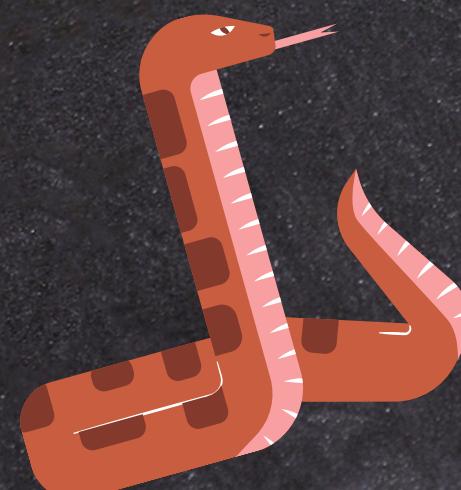


Python Programming

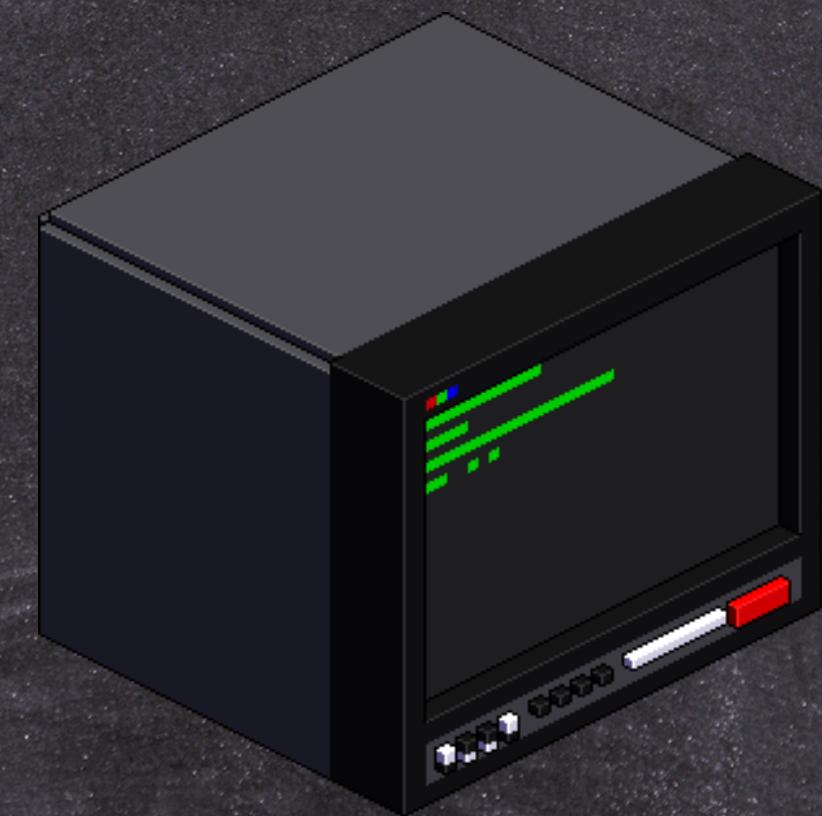
A brief of the content!





Terminal

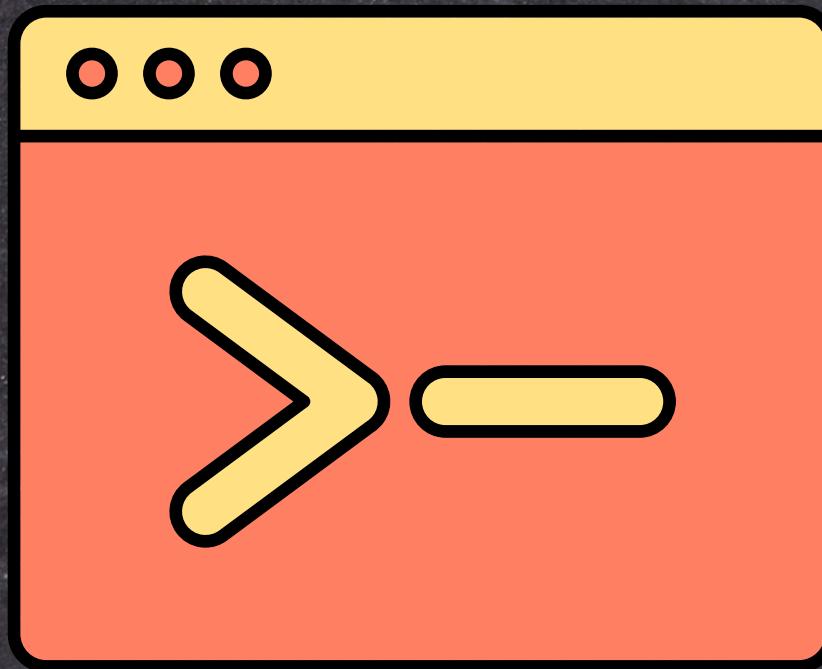
In computing, a terminal is a program that allows you to interact with your computer's operating system through a command-line interface. It provides a text-based interface for executing commands and running programs.





