In [17]:
```
import random
students = [
    'Tzwrtzina',
    'Andreas',
    'Xristos',
    'Andromaxh',
    'Danah',
    'Antwnia',
    'Aris',
    'Maria',
    'Sofia',
    'Iwanna',
    'Aggelos',
]

def random_student():
    return random.choice(students)
```

In [18]:
```
rs = random_student
```

In [19]:
```
rs()
```

Out[19]:
```
'Danah'
```

In [ ]:
```

```

In [1]:
```
print ("hello")
```

```
hello
```

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

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

```
---------------------------------------------------------------------------
NameError                                 Traceback (most recent call last)
<ipython-input-1-cb9bacd097d9> in <module>()
----> 1 print (a)

NameError: name 'a' is not defined
```

In [2]:
```
'alexandros' + ' ' + 'kanterakis'
```

Out[2]:
```
'alexandros kanterakis'
```

In [3]:
```
'a' * 10
```

Out[3]:
```
'aaaaaaaaaa'
```

In [4]:
```
'a'   'b'
```

Out[4]:
```
'ab'
```

In [5]:
```
'a'  + 'b'
```

Out[5]:
```
'ab'
```

In [6]:
```
'a'
```

Out[6]: 'a'

In [7]:
```
"a"
```

Out[7]: 'a'

In [8]:
```
'''a'''
```

Out[8]: 'a'

In [9]:
```
"""a"""
```

Out[9]: 'a'

In [10]:
```
'hello
my name is
alexandros'
```

```
  File "<ipython-input-10-171a334fcb52>", line 1
    'hello
          ^
SyntaxError: EOL while scanning string literal
```

In [11]:
```
'''hello
my name is
alexandros
'''
```

Out[11]: 'hello \nmy name is\nalexandros\n'

In [12]:
```
a='''hello
my name is
alexandros
'''
```

In [13]:
```
print (a)
```

```
hello
my name is
alexandros
```

In [14]:
```
"αλέξανδρος".upper()
```

Out[14]: 'ΑΛΕΞΑΝΔΡΟΣ'

In [15]:
```
a=1
```

In [16]:
```
a = a+1
print (a)
```

```
2
```

In [20]:
```
a=1
b=a
a=2
print (b)
```

```
1
```

In [21]:
```
a=1
 print(a)
```

```
  File "<ipython-input-21-f7d09fb04155>", line 2
    print(a)
    ^
IndentationError: unexpected indent
```

In [22]:
```
a=1
print(a)
```

```
1
```

In [24]:
```
a=1;
b=2
c=3
```

In [25]:
```
a=1;b=1;c=1
```

In [26]:
```
!ls -l test_5.csv
```

```
-rw-r--r--  1 alexandroskanterakis  staff  24745812 May 28 16:50 test_5.csv
```

In [27]:
```
! python -c "a=1;print (a)"
```

```
1
```

In [28]:
```
name='alex'
print ('my name is ', name)
```

```
my name is  alex
```

In [29]:
```
a=1
b=2
print (a,b)
```

```
1 2
```

In [31]:
```
name='alex'
print ('my name is {}'.format(name))
```

```
my name is alex
```

In [32]:
```
'my {} name is {}'.format(1,2)
```

Out[32]:
```
'my 1 name is 2'
```

In [33]:
```
'my{} name is:{}'.format(1,2)
```

Out[33]:
```
'my1 name is:2'
```

In [34]:
```
'hello my name is {name}'.format(name='alex')
```

Out[34]:
```
'hello my name is alex'
```

In [36]:
```
'hello my {b} name is {name}'.format(name='alex', b=100)
```

Out[36]:
```
'hello my 100 name is alex'
```

In [37]:
```
'hello my {} name is {}'.format('alex', 100)
```

Out[37]:
```
'hello my alex name is 100'
```

In [38]:
```
print ('hello my name is' name)
```

```
  File "<ipython-input-38-77cef4e4161f>", line 1
    print ('hello my name is' name)
                               ^
SyntaxError: invalid syntax
```

In [39]:
```
print ('hello my name is' 'alex')
```

```
hello my name isalex
```

In [40]:
```
'hello my' + b + 'name is ' + name
```

```
---------------------------------------------------------------------------
TypeError                                 Traceback (most recent call last)
<ipython-input-40-6fb4696a03e7> in <module>()
----> 1 'hello my' + b + 'name is ' + name

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

In [41]:
```
age = 42
'my age is ' + age
```

```
---------------------------------------------------------------------------
TypeError                                 Traceback (most recent call last)
<ipython-input-41-1efe0415502e> in <module>()
      1 age = 42
----> 2 'my age is ' + age

