

```
In [1]: students = [  
        'student 1',  
        'student 2',  
    ]  
  
import random  
def pick():  
    return random.choice(students)
```

```
In [2]: pick()
```

```
Out[2]: 'student 2'
```

Τελεστές

- +
- -
- /
- //
- *
- %
- **
- <
- >
- <=
- >=
- !=
- ==
- not
- in
- is

```
In [9]: 5%2
```

```
Out[9]: 1
```

```
In [11]: 10%3
```

```
Out[11]: 1
```

```
In [14]: 25%5
```

```
Out[14]: 0
```

```
In [21]: pick()
```

```
Out[21]: 'Ελσα'
```

```
In [16]: 5<3
```

```
Out[16]: False
```

```
In [17]: 'Αθανασία' < 'Μαρία'
```

```
Out[17]: True
```

```
In [20]: 'Αλεξανδρος' < 'Αλεξανδρα'
```

```
Out[20]: False
```

```
In [22]: True > False
```

```
Out[22]: True
```

```
In [23]: 2 != 1+1
```

```
Out[23]: False
```

```
In [26]: pick()
```

```
Out[26]: 'Αρτεμις'
```

```
In [25]: 3 != 3.000000000000001
```

```
Out[25]: True
```

```
In [27]: 3 != 3.0
```

```
Out[27]: False
```

```
In [28]: 'Μήτσος' != 'Μήτσο' + 'ς'
```

```
Out[28]: False
```

```
In [29]: True != 1
```

```
Out[29]: False
```

```
In [30]: True + True != 2
```

```
Out[30]: False
```

```
In [31]: pick()
```

```
Out[31]: 'Μαρία'
```

```
In [32]: 3 == 5-2
```

```
Out[32]: True
```

```
In [33]: 3 == 3.0
```

```
Out[33]: True
```

```
In [54]: pick()
```

```
Out[54]: 'Κλάρα'
```

```
In [ ]:
```

```
In [36]: # ΑΠΟΘΗΚΕΥΣΕ ΤΟ ΕΔΩ = ΥΠΟΛΟΓΙΣΕ ΤΙ ΒΡΙΣΚΕΤΑΙ ΕΔΩ
```

```
In [45]: a = 3+2
```

```
In [44]: a
```

```
Out[44]: 5
```

```
In [46]: 4  
         5  
         6
```

```
Out[46]: 6
```

```
In [47]: print (4)  
         print (5)  
         print (6)
```

```
4  
5  
6
```

```
In [49]: 'Αλέξανδρος' == 'Αλεξάνδρα'
```

```
Out[49]: False
```

```
In [52]: 3**2
```

```
Out[52]: 9
```

```
In [53]: 'αλέ' in 'αλέξανδρος'
```

```
Out[53]: True
```

```
In [55]: 'h' in 'heraklion'
```

```
Out[55]: True
```

```
In [57]: 'h' in 'Athens'
```

```
Out[57]: True
```

```
In [59]: 'h' in 'Patra'
```

```
Out[59]: False
```

```
In [64]: pick()
```

```
Out[64]: 'Αιμίλιος'
```

```
In [60]: 'h' in 'h'
```

```
Out[60]: True
```

```
In [61]: 'h' in 'H'
```

```
Out[61]: False
```

```
In [63]: 3 in 33
```

```
-----  
TypeError                                Traceback (most recent call last)  
<ipython-input-63-7a3462dd7e56> in <module>()  
----> 1 3 in 33  
  
TypeError: argument of type 'int' is not iterable
```

```
In [65]: 3 in '33'
```

```
-----  
TypeError                                Traceback (most recent call last)  
<ipython-input-65-5e6f0dfc6b4b> in <module>()  
----> 1 3 in '33'
```

```
TypeError: 'in <string>' requires string as left operand, not int
```

```
In [66]: '3' in '34'
```

```
Out[66]: True
```

```
In [67]: '3' in '3333333333'
```

```
Out[67]: True
```

```
In [68]: '3' in '4444444444443'
```

```
Out[68]: True
```

```
In [69]: '323u47523874562387462345234'.count('3')
```

```
Out[69]: 6
```

```
In [70]: a = 'μήτσος'  
        b = 'μήτσος'
```

```
In [78]: pick()
```

```
Out[78]: 'Πολίνα'
```

```
In [72]: a == b
```

```
Out[72]: True
```

```
In [73]: a is b
```

```
Out[73]: False
```

```
In [74]: c = b
```

```
In [75]: c is b
```

```
Out[75]: True
```

```
In [77]: c
```

```
Out[77]: 'μήτσος'
```

```
In [79]: b
```

```
Out[79]: 'μήτσος'
```

```
In [80]: c += ' 2'
```

```
In [81]: c
```

```
Out[81]: 'μήτσος 2'
```

```
In [82]: b
```

```
Out[82]: 'μήτσος'
```

```
In [83]: b is c
```

```
Out[83]: False
```

```
In [84]: type('μήτσος')
```

```
Out[84]: str
```

```
In [85]: type(3)
```

```
Out[85]: int
```

```
In [86]: type(4.4)
```

```
Out[86]: float
```

```
In [87]: type(True)
```

```
Out[87]: bool
```

```
In [89]: type(c)
```

```
Out[89]: str
```

```
In [88]: pick()
```

```
Out[88]: 'Γιάννης'
```

```
In [90]: type(None)
```

```
Out[90]: NoneType
```

```
In [91]: c
```

```
Out[91]: 'μήτσος 2'
```

```
In [92]: type(c) is str
```

```
Out[92]: True
```

```
In [93]: t = type(c) is str
```

```
In [94]: t
```

```
Out[94]: True
```