To open the terminal in Windows, you can follow these steps:

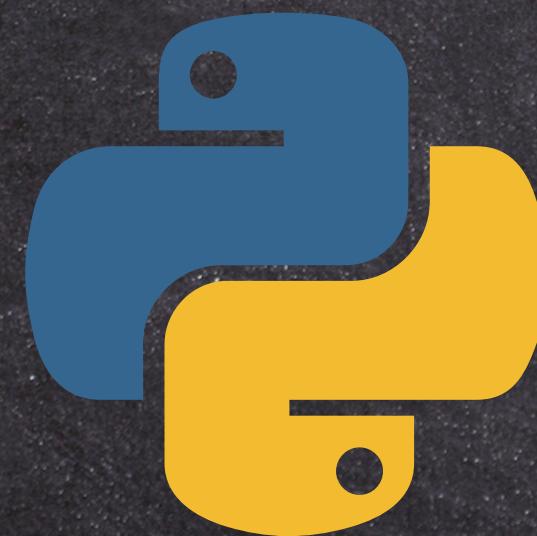
1. Click on the "Start" button in the bottom left corner of your screen.
2. Type "cmd" in the search bar and press Enter. This will open the Command Prompt, which is a basic terminal program that comes with Windows.





Python

Python is a popular programming language that can be used to write a wide variety of software applications. When working with Python, you can use the terminal to run Python scripts and execute Python commands. This allows you to interact with your Python code and see the output of your programs in real-time.

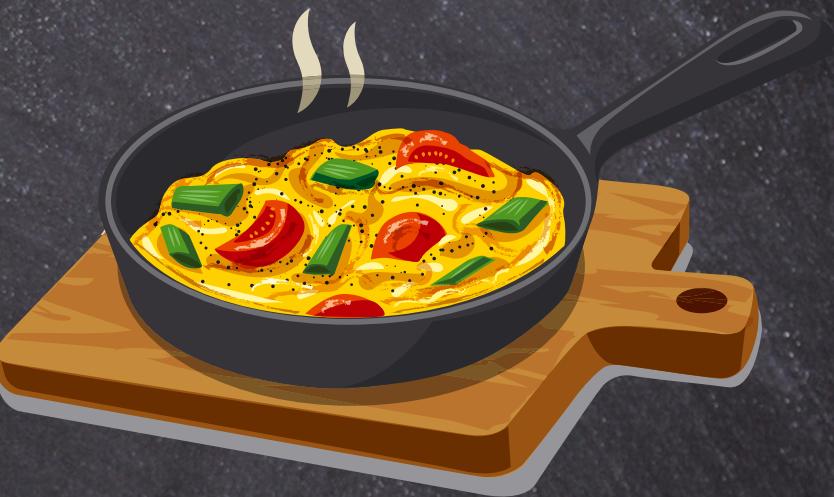




Some algorithms

- **making a Persian-style omelette**

1. Check that you have all necessary ingredients: eggs, tomatoes, onion, salt, pepper, turmeric, and oil.
2. Get a frying pan out of the cabinet and place it on the stove.
3. Pour enough oil into the pan to coat the bottom and heat it over medium heat.
4. While the oil is heating up, dice the tomatoes and onions into small pieces.
5. Once the oil is hot, add the onions to the pan and cook until they become translucent.
6. Add the tomatoes to the pan and cook until they become soft and start to release their juices.
7. Season the mixture with salt, pepper, and a generous amount of turmeric.
8. In a separate bowl, beat the eggs until they are well mixed.
9. Pour the beaten eggs into the pan over the tomato and onion mixture.
10. Cook the omelette over medium-low heat until the eggs are set and the bottom is golden brown.
11. Carefully flip the omelette over and cook the other side until it is golden brown.
12. Slide the omelette onto a plate and enjoy your delicious Persian-style omelette!
13. Turn off the stove and let the pan cool down before washing it.
14. Store any remaining ingredients back in the cabinet and fridge.