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

In [42]:
```
age = 42
'my age is ' + str(age)
```

Out[42]:
```
'my age is 42'
```

In [43]:
```
str(42)
```

Out[43]:
```
'42'
```

In [44]:
```
str(5.5555)
```

Out[44]:
```
'5.5555'
```

In [45]:
```
str(5.5555) + ' mitsos'
```

Out[45]:
```
'5.5555 mitsos'
```

In [46]:
```
str('44')
```

Out[46]:
```
'44'
```

In [47]:
```
int('5')
```

Out[47]:
```
5
```

In [48]:
```
float('5.6')
```

Out[48]: 5.6

In [50]:
```
int('           5         ')
```

Out[50]: 5

In [51]:
```
float('5')
```

Out[51]: 5.0

In [52]:
```
int('5')
```

Out[52]: 5

In [53]:
```
print (' my name is \'alex\' ')
```

```
 my name is 'alex'
```

In [54]:
```
print (" my name is \"alex\" ")
```

```
 my name is "alex"
```

In [55]:
```
print (" my name is 'alex' ")
```

```
 my name is 'alex'
```

In [56]:
```
print (' my name is "alex" ')
```

```
 my name is "alex"
```

In [57]:
```
print (''' my 'name' is "alex" ''')
```

```
 my 'name' is "alex"
```

In [58]:
```
print (''' my 'name' is\n "alex" ''')
```

```
 my 'name' is
 "alex"
```

In [59]:
```
print (''' my 'name' is\t "alex" ''')
```

```
 my 'name' is    "alex"
```

In [62]:
```
a=3
a += 2 # a = a + 2
print (a)
```

```
5
```

In [63]:
```
a=3
a -= 2 # a = a - 2
print (a)
```

```
1
```

In [64]:
```
a=3
a *= 2 # a = a * 2
print (a)
```

```
6
```

In [65]:
```
a=3
a /= 2 # a = a / 2
print (a)
```

```
1.5
```

In [68]:
```
a=3
a += 1 # a++ --> DEN YPARXEI!!
print (a)
```

```
4
```

In [ ]:
```

```

In [66]:
```
rs()
```

Out[66]: 'Xristos'

In [69]:
```
True
```

Out[69]: True

In [70]:
```
False
```

Out[70]: False

In [75]:
```
rs()
```

Out[75]: 'Antwnia'

In [72]:
```
True or False
```

Out[72]: True

In [73]:
```
False or False
```

Out[73]: False

In [74]:
```
True or True
```

Out[74]: True

In [76]:
```
True and False
```

Out[76]: False

In [77]:
```
True and True
```

Out[77]: True

In [78]:
```
False and False
```

Out[78]: False

In [81]:
```
hlios = False
sunefia = False


hlios or sunefia
```

Out[81]: False

In [83]:
```
False or False or False or False
```

Out[83]: False

In [84]:
```
False or True or False or False
```

Out[84]: True

In [85]:
```
False and False and False and False
```

Out[85]: False

In [88]:
```
True and True and True and True
```

Out[88]: True

In [89]:
```
True and True and True and False
```

Out[89]: False

In [ ]:
```
True and True and True and False
```

In [87]:
```
rs()
```

Out[87]: 'Maria'

In [90]:
```
1+2+3+4
```

Out[90]: 10

In [91]:
```
((1+2)+3)+4
```

Out[91]: 10

In [92]:
```
True and True and True and False
```

Out[92]: False

In [93]:
```
((True and True) and True) and False
```

Out[93]: False

In [94]:
```
(True and True) and False
```

Out[94]: False

In [95]:
```
True and False
```

Out[95]: False

In [97]:
```
4 > 2
```

Out[97]: True

In [98]:
```
4 < 2
```

Out[98]: False

In [99]:
```
4 > 2 or 5>5
```

Out[99]: True

In [112]:
```
x=200

x>100 and x<200
```

Out[112]: False

In [ ]:
```

```

In [113]:
```
x=1000000

x<100 or x>200
```

Out[113]: True

In [114]:
```
x=150

not (x<100 or x>200)
```

Out[114]: True

In [115]:
```
x>100
```

Out[115]: True

In [110]:
```
not True
```

Out[110]: False

In [111]:
```
not False
```

Out[111]: True

In [116]:
```
'Mitsos' or 'Kwstas'
```

Out[116]: 'Mitsos'

In [117]:
```
str(5)
```

Out[117]: '5'

