "I am the best"'
```

Out[19]: 'She said, "I am the best"'

In [20]:
```
'I am' + 'awesome'
```

Out[20]: 'I amawesome'

In [21]:
```
'I am' + ' awesome'
```

Out[21]: 'I am awesome'

In [22]:
```
4 * 'Pyhton '
```

Out[22]: 'Pyhton Pyhton Pyhton Pyhton '

In [23]:
```
5 * 'math '
```

Out[23]: 'math math math math math '

In [24]:
```
3**2
```

Out[24]: 9

In [25]:
```
3 % 2
```

Out[25]: 1

In [26]:
```
3/2
```

Out[26]: 1.5

In [27]:
```
'I am number ' + '9'
```

Out[27]: 'I am number 9'

In [28]:
```
'I am number '+ str(9)
```

Out[28]: 'I am number 9'

Print Statements

In [29]:
```
print('This is Python Level Two')
```

```
This is Python Level Two
```

In [30]:
```
print(3*3)
```

```
9
```

In [31]:
```
print(3)
```

```
3
```

In [32]:
```
print('I am number ' + str(9))
```

```
I am number 9
```

In [33]:
```
x = 9
x
```

Out[33]: 9

In [34]:
```
myname = 'Thon'
myname
```

Out[34]: 'Thon'

In [35]:
```
mylanguage = 'Python'
mylanguage
```

Out[35]: 'Python'

In [36]:
```
print(mylanguage)
```

```
Python
```

In [37]:
```
x = 3
```

In [38]:
```
y = 4
```

In [39]:
```
x + y
```

Out[39]: 7

In [40]:
```
x * y
```

Out[40]: 12

In [41]:
```
y % x
```

Out[41]: 1

In [42]:
```
x * 3
```

Out[42]: 9

In [43]:
```
x + 9
```

Out[43]: 12

In [44]:
```
y * 3
```

Out[44]: 12

In [45]:
```
x + y + 3
```

Out[45]: 10

In [46]:
```
x * 'Python '
```

Out[46]: 'Python Python Python '

In [47]:
```
x = 3
x
```

Out[47]: 3

In [48]:
```
x = 9
x
```

Out[48]: 9

In [49]:
```
x = x + 1
x
```

Out[49]: 10

In [50]:
```
x = 9
```

In [51]:
```
x += 1
x
```

Out[51]: 10

In [52]:
```
firstfood = 'eggs'
```

In [53]:
```
secondfood = 'ham'
```

In [54]:
```
thirdfood = 'bread'
```

In [55]:
```
firstfood + secondfood + thirdfood
```

Out[55]: 'eggshambread'

Creating your first program

In [56]:
```
x = 3
y = 9
print(x + y)
```

```
12
```

In [57]:
```
firstname = 'Py'
lastname = 'Thon'
multiplier = 2 * 3
print(multiplier * (firstname + lastname))
```

```
PyThonPyThonPyThonPyThonPyThonPyThon
```

In [58]:
```
myname = 'Thon'
age = 25
hobby = 'programming'
print('Hi, my name is '+ myname + ' and my age is '+ str(age) + '. Anyway, my hobby is '+hobby+ '.')
```

```
Hi, my name is Thon and my age is 25. Anyway, my hobby is programming.
```

Asking the User for an Input

In [59]:
```
print('What is your name ?')
myName = input()
print('Your name is ' + myName)
```

```
What is your name ?
Juan
Your name is Juan
```

In [60]:
```
print('How old are you ?')
myAge = input()
print('My name is '+myName+' and I am '+myAge+' years old.')
```

```
How old are you ?
27
My name is Juan and I am 27 years old.
```

Python Level Three

In [61]:
```
8 == 8
```

Out[61]: True

In [62]:
```
8 > 4
```

Out[62]: True

In [63]:
```
8 < 4
```

Out[63]: False

In [64]:
```
8 != 4
```

Out[64]: True

In [65]:
```
8 != 8
```

Out[65]: False

In [66]:
```
8 >= 2
```

Out[66]: True

In [67]:
```
8 <= 2
```

Out[67]: False

In [68]:
```
'hello' == 'hello'
```

Out[68]: True

In [69]:
```
'cat' != 'dog'
```

Out[69]: True

Boolean Operators (and, or, not)

In [70]:
```
8 > 3 and 8 > 4
```

Out[70]: True

In [71]:
```
8 > 3 and 8 > 9
```

Out[71]: False

In [72]:
```
8 > 9 and 8 > 10
```

Out[72]: False

In [73]:
```
8 > 3 or 8 > 800
```

Out[73]: True

In [74]:
```
'hello' == 'hello' or 'cat' == 'dog'
```

Out[74]: True

In [75]:
```
not True
```

Out[75]: False

In [76]:
```
not False
```

Out[76]: True

In [77]:
```
not 8 > 1
```

Out[77]: False

In [78]:
```
not 8 > 800
```

Out[78]: True

If, Elif and Else Statements

In [79]:
```
myNumber = input()
if int(myNumber) > 100:
    print('The number is greater than 100.')
else:
    print('The number is just less than 100.')
```