Some algorithms

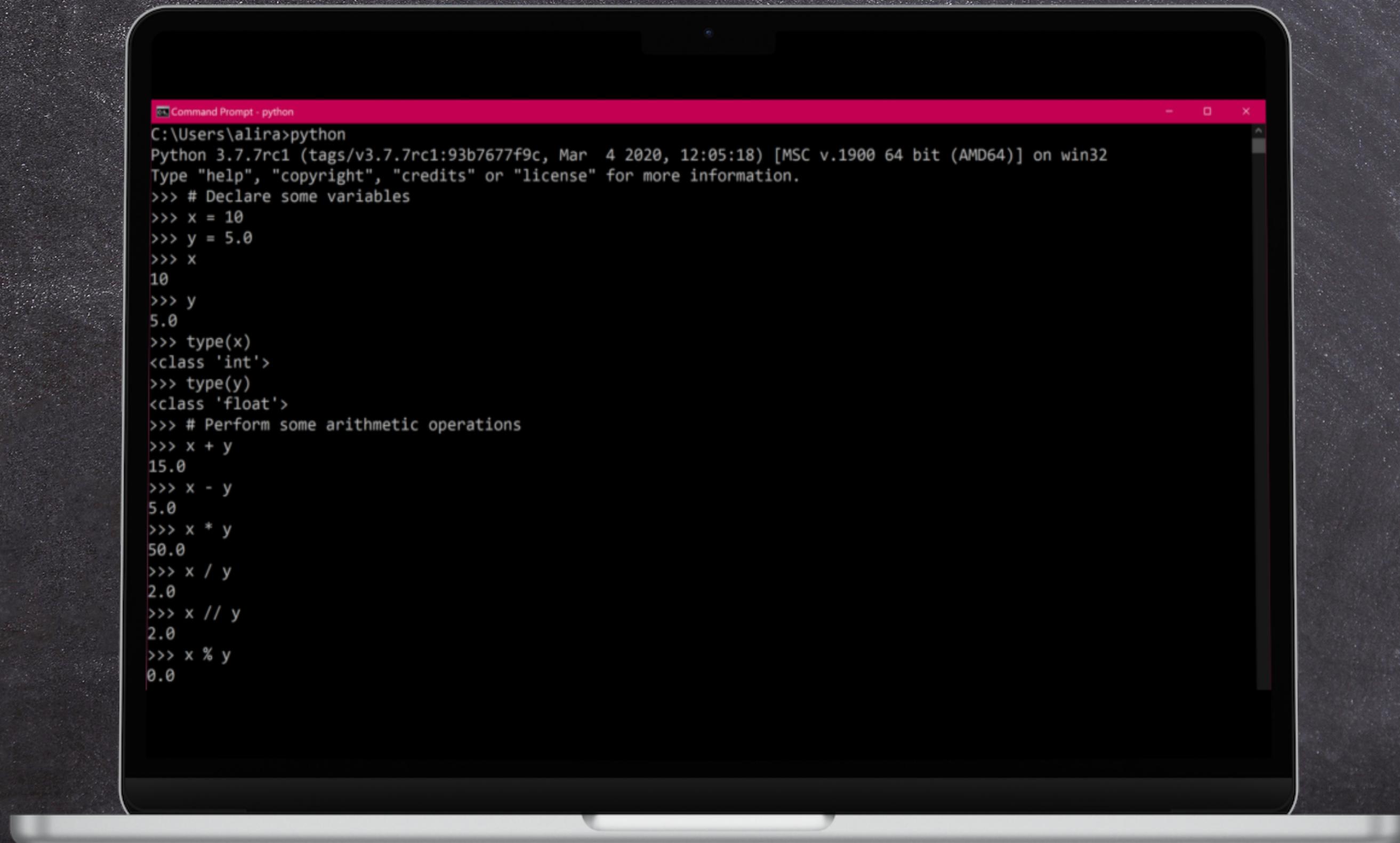
- **Algorithm for hair styling with a comb**