In [118]:
```
int('55')
```

Out[118]: 55

In [119]:
```
bool(True)
```

Out[119]: True

In [120]:
```
bool('Mitsos')
```
Out[120]: True

In [121]:
```
bool('')
```
Out[121]: False

In [122]:
```
'' or False
```
Out[122]: False

In [123]:
```
bool(555)
```
Out[123]: True

In [124]:
```
bool(0)
```
Out[124]: False

In [125]:
```
bool(0.00000000000000000000000000001)
```
Out[125]: True

In [126]:
```
bool(0.0)
```
Out[126]: False

In [128]:
```
True + 2
```
Out[128]: 3

In [130]:
```
False + False
```
Out[130]: 0

In [131]:
```
True + True + False
```
Out[131]: 2

In [133]:
```
True / (True + True)
```
Out[133]: 0.5

In [135]:
```
bool('' or 5)
```
Out[135]: True

In [136]:
```
bool(0.0 and 5)
```
Out[136]: False

In [137]:
```
int(True)
```
Out[137]: 1

In [138]:
```
int(False)
```
Out[138]: 0

Λίστες

In [139]:
```
a = [3,5,'mitsos']
```

In [140]:
```
a
```

Out[140]:
```
[3, 5, 'mitsos']
```

In [141]:
```
len(a)
```

Out[141]:
```
3
```

In [142]:
```
len('mitsos')
```

Out[142]:
```
6
```

In [144]:
```
len([])
```

Out[144]:
```
0
```

In [145]:
```
len('')
```

Out[145]:
```
0
```

In [146]:
```
bool([])
```

Out[146]:
```
False
```

In [147]:
```
bool([1,2,5])
```

Out[147]:
```
True
```

In [148]:
```
a = [1,2,3]
b = [7,8,9]
```

In [150]:
```
c = a+b
```

In [151]:
```
c
```

Out[151]:
```
[1, 2, 3, 7, 8, 9]
```

In [153]:
```
c[0]
```

Out[153]:
```
1
```

In [154]:
```
a = 'mitsos'
```

In [155]:
```
a[0]
```

Out[155]:
```
'm'
```

In [157]:
```
c[-1]
```

Out[157]:
```
9
```

In [158]:
```
c
```

Out[158]:
```
[1, 2, 3, 7, 8, 9]
```

In [159]:
```
c[1:-1]
```

Out[159]:
```
[2, 3, 7, 8]
```

In [160]:
```
c[-1:0:-1]
```

Out[160]:
```
[9, 8, 7, 3, 2]
```

In [161]:
```
c
```

Out[161]:
```
[1, 2, 3, 7, 8, 9]
```

In [162]:
```
'mitsos' * 4
```

Out[162]:
```
'mitsosmitsosmitsosmitsos'
```

In [163]:
```
[5,3,7] * 4
```

Out[163]:
```
[5, 3, 7, 5, 3, 7, 5, 3, 7, 5, 3, 7]
```

In [164]:
```
a = [4,5,6]
a.append(9)
print (a)
```

```
[4, 5, 6, 9]
```

In [167]:
```
a = [4,5,6]
a = [9] + a
print (a)
```

```
[9, 4, 5, 6]
```

In [168]:
```
a
```

Out[168]:
```
[9, 4, 5, 6]
```

In [169]:
```
a += [10] # a = a + [10]
```

In [170]:
```
print (a)
```

```
[9, 4, 5, 6, 10]
```

In [171]:
```
[10]
```

Out[171]:
```
[10]
```

In [172]:
```
[]
```

Out[172]:
```
[]
```

In [173]:
```
[1,2,3]
```

Out[173]:
```
[1, 2, 3]
```

In [174]:
```
a
```

Out[174]:
```
[9, 4, 5, 6, 10]
```

In [180]:
```
a = a[:3] + [20] + a[3:]
```

In [181]:
```
print (a)
```

```
[9, 4, 5, 20, 6, 10]
```

In [183]:
```
'hello my name is alex'.split()
```

Out[183]:
```
['hello', 'my', 'name', 'is', 'alex']
```

In [184]:
```
'hello          my       name    is     alex    '.split()
```

Out[184]:
```
['hello', 'my', 'name', 'is', 'alex']
```

In [185]:
```
a = ['hello', 'my', 'name', 'is', 'alex']
```

In [186]:
```
' '.join(a)
```

Out[186]:
```
'hello my name is alex'
```

In [187]:
```
'+'.join(a)
```

Out[187]:
```
'hello+my+name+is+alex'
```

In [188]:
```
' <--> '.join(a)
```

Out[188]:
```
'hello <--> my <--> name <--> is <--> alex'
```

In [189]:
```
'a+b+c+d'.split('+')
```

Out[189]:
```
['a', 'b', 'c', 'd']
```

In [190]:
```
'hello          my       name    is     alex    '.split(' ')
```

Out[190]:
```
['hello',
 '',
 '',
 '',
 '',
 '',
 '',
 '',
 '',
 '',
 '',
 'my',
 '',
 '',
 '',
 '',
 '',
 '',
 '',
 'name',
 '',
 '',
 '',
 '',
 'is',
 '',
 '',
 '',
 '',
 '',
 'alex',
 '',
 '',
 '',
 '',
 '']
```