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

```
In [96]: not True
```

```
Out[96]: False
```

```
In [97]: not False
```

```
Out[97]: True
```

```
In [99]: not 4
```

```
Out[99]: False
```

```
In [101]: not ''
```

```
Out[101]: True
```

```
In [103]: not not True
```

```
Out[103]: True
```

```
In [104]: pick()
```

```
Out[104]: 'Αθανασία'
```

```
In [105]: not not (True or False)
```

```
Out[105]: True
```

Λίστες

```
In [106]: [2,3,6]
```

```
Out[106]: [2, 3, 6]
```

```
In [107]: a = [2,3,6]
```

```
In [116]: pick()
```

```
Out[116]: 'Γιάννης'
```

```
In [111]: a[0]
```

```
Out[111]: 2
```

```
In [113]: a[2]
```

```
Out[113]: 6
```

```
In [110]: 'abc'[1]
```

```
Out[110]: 'b'
```

```
In [114]: a
```

```
Out[114]: [2, 3, 6]
```

```
In [115]: a = [2,3,4,5,4,3,4,5,6,7,8]
```

```
In [117]: a[-1]
```

```
Out[117]: 8
```

```
In [120]: pick()
```

```
Out[120]: 'Δανάη'
```



```
In [144]: a[3]
```

```
Out[144]: [4, 5, 6]
```

```
In [145]: pick()
```

```
Out[145]: 'Αιμίλιος'
```

```
In [146]: a[3][1]
```

```
Out[146]: 5
```

```
In [147]: [[1,2,3], [4,5,6], [7,8,9]]
```

```
Out[147]: [[1, 2, 3], [4, 5, 6], [7, 8, 9]]
```

```
In [149]: [3,3,4,5,6,3,2].count(3)
```

```
Out[149]: 3
```

```
In [151]: [3,3,4,5,6,3,2].count(7)
```

```
Out[151]: 0
```

```
In [153]: 3 in [3,3,4,5,6,3,2]
```

```
Out[153]: True
```

```
In [189]: 7 in [3,3,4,5,6,3,2]
```

```
Out[189]: False
```

```
In [191]: 'Mitsos' in [3,3,4,5,6,3,2]
```

```
Out[191]: False
```

```
In [193]: 1 in [2, [1,2], 3]
```

```
Out[193]: False
```

```
In [196]: pick()
```

```
Out[196]: 'Ελσα'
```

```
In [195]: [1,2] in [2, [1,2], 3]
```

```
Out[195]: True
```

```
In [197]: [2,1] in [2, [1,2], 3]
```

```
Out[197]: False
```

```
In [204]: 3 in [1,2] in [2, [1,2], 3]
```

```
Out[204]: False
```

```
In [ ]: 1 in ([1,2] in [2, [1,2], 3])
```