1. Determine the desired hairstyle and any necessary styling products.
2. Gather all necessary equipment: a comb or brush, hair tie, and any styling products you wish to use.
3. Starting from the top of your head, use the comb to section off the hair into manageable sections.
4. Comb each section of hair to smooth out any tangles or knots.
5. Use the comb to create the desired shape and volume, directing the hair in the desired direction.
6. If using styling products, apply them as needed to hold the hair in place or provide texture.
7. Repeat steps 3-6 for each section of hair until the entire head of hair has been styled.
8. If necessary, use a hair tie or other accessory to secure any sections of hair that need to be held in place.
9. Check the hair for any stray strands or uneven areas, and use the comb to make any necessary adjustments.
10. Finish by applying any final touches, such as hairspray or shine serum, to complete the hairstyle.





Working with variables and some simple operators in the terminal:



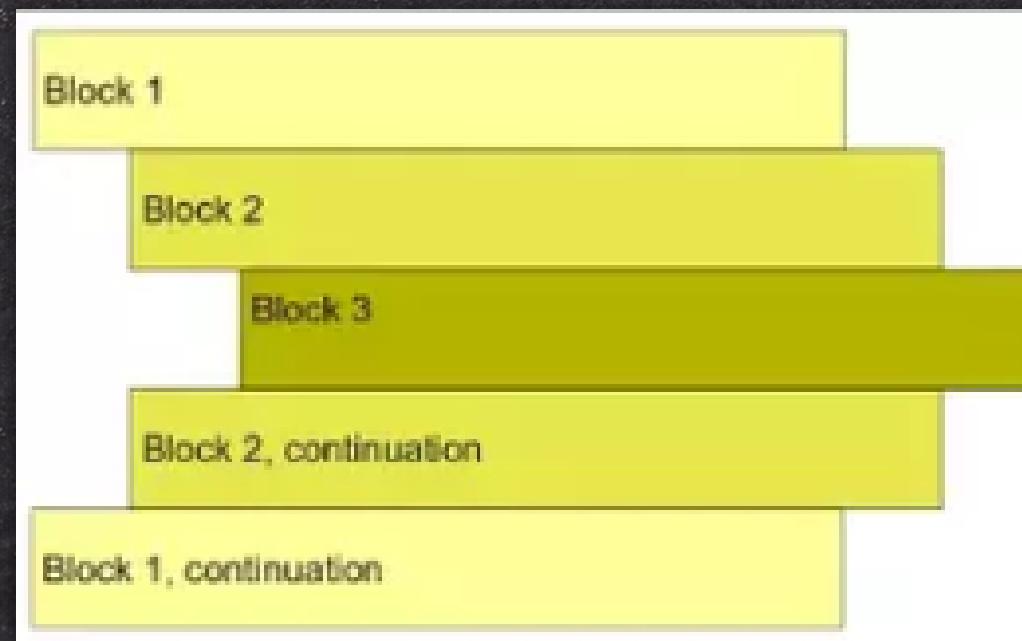
```
Command Prompt - python
C:\Users\alira>python
Python 3.7.7rc1 (tags/v3.7.7rc1:93b7677f9c, Mar 4 2020, 12:05:18) [MSC v.1900 64 bit (AMD64)] on win32
Type "help", "copyright", "credits" or "license" for more information.
>>> # Declare some variables
>>> x = 10
>>> y = 5.0
>>> x
10
>>> y
5.0
>>> type(x)
<class 'int'>
>>> type(y)
<class 'float'>
>>> # Perform some arithmetic operations
>>> x + y
15.0
>>> x - y
5.0
>>> x * y
50.0
>>> x / y
2.0
>>> x // y
2.0
>>> x % y
0.0
```



Indentation in Python

In Python, indentation is used to group statements together and define the scope of control structures. It's important to use consistent indentation throughout your code, typically four spaces per level. If you don't use proper indentation, you will get a syntax error.

