Essentials of Python

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Contents

1 Variables

```
# int
x1 = 5
```

```
# float or double
k2 = 10.3
```

```
# string
s9 = "salam"
s8 = 'goodbye'
```

```
# 1x is not defined.
x_1 = 10
```

```
print(x1)
print(s9)
print(type(k2))
```

```
5
salam
<class 'float'>
```

```
first_number = 18
second_number = 20
x = first_number + second_number
print(x)
```

```
38
```

```
print(first_number * second_number / x)
```

```
9.473684210526315
```

```
first_string = "saeed"
second_string = "amini"
print(first_string + ' ' + second_string)
```

```
saeed amini
```

```
# It cannot be worked.
# y = first_string / second_string
# print(y)
```

2 List

```
x2 = ['saeed', 'narges', 'mohsen', 'ali', 100, 30.1, [1, 2, 3]]
```

```
print(x2)
```

```
['saeed', 'narges', 'mohsen', 'ali', 100, 30.1, [1, 2, 3]]
```

```
print(type(x2))
```

```
<class 'list'>
```

```
print(x2[0])
```

```
saeed
```

```
print(x2[3])
```

```
ali
```

```
print(x2[-1])
```

```
[1, 2, 3]
```

```
print(x2[1:3])
```

```
['narges', 'mohsen']
```

```
print(x2[2:])
```

```
['mohsen', 'ali', 100, 30.1, [1, 2, 3]]
```

```
x2[2] = 20
```

```
print(x2)
```

```
['saeed', 'narges', 20, 'ali', 100, 30.1, [1, 2, 3]]
```

```
x2.append('amini')
```

```
print(x2)
```

```
['saeed', 'narges', 20, 'ali', 100, 30.1, [1, 2, 3], 'amini']
```

```
x2.remove('ali')
```

```
print(x2)
```

```
['saeed', 'narges', 20, 100, 30.1, [1, 2, 3], 'amini']
```

3 Tuple

```
x2 = ('salam', 'goodby', 20, 1.5)
```

```
print(x2)
```

```
('salam', 'goodby', 20, 1.5)
```

```
print(type(x2))
```

```
<class 'tuple'>
```

```
print(x2[2])
```

```
20
```

```
# unchangeable
# x2[1] = 12
```

4 Set

```
x3 = {'salam', 'goodby', 20, 20}
```

```
print(x3)
```

```
{20, 'salam', 'goodby'}
```

```
print(type(x3))
```

```
<class 'set'>
```

```
#No_Index
# print(x3[0])
```

```
# unchangeable
# x3[1] = 12
```

5 Dictionary

```
# uniquess in keys
x4 = {'saeed': 'amini', 'ali': 'karimi', 'hassan': 'karimi'}
```

```
print(x4)
```

```
{'saeed': 'amini', 'ali': 'karimi', 'hassan': 'karimi'}
```

```
print(type(x4))
```

```
<class 'dict'>
```

```
# Index by keys
print(x4['saeed'])
```

```
amini
```

```
x5 = {'amini': 18, 'karimi': 20, 'saeedi': 15}
```

```
print(x5['saeedi'])
```

```
15
```

6 Conditions (IF)

```
# without Else is possible.
x2 = 16
if x2 > 15:
  print('ok')
```

```
ok
```

```
x2 = 16
if x2 > 15:
    print('ok')
    print('ok2')
```

```
ok
ok2
```

```
x2 = 19
if x2 > 15:
  print('ok')
  print('ok2')
else:
  print('nok')
```

```
ok
ok2
```

```
if x2 > 20:
  if x2 > 30:
    print('great')
  else:
    print('good')
  print('wow')
```

```
if x2 == 20:
  if x2 > 19:
    print('#################')
  else:
    print('!!!!!!!!!!!!!!!!')
  print('wow, you got 20')
else:
  print('bad')
```

```
bad
```

```
if x2 == 20:
  if x2 > 19:
    print('#################')
  else:
    print('!!!!!!!!!!!!!!!!')
  print('wow, you got 20')
else:
  print('bad')
print('goodbye')
```

```
bad
goodbye
```

```
# int
# elif
# x2 = int(input('Please enter a number: '))
```

```
# password = input('Please enter the password: ')
x2 = 20
password = 'jgsh78uhb'
if password == 'jgsh78uhb' and (x2 > 18):
  print('exactly')
elif password == 'jgsh78uhb' and x2 > 14:
  print('nearly right')
else:
  print('false')
```

```
exactly
```

```
# not
# x2 = int(input('Please enter a number: '))
# password = input('Please enter the password: ')
x2 = 17
password = 'jgsh78uhb'
if password == 'jgsh78uhb' and not (x2 > 18):
  print('exactly')
elif password == 'jgsh78uhb' and x2 > 14:
  print('nearly right')
else:
  print('false')
```

```
exactly
```

```
# or
# x2 = int(input('Please enter a number: '))
# password = input('Please enter the password: ')
x2 = 19
password = 'sa'
if password == 'jgsh78uhb' or (x2 > 18):
  print('exactly')
elif password == 'jgsh78uhb' and x2 > 14:
  print('nearly right')
else:
  print('false')
```

```
exactly
```

7 Loops (For and While)

```
l = ['amini', 'karami', 'hassani', 'tavakoli']
```

```
# for
for i in l:
  print('Hello', i)
```

```
Hello amini
Hello karami
Hello hassani
Hello tavakoli
```

```python
# range
# 51
for x in range(0, 51):
  x2 = x ** 2
  print(x2)
```

```
0
1
4
9
16
25
36
49
64
81
100
121
144
169
196
225
256
289
324
361
400
441
484
529
576
625
676
729
784
841
900
961
1024
1089
1156
1225
1296
1369
1444
1521
1600
1681
1764
1849
1936
2025
2116
2209
```

```
2304
2401
2500
```

```
# while
x = 30
while x > 20:
  print(x)
  x = x - 1
print('GoodBye')
```

```
30
29
28
27
26
25
24
23
22
21
GoodBye
```

8 Function

```
# without input
def say_hello():
  print('hello')
  print('goodbye')
```

```
i = 10
j = 20
say_hello()
print('last line')
```

```
hello
goodbye
last line
```

```
# with input
def say_hello(first_name, last_name):
  print('hello', first_name)
  print('goodbye', last_name)
```

```
i = 10
j = 20
say_hello('Saeed', 'amini')
print('last line')
```

```
hello Saeed
goodbye amini
last line
```

```
def get_age(name, family='amini'):
  if name == 'saeed':
    return 31
  elif name == '':
    return 28
  else:
    return -1
```

```
age = get_age('')
print(age)
```

```
28
```

9 Class

```
#multifunction
class Person:
  def __init__(self, first_name, last_name):
    self.first_name = first_name
    self.last_name = last_name
  def set_first_name(self, first_name):
    self.first_name = first_name
    return self.first_name
  def return_last_name(self):
    return self.last_name
```

```
p1 = Person("Saeed", "amini")
p2 = Person("Ali", "Karimi")
ln = p1.return_last_name()
ln2 = p2.return_last_name()
print(ln)
print(ln2)
```

```
amini
Karimi
```