In [199]: 1 in True

```
-----
TypeError                                Traceback (most recent call last)
<ipython-input-199-d3ff63f304dc> in <module>()
----> 1 1 in True
```

TypeError: argument of type 'bool' is not iterable

In [198]: 1+2+3

Out[198]: 6

In [210]: 1+(2+3)

Out[210]: 6

In [211]: (1+2)+3

Out[211]: 6

In []:

In [214]: 1 in ([1,2] in [2, [1,2], 3])

```
-----
TypeError                                Traceback (most recent call last)
<ipython-input-214-bdb883244bcc> in <module>()
----> 1 1 in ([1,2] in [2, [1,2], 3])
```

TypeError: argument of type 'bool' is not iterable

In [215]: 1 in True

```
-----
TypeError                                Traceback (most recent call last)
<ipython-input-215-d3ff63f304dc> in <module>()
----> 1 1 in True
```

TypeError: argument of type 'bool' is not iterable

In [209]: 1 in [1,2] in 'Mi'

```
-----
TypeError                                Traceback (most recent call last)
<ipython-input-209-ec2c1b7a7d00> in <module>()
----> 1 1 in [1,2] in 'Mi'
```

TypeError: 'in <string>' requires string as left operand, not list

In [216]: 'in' in 'instrument'

Out[216]: True

In [217]: 3 in [1,2,3]

Out[217]: True

In [218]: a = [1,2,3]

In [220]: [1,2,3] + [4]

Out[220]: [1, 2, 3, 4]

In [221]: `[1,2,3] + 4`

```
-----
TypeError                                Traceback (most recent call last)
<ipython-input-221-a794e8cfa556> in <module>()
----> 1 [1,2,3] + 4

TypeError: can only concatenate list (not "int") to list
```

In [222]: `[1,2,3] + [4,5,6]`

Out[222]: `[1, 2, 3, 4, 5, 6]`

In [223]: `a = [1,2,3]`

In [224]: `a += [4]`

In []: `a += [4]`
`a = [1,2,3] + [4]`

In [226]: `a = [4,5,6]`

In []:

In []: `[0,4,5,6]`

In [227]: `pick()`

Out[227]: `'Αρτεμις'`

In [228]: `a = [0] + a`

In [229]: `a`

Out[229]: `[0, 4, 5, 6]`

In [230]: `a = [3,4,6,7]`

In []: `[3,4,5,6,7]`

In [231]: `pick()`

Out[231]: `'Μαρία'`

In [233]: `a[0:2]`

Out[233]: `[3, 4]`

In [235]: `a[2:]`

Out[235]: `[6, 7]`

In [347]: `a = 5 + 7`

In [236]: `a[0:2] + a[2:]`

Out[236]: `[3, 4, 6, 7]`

```
In [237]: a[0:2] + [5] + a[2:]
```

```
Out[237]: [3, 4, 5, 6, 7]
```

```
In [238]: a[:2] + [5] + a[2:]
```

```
Out[238]: [3, 4, 5, 6, 7]
```

```
In [242]: a = [3,4,6,7]
```

```
In [243]: a.insert(2, 5)
```

```
In [244]: a
```

```
Out[244]: [3, 4, 5, 6, 7]
```

```
In [245]: a
```

```
Out[245]: [3, 4, 5, 6, 7]
```

```
In [246]: a = [3,4,6,7]
```

```
In [247]: pick()
```

```
Out[247]: 'Δανάη'
```

```
In [248]: a[2] = 100
```

```
In [249]: a
```

```
Out[249]: [3, 4, 100, 7]
```

```
In [250]: b = 'mitsos'
```

```
In [256]: a = [3,4,6,7]
```

```
In [253]: a = a[:-1]
```

```
In [ ]:
```

```
In [259]: help(a.remove)
```

```
Help on built-in function remove:
```

```
remove(value, /) method of builtins.list instance  
Remove first occurrence of value.
```

```
Raises ValueError if the value is not present.
```

```
In [258]: a
```

```
Out[258]: [4, 6, 7]
```

```
In [261]: 3 >= 3
```

```
Out[261]: True
```