در پایتون از فرورفتگی (فاصله‌ی ابتدای متن از اول خط) برای گروه بندی عبارات با هم و تعریف محدوده ساختارهای کنترلی (شرطی، حلقه و ...) استفاده می‌شود. مهم است که از فرورفتگی ثابت در سراسر کد خود استفاده کنید، معمولاً چهار فاصله در هر سطح. اگر از فرورفتگی مناسب استفاده نکنید، با یک خطای سینتکس مواجه خواهید شد.



```
main.py  ×  
1 if x > 0:  
2     print("x is positive")  
3 else:  
4     print("x is not positive")
```



Variable names in python

- A variable name must start with a letter or the underscore character
- A variable name cannot start with a number
- A variable name can only contain alpha-numeric characters and underscores (A-z, 0-9, and _)
- Variable names are case-sensitive (age, Age and AGE are three different variables)
- A variable name cannot be any of the Python keywords.

Reserved Words

False	class	return	is	finally	None	in	as	raise
if	for	lambda	continue	True	def	except	elif	import
from	while	nonlocal	and	del	global	break	try	pass
not	with	or	yield	assert	else			



Variable Types

- Text Type : str
- Numeric Types: int, float
- Boolean Type: bool
- You can get the data type of any object by using the `type()` function.
- You can change type of variables.

```
>>> a = 5
>>> b = 'ali'
>>> type(a)
<class 'int'>
>>> type(b)
<class 'str'>
>>> float(a)
5.0
```



Calculate Pizza Area

```
pizza_area.py ×  
1 # we want to calculate pizza area  
2  
3 # first we have to input Radius of pizza  
4 radius = input(' لطفاً شعاع پیزا را وارد کنید: ')  
5  
6 # change type of input to float  
7 radius = float(radius)  
8  
9 # define pi number  
10 pi = 3.1415  
11  
12 # calculate the area  
13 area = (radius ** 2) * pi  
14  
15 # output the result  
16 print(' The area of the pizza is : ', area, ' cm^2')
```





Calculate average of scores

```
1 # we want to calculate average of some scores for lessons
2 # first we have to input score for each course
3 riazi = input(' lotfan nomre riazi ra vared konid: ')
4 fizik = input(' lotfan nomre fizik ra vared konid: ')
5 zist = input(' lotfan nomre zist ra vared konid: ')
6 zaban = input(' lotfan nomre zaban ra vared konid: ')
7
8 # define numbers of courses
9 numbers = 4
10
11 # change type of input to float
12 riazi = float(riazi)
13 fizik = float(fizik)
14 zist = float(zist)
15 zaban = float(zaban)
16
17 # define sum of numbers
18 sum_scores = riazi + fizik + zist + zaban
19
20 # calculate the average
21 average = sum_scores / numbers
22
23 # output the result
24 print(' The average of the scores is : ', average)
--
```





Boolean variables

Boolean variables are variables that can only have two possible values: true or false. In programming, Boolean variables are often used to represent conditions or states that can be either true or false. In many programming languages including Python, the Boolean data type is represented by the keywords "True" and "False".





Logical Operators

Logical operators are used in programming to combine two or more conditions that result in a Boolean value (true or false). There are three basic logical operators:

1. AND: This operator returns true only if all of the conditions being compared are true. For example, if we have two conditions A and B, A and B is true only if both A and B are true.
2. OR: This operator returns true if at least one of the conditions being compared is true. For example, if we have two conditions A and B, A or B is true if either A or B is true.
3. NOT: This operator returns the opposite of the condition being compared. If the condition is true, the NOT operator returns false, and if the condition is false, the NOT operator returns true.

Logical operators are commonly used in control structures, such as if-else statements and loops (which we discuss them next session), to determine the flow of the program based on multiple conditions.