```
75
The number is just less than 100.
```

In [80]:
```
savedPassword = 'adm1234'
print('What´s your email ? ')
myEmail = input()
print('Type in your password.')
typedPassword = input()
if typedPassword == savedPassword:
    print('Congratulations! You´re now logged in.')
else:
    print('Your password is incorrect. Please try again.')
```

```
What´s ypur email ?
pablodavid218@gmail.com
Type in your password.
adm1234
Congratulations! You´re now logged in.
```

In [81]:
```
print('What´s the temperature in your room at night (in Celsius)? ')
roomTemp = int(input())
if roomTemp <= 20 and roomTemp >=15:
    print('Nice. It´s easy to fall asleep if that´s your room´s temperature.')
else:
    print('Perhaps it´s too cold or too hot. Not ideal.')
```

```
What´s the temperature in your room at night (in Celsius)?
25
Perhaps it´s too cold or too hot. Not ideal.
```

While Loops

In [82]:
```
inbox = 0
while inbox < 10:
    print('You have a message.')
    inbox = inbox + 1
```

```
You have a message.
You have a message.
You have a message.
You have a message.
You have a message.
You have a message.
You have a message.
You have a message.
You have a message.
You have a message.
```

In [83]:
```
inbox = 0
while inbox < 10:
    print(str(inbox)+' You have a message.')
    inbox = inbox + 1
```

```
0 You have a message.
1 You have a message.
2 You have a message.
3 You have a message.
4 You have a message.
5 You have a message.
6 You have a message.
7 You have a message.
8 You have a message.
9 You have a message.
```

In [84]:
```
name = ' '
while name != 'Casanova':
    print('PLease type your name.')
    name = input()
print('Congratulations!')
```

```
PLease type your name.
Pedro
PLease type your name.
juan
PLease type your name.
Casanova
Congratulations!
```

For Loops

In [85]:
```
for i in range(10):
    print(i ** 2)
```

```
0
1
4
9
16
25
36
49
64
81
```

In [86]:
```
total = 0
for num in range(101):
    total = total + num
print(total)
```

```
5050
```

In [87]:
```
all_reviews = [5, 5, 4, 4, 5, 3, 2, 5, 3, 2, 5, 4, 3, 1, 1, 2, 3, 5, 5]
positve_reviews = []
for i in all_reviews:
    if i > 3:
        print('Pass')
        positve_reviews.append(i)
    else:
        print('Fall')
print(positve_reviews)
print(len(positve_reviews))
ratio_positive = len(positve_reviews) / len(all_reviews)
print('Percentage of positive reviews: ')
print(ratio_positive * 100)
```

```
Pass
Pass
Pass
Pass
Pass
Fall
Fall
Pass
Fall
Fall
Pass
Pass
Fall
Fall
Fall
Fall
Fall
Pass
Pass
[5, 5, 4, 4, 5, 5, 5, 4, 5, 5]
10
Percentage of positive reviews:
52.63157894736842
```

Summary and Review

Evaluate if True or False

In [88]:
```
5 == 5 and 6 != 5
```

Out[88]: True

In [89]:
```
2 == 2 or 3 > 5
```

Out[89]: True

In [90]:
```
5 >= 5 or 6 > 1
```

Out[90]:
```
True
```

Predict the output or result of this block of code

In [91]:
```
the_list = []
for i in range(0, 11):
    the_list.append(i)
print(the_list)
```

```
[0, 1, 2, 3, 4, 5, 6, 7, 8, 9, 10]
```

In [92]:
```
div_three = []
for i in range(1, 50):
    if i%3 == 0:
        div_three.append(i)
print(div_three)
```

```
[3, 6, 9, 12, 15, 18, 21, 24, 27, 30, 33, 36, 39, 42, 45, 48]
```

Python Level Four

In [93]:
```
def hello():
    print('Hello world!')