In [263]: `[2,5] < [1,7]`

Out[263]: `False`

In [265]: `[2,5] < [3]`

Out[265]: `True`

In [267]: `[2,5] < [2,7]`

Out[267]: `True`

In [268]: `'ae' < 'ak'`

Out[268]: `True`

In [269]: `'ae' < 'b'`

Out[269]: `True`

In [270]: `[2,5] < [2,5,7]`

Out[270]: `True`

In [271]: `'ab' < 'aba'`

Out[271]: `True`

In [273]: `[2,5] * 7`

Out[273]: `[2, 5, 2, 5, 2, 5, 2, 5, 2, 5, 2, 5, 2, 5]`

In [274]: `[2,5] * [2,5]`

```
-----
TypeError                                Traceback (most recent call last)
<ipython-input-274-92d476b42311> in <module>()
----> 1 [2,5] * [2,5]

TypeError: can't multiply sequence by non-int of type 'list'
```

In [275]: `[4] * 10`

Out[275]: `[4, 4, 4, 4, 4, 4, 4, 4, 4, 4]`

In [276]: `list('mitsos')`

Out[276]: `['m', 'i', 't', 's', 'o', 's']`

In [278]: `list([4,5,6,7])`

Out[278]: `[4, 5, 6, 7]`

In [280]: `[1,2,3]`

Out[280]: `[1, 2, 3]`

if

```
In [281]: if 3<4:
           print ('hello')

hello
```

```
In [283]: if 4<3:
           print ('hello')
```

```
In [285]: print ('1')
           if 3<4:
               print ('hello')
           print ('2')
```

```
1
hello
2
```

```
In [288]: print ('1')
           if 4<3:
               print ('hello')
           print ('2')
```

1

2

```
In [290]: print ('1')
           if 'Mitsos':
               print ('hello')
           print ('2')
```

```
1
hello
2
```

```
In [292]: print ('1')
           if '':
               print ('hello')
           print ('2')
```

1

2

```
In [293]: print ('1')
           if []:
               print ('hello')
           print ('2')
```

1

2

```
In [295]: print ('1')  
          if [[[[[[[[[[[[[[[[[[[]]]]]]]]]]]]]]]]] :  
              print ('hello')  
          print ('2')
```

1
hello
2

```
In [299]: print ('1')
          if True :
              print ('hello')
              print ('mitsos')
          print ('2')
```

```
1
hello
mitsos
2
```

```
In [301]: print ('1')
          if False :
              print ('hello')
          print ('mitsos')
          print ('2')
```

```
1
mitsos
2
```

```
In [305]: print ('1')
          if True:
              print ('hello')

              if True:
                  print ('Kostas')

              print ('mitsos')

          print ('2')
```

```
1
hello
Kostas
mitsos
2
```

```
In [307]: print ('1')
          if True:
              print ('hello')
              if True:
                  print ('Kostas')

          print ('2')
```

```
1
hello
Kostas
2
```

```
In [308]: if True:
          print ('hello')
```

```
hello
```

```
In [309]: if True:

          print ('hello')
```

```
hello
```

```
In [310]: if True:
          print ('hello')
```

```
hello
```

```
In [314]: if True:
           print ('hello')
           print ('mitsos')
```

```
hello
mitsos
```

```
In [315]: a      =      5+      7
```

```
In [316]: a=5+7
```

```
In [ ]:
```

```
In [300]: pick()
```

```
Out[300]: 'Ελσα'
```

```
In [303]: from __future__ import braces
```

```
File "<ipython-input-303-b9e031678f96>", line 1
      from __future__ import braces
                                ^
```

```
SyntaxError: not a chance
```

```
In [348]: if True:
           print ('Hello')
```

```
Hello
```

```
In [351]: print ('1')
           if True:
               print ('Hello')
           print ('2')
```

```
1
Hello
2
```

```
In [353]: print ('1')
           if True:
               print ('2')
```

```
File "<ipython-input-353-3c9ad418f11c>", line 4
      print ('2')
      ^
```

```
IndentationError: expected an indented block
```

```
In [354]: print ('1')
           if True:
               pass
           print ('2')
```

```
1
2
```

```
In [355]: pass
```

```
In [357]: print ('1')
          if True:
              print ("hello")
          else:
              print ('Mitsos')
          print ('2')
```

```
1
hello
2
```

```
In [359]: print ('1')
          if False:
              print ("hello")
          else:
              print ('Mitsos')
          print ('2')
```

```
1
Mitsos
2
```

```
In [ ]: print ('1')

        if True:
            print ("hello")

        print ('2')
```

```
In [360]: print ('hello')
          print ('mitsos')
```

```
File "<ipython-input-360-6e383a2739d3>", line 2
    print ('mitsos')
    ^
```