Logical Operators

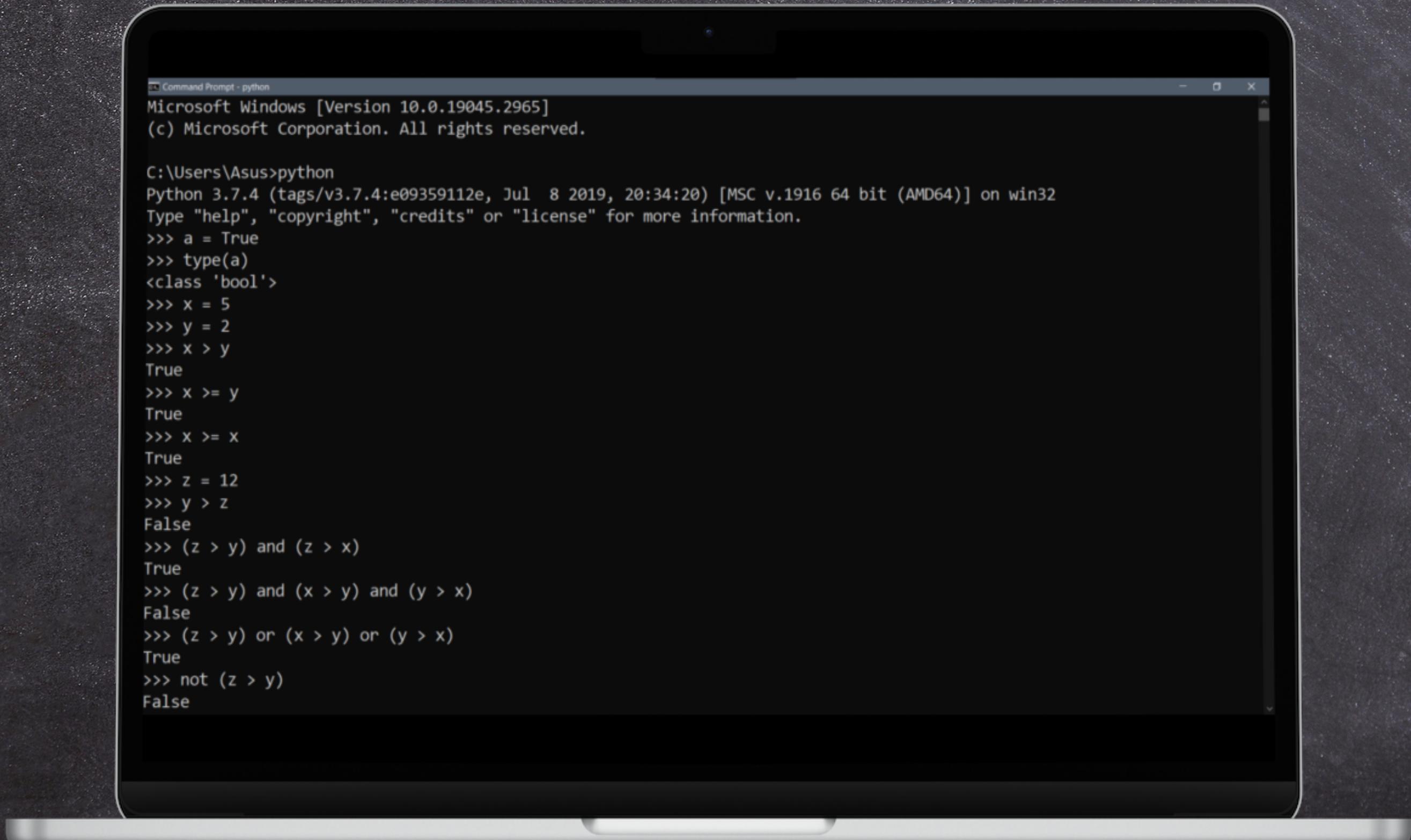
How `<or>` and `<and>` operators work.

x	y	x or y	x	y	x and y
+	+	+	+	+	+
+	-	+	+	-	-
-	+	+	-	+	-
-	-	-	-	-	-

Note that it's not necessary to give two operands to `<or>` and `<and>` operators. Point is that only if all of conditions (regardless of number of them) are true, then `<and>` returns true, and even if one of the conditions (again regardless of number of them) is true, then `<or>` returns true.



Working with Boolean variables and logical operators in the terminal:



```
Command Prompt - python
Microsoft Windows [Version 10.0.19045.2965]
(c) Microsoft Corporation. All rights reserved.

C:\Users\Asus>python
Python 3.7.4 (tags/v3.7.4:e09359112e, Jul  8 2019, 20:34:20) [MSC v.1916 64 bit (AMD64)] on win32
Type "help", "copyright", "credits" or "license" for more information.
>>> a = True
>>> type(a)
<class 'bool'>
>>> x = 5
>>> y = 2
>>> x > y
True
>>> x >= y
True
>>> x >= x
True
>>> z = 12
>>> y > z
False
>>> (z > y) and (z > x)
True
>>> (z > y) and (x > y) and (y > x)
False
>>> (z > y) or (x > y) or (y > x)
True
>>> not (z > y)
False
```