hello()
```

```
Hello world!
```

In [94]:
```
def hi_name(name):
    print('Hi '+ name)

hi_name('Aardvark')
```

```
Hi Aardvark
```

In [95]:
```
def add_numbers(a, b):
    print(a + b)

add_numbers(5, 10)
add_numbers(35, 55)
```

```
15
90
```

In [96]:
```
def square_number(num):
    print(num**2)

square_number(50)
square_number(9)
```

```
2500
81
```

In [97]:
```
def even_check(num):
    if num % 2 == 0:
        print('Number is even.')
    else:
        print('Hmm, it is odd.')

even_check(50)
even_check(51)
```

```
Number is even.
Hmm, it is odd.
```

Scope(Global & Local Variables)

In [98]:
```
x = 25
def printer():
    x = 50
    return x

print(x)
print(printer())
```

```
25
50
```

Handling Errors & Exceptions

In [99]:
```
def spam(divideBy):
    try:
        return 42 / divideBy
    except ZeroDivisionError:
        print('Error: Invalid argument.')

print(spam(2))
print(spam(12))
print(spam(0))
print(spam(1))
```

```
21.0
3.5
Error: Invalid argument.
None
42.0
```

More Examples & Exercises

In [100]:
```
def sum_three(a, b, c):
    print(a + b + c)

sum_three(3, 4, 5)
```

```
12
```

In [101]:
```
def div_three(num):
    if num % 3 == 0:
        print('This is divisible by three.')
    else:
        print('Hmm, nope.')

div_three(3)
div_three(5)
div_three(9)
div_three(1013854)
```

```
This is divisible by three.
Hmm, nope.
This is divisible by three.
Hmm, nope.
```

In [102]:
```
while True:
    try:
        x = int(input("Please enter a number: "))
        break
    except ValueError:
        print("Oops! That was no valid number. Try again...")
```

```
Please enter a number: cuatro
Oops! That was no valid number. Try again...
Please enter a number: 85
```

Python Level Five

Creating a List

In [103]:
```
my_list = ['eggs', 'ham', 'bacon']
colours = ['red', 'green', 'blue']
cousin_ages = [33, 35, 42]
mixed_list = [3.14, 'circle', 'eggs', 500]
```

In [104]:
```
colours[0]
```

Out[104]:
```
'red'
```

In [105]:
```
colours[1]
```

Out[105]:
```
'green'
```

Slicing the List

In [106]:
```
my_list = [0, 1, 2, 3, 4, 5, 6, 7, 8, 9]
print(my_list[0:2])
print(my_list[1:])
print(my_list[3:6])
```

```
[0, 1]
[1, 2, 3, 4, 5, 6, 7, 8, 9]
[3, 4, 5]
```

In [107]:
```
len(my_list)
```

Out[107]:
```
10
```

Changing the Values

In [108]:
```
colours[0] = 'yellow'
print(colours)
```

```
['yellow', 'green', 'blue']
```

In [109]:
```
colours[1] = 'purple'
colours[2] = 'magenta'
print(colours)
```

```
['yellow', 'purple', 'magenta']
```

List Operations (Concatenation, Append)

In [110]:
```
colours = ['red', 'green', 'blue']
colours.append('pink')
print(colours)
```

```
['red', 'green', 'blue', 'pink']
```

In [111]:
```
even_list = []
for num in range(1, 10):
    if num%2 == 0:
        print('Even')
        even_list.append(num)
    else:
        print('Odd')

print(even_list)
print('Counting even numbers: ')
print(len(even_list))
```

```
Odd
Even
Odd
Even
Odd
Even
Odd
Even
Odd
[2, 4, 6, 8]
Counting even numbers:
4
```

In [112]:
```
fave_series = ['GOT', 'TWD', 'WW']
fave_movies = ['HP', 'LOTR', 'SW']
fave_all = fave_series + fave_movies
print(fave_all)
```

```
['GOT', 'TWD', 'WW', 'HP', 'LOTR', 'SW']
```

In [113]:
```
level_one = ['shell', 'math', 'data-types']
level_two = ['print', 'variables', 'input']
two_levels = level_one[0:2] + level_two[1:]
print(two_levels)
```

```
['shell', 'math', 'variables', 'input']
```

Pablo David Minango Negrete

$pablodavid218@gmail.com$

Lisber Arana Hinostroza

$lisberarana@gmail.com$