IndentationError: unexpected indent

```
In [362]:     print ('hello')
          print ('mitsos')
```

```
hello
mitsos
```

```
In [365]: print ('hello')
          a=1
          if a==1:
              print ('mitsos')
          else:
              print ('maria')
          print ('kostas')
```

```
hello
mitsos
kostas
```



```
In [367]: print ('hello')
a=2
if a==1:
    print ('mitsos')
else:
    print ('maria')
print ('kostas')
```

hello
maria
kostas

```
In [368]: print ('hello')
a=2
if a==1:
    print ('mitsos')
elif a==2:
    print ('elenh')
else:
    print ('maria')
print ('kostas')
```

hello
elenh
kostas

```
In [370]: print ('hello')
a=3
if a==1:
    print ('mitsos')
elif a==2:
    print ('elenh')
print ('kostas')
```

hello
kostas

```
In [372]: print ('hello')
a=3
if a==1:
    print ('mitsos')
elif a==2:
    print ('elenh')
elif a==3:
    print ('dhmhtrhs')
print ('kostas')
```

hello
dhmhtrhs
kostas

while

```
In [383]: a=1
while a<10:
    print (a)
    a+=1
print ('mitsos')
print (a)
```

```
1
2
3
4
5
6
7
8
9
mitsos
10
```

```
In [384]: a=1

while a<100:
    if a%2 == 1:
        print (a)
    a+=1
```

```
1
3
5
7
9
11
13
15
17
19
21
23
25
27
29
31
33
35
37
39
41
43
45
47
49
51
53
55
57
59
61
63
65
67
69
71
73
75
77
79
81
83
85
87
89
91
93
95
97
99
```

```
In [382]: a=1
a += 1
print (a)
```

```
2
```

```
In [380]: pick()
```

```
Out[380]: 'Πολίνα'
```

```
In [385]: a = 1
while a<=10:
    print (a*8)
    a+=1
```

```
8
16
24
32
40
48
56
64
72
80
```

```
In [387]: a = 0
while a<=10:
    print (a*8)
    a+=1
```

```
0
8
16
24
32
40
48
56
64
72
80
```

```
In [393]: a=30
b=40
print ('Mitsos is', a, ' years old and his brother is', b)
```

```
Mitsos is 30  years old and his brother is 40
```

```
In [396]: a = 1
while a<=10:
    print (a, 'fores to 8 mas kanei', a*8)
    a+=1
```

```
1 fores to 8 mas kanei 8
2 fores to 8 mas kanei 16
3 fores to 8 mas kanei 24
4 fores to 8 mas kanei 32
5 fores to 8 mas kanei 40
6 fores to 8 mas kanei 48
7 fores to 8 mas kanei 56
8 fores to 8 mas kanei 64
9 fores to 8 mas kanei 72
10 fores to 8 mas kanei 80
```

```
In [400]: a = 1
          while a<=10:
              b=1
              while b<=10:
                  print (a, 'fores to ', b, ' mas kanei', a*b)
                  b+=1
              a+=1
```

```
1 fores to 1 mas kanei 1
1 fores to 2 mas kanei 2
1 fores to 3 mas kanei 3
1 fores to 4 mas kanei 4
1 fores to 5 mas kanei 5
1 fores to 6 mas kanei 6
1 fores to 7 mas kanei 7
1 fores to 8 mas kanei 8
1 fores to 9 mas kanei 9
1 fores to 10 mas kanei 10
2 fores to 1 mas kanei 2
2 fores to 2 mas kanei 4
2 fores to 3 mas kanei 6
2 fores to 4 mas kanei 8
2 fores to 5 mas kanei 10