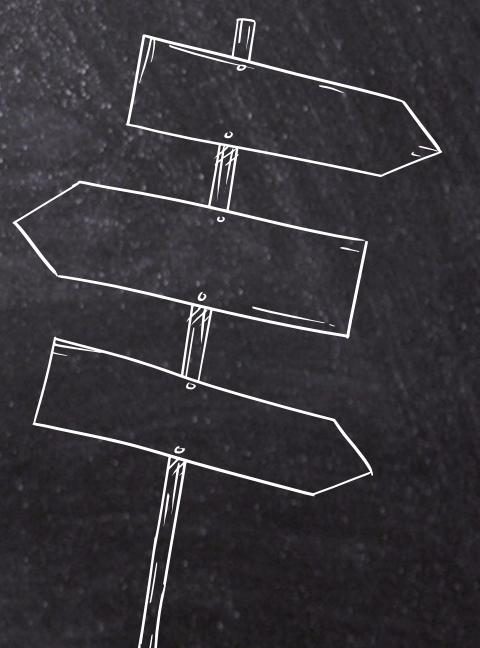


Conditional statements

if - elif - else...

Conditional statements in Python are used to execute a block of code only if a certain condition is met. The most commonly used conditional statements in Python are the if statement, the elif statement, and the else statement.

- The if statement is used to execute a block of code if a certain condition is true.
- The elif statement is used to check for additional conditions if the previous condition(s) were not true.
- The else statement is used to execute a block of code if none of the previous conditions were true.





What percentage of the year has passed?

```
1      # we want to calculate what percental as passed?
2      # first we have to input date od today
3      day = input(' emrooz chandomin rooze mahe? ')
4      month = input(' mahe chandome? ')
5
6      # change type of input to float
7      day = float(day)
8      month = float(month)
9
10     # calculate the percentage
11     if 0 < month <= 6:
12         dayofyear = ((month - 1) * 31) + day
13
14     elif 6 < month <= 11:
15         dayofyear = (6 * 31) + ((month - 7) * 30) + day
16
17     elif month == 12:
18         dayofyear = (6 * 31) + (5 * 30) + day
19
20     else:
21         print(' adade mah ro dorost vared nakardi !!! ')
22
23     if day <= 0 or day >= 32:
24         print('adade rooz ro dorost vared nakardi !!!')
25
26     per_of_year = dayofyear / 365 * 100
27
28     # output the resault
29     print(' today we passed ', per_of_year, '%', ' of the year')
```

امین حسینیا
علی رشیدی



To go or not to go???

```
Beram_biroon_ya_na.py
1 bacheha = input("bacheha radifan? (y/n) ")
2 maman_baba = input("maman babat okeyan? (y/n) ")
3 mashgha = input("mashghato neveshti? (y/n) ")
4
5 if (bacheha == "y"):
6     bacheha = True
7 else:
8     bacheha = False
9
10 if (maman_baba == "y"):
11     maman_baba = True
12 else:
13     maman_baba = False
14
15 if (mashgha == "y"):
16     mashgha = True
17 else:
18     mashgha = False
19
20
21 if bacheha and maman_baba and mashgha:
22     print("kosh begzare pas!!!")
23 elif (not bacheha) and maman_baba and mashgha:
24     print("kheyli badbakhti!!!!")
25 elif bacheha and (not maman_baba) and mashgha:
26     print("boro sozakere kon...")
27 elif bacheha and maman_baba and (not mashgha):
28     print("beshin sare jat mashghato benvis harfam nazan.")
29
30 # We have three conditions. Each can be either True or False. then, we have 2*2*2 situations at all. which we have...
31 # considered four of them here. You can add rest of them and play with announcements you show to the user!
32
```



One of my hearts says go, one of my hearts says don't go...



Film or Foorball???

```
Football_bebinam_ya_film.py
1 manchester = (input("Manchester bazi dare? (y/n)") == "y")
2 milan = (input("milan bazi dare? (y/n)") == "y")
3 perspolis = (input("perspolis bazi dare? (y/n)") == "y")
4
5 print(manchester)
6
7 if manchester or milan or perspolis:
8     print("football bebein!")
9 else:
10    print("film bebein.")
```



I believe this code technically can generate both answers, so I wonder why I've watched three movies ever. two of them were about football. Third one is forgotten by now. Might better you not use it as your daily planner.



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