2 fores to 6 mas kanei 12
2 fores to 7 mas kanei 14
2 fores to 8 mas kanei 16
2 fores to 9 mas kanei 18
2 fores to 10 mas kanei 20
3 fores to 1 mas kanei 3
3 fores to 2 mas kanei 6
3 fores to 3 mas kanei 9
3 fores to 4 mas kanei 12
3 fores to 5 mas kanei 15
3 fores to 6 mas kanei 18
3 fores to 7 mas kanei 21
3 fores to 8 mas kanei 24
3 fores to 9 mas kanei 27
3 fores to 10 mas kanei 30
4 fores to 1 mas kanei 4
4 fores to 2 mas kanei 8
4 fores to 3 mas kanei 12
4 fores to 4 mas kanei 16
4 fores to 5 mas kanei 20
4 fores to 6 mas kanei 24
4 fores to 7 mas kanei 28
4 fores to 8 mas kanei 32
4 fores to 9 mas kanei 36
4 fores to 10 mas kanei 40
5 fores to 1 mas kanei 5
5 fores to 2 mas kanei 10
5 fores to 3 mas kanei 15
5 fores to 4 mas kanei 20
5 fores to 5 mas kanei 25
5 fores to 6 mas kanei 30
5 fores to 7 mas kanei 35
5 fores to 8 mas kanei 40
5 fores to 9 mas kanei 45
5 fores to 10 mas kanei 50
6 fores to 1 mas kanei 6
6 fores to 2 mas kanei 12
6 fores to 3 mas kanei 18
6 fores to 4 mas kanei 24
6 fores to 5 mas kanei 30
6 fores to 6 mas kanei 36
6 fores to 7 mas kanei 42
6 fores to 8 mas kanei 48
6 fores to 9 mas kanei 54
6 fores to 10 mas kanei 60
7 fores to 1 mas kanei 7
7 fores to 2 mas kanei 14
7 fores to 3 mas kanei 21
7 fores to 4 mas kanei 28
7 fores to 5 mas kanei 35
7 fores to 6 mas kanei 42
7 fores to 7 mas kanei 49
7 fores to 8 mas kanei 56
```

```
In [401]: a=51234123
```

```
In [419]: %%timeit
len(str(a))
```

217 ns ± 12.2 ns per loop (mean ± std. dev. of 7 runs, 1000000 loops each)

```
In [423]: ###timeit
a=51234123
c=0
upoloipo = a
while upoloipo != 0:
    upoloipo = upoloipo // 10
    c += 1
print (c)
```

8

```
In [424]: a = 'zabarakatranemia'
```

```
In [434]: len(a)
```

Out[434]: 16

```
In [431]: ###timeit
a.count('a')
```

Out[431]: 6

```
In [437]: index = 0
c = 0
while index < len(a):
    if a[index] == 'a':
        c += 1
    index += 1
print (c)
#print (index)
```

6

```
In [438]: a = 'zabarakatranemia'
```

```
In [439]: a[::-1]
```

Out[439]: 'aimenartakarabaz'

```
In [447]: index = len(a)-1
          anapodo = ''
          while index >= 0:
              anapodo = anapodo + a[index]
              print (anapodo)
              index -= 1
          print (anapodo)
```

```
a
ai
aim
aime
aimen
aimena
aimenar
aimenart
aimenarta
aimenartak
aimenartaka
aimenartakar
aimenartakara
aimenartakarab
aimenartakaraba
aimenartakarabaz
aimenartakarabaz
```

```
In [440]: a
```

```
Out[440]: 'zabarakatranemia'
```

```
In [446]: '' + a[len(a)-1] + a[len(a)-2] + a[len(a)-3]
```

```
Out[446]: 'aim'
```

```
In [436]: 16<16
```

```
Out[436]: False
```

```
In [433]: pick()
```

```
Out[433]: 'Πιάννης'
```