In [191]:
```
'hello my name is alex'.split(' ')
```

Out[191]:
```
['hello', 'my', 'name', 'is', 'alex']
```

WHITESPACE: https://en.wikipedia.org/wiki/Whitespace_character (https://en.wikipedia.org/wiki/Whitespace_character)

In [193]:
```
''.join( ['hello', 'world']   )
```

Out[193]:
```
'helloworld'
```

In [194]:
```
' '.join( ['hello', 'world']   )
```

Out[194]:
```
'hello world'
```

In [195]:
```
' <--> '.join( ['hello', 'world']   )
```

Out[195]:
```
'hello <--> world'
```

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

Out[196]:
```
0
```

In [198]:
```
len(  [ [] ]  )
```

Out[198]:
```
1
```

In [199]:
```
a = [1,2,4, 'mitsos', [], 6]
```

In [202]:
```
len(a)
```

Out[202]: 6

In [204]:
```
a= [  [1,2,3], [6,7,8]  ]
len(a)
```

Out[204]: 2

In [205]:
```
a
```

Out[205]: [[1, 2, 3], [6, 7, 8]]

In [207]:
```
a[0]
```

Out[207]: [1, 2, 3]

In [208]:
```
a[1]
```

Out[208]: [6, 7, 8]

In [209]:
```
a = [  [1,2,3],  [5, [6,7, [6,15]] ], 6  ]
```

In [211]:
```
len(a)
```

Out[211]: 3

In [212]:
```
a[1]
```

Out[212]: [5, [6, 7, [6, 15]]]

In [214]:
```
a[1][1]
```

Out[214]: [6, 7, [6, 15]]

In [216]:
```
a[1][1][2]
```

Out[216]: [6, 15]

In [217]:
```
a[1][1][2][0]
```

Out[217]: 6

In [219]:
```
a
```

Out[219]: [[1, 2, 3], [5, [6, 7, [6, 15]]], 6]

In [223]:
```
a[1][1][2][0] = 20
```

In [224]:
```
a
```

Out[224]: [[1, 2, 3], [5, [6, 7, [20, 15]]], 6]

In [227]:
```
3 == 5-2
```

Out[227]: True

In [229]:
```
a=3
b=3
a==b
```

Out[229]: True

== , τσεκάρει αν το αριστερό και δεξιό τμήμα έχουν την ίδια τιμη

In [233]:
```
a==3
```

Out[233]: False

In [231]:
```
a+=2
```

In [232]:
```
print (a)
```

```
5
```

In [236]:
```
a=3
b = a==3

a+=5

print (b)
```

```
True
```

In [240]:
```
a=3

b = a==3
print (b)

a+=5

b = a==3
print (b)
```

```
True
False
```

In [241]:
```
'mitsos' == 'mitsos'
```

Out[241]: True

In [242]:
```
'mitsos' == 'Mitsos'
```

Out[242]: False

In [243]:
```
'mitsos' == 'Mitsos'.lower()
```

Out[243]: True

In [245]:
```
[2,3] == [2,4-1]
```

Out[245]: True

In [247]:
```
[2,3] == [3,2]
```

Out[247]: False

In [248]:
```
[] == []
```
Out[248]: True

In [249]:
```
[2,3] == [3,2][::-1]
```
Out[249]: True

In [251]:
```
'Mitsos'[::-1]
```
Out[251]: 'sostiM'

In [253]:
```
15 != 10
```
Out[253]: True

In [254]:
```
a = [[1, 2, 3], [5, [6, 7, [20, 15]]], 6]
```

In [255]:
```
int('5')
```
Out[255]: 5

In [257]:
```
type(3)
```
Out[257]: int

In [258]:
```
type(5.5)
```
Out[258]: float

In [259]:
```
type('asdfasdf')
```
Out[259]: str

In [260]:
```
type([5,6,7])
```
Out[260]: list

In [261]:
```
type(True)
```
Out[261]: bool

In [262]:
```
a
```
Out[262]: [[1, 2, 3], [5, [6, 7, [20, 15]]], 6]

In [263]:
```
type(a) is list
```
Out[263]: True

In [264]:
```
type(a[0]) is list
```
Out[264]: True

In [265]:
```
type(a[-1]) is list
```
Out[265]: False

In [266]:
```
a = [3,4,5]
```

In [267]:
```
a.append(9)
```

In [268]:
```
print (a)
```

```
[3, 4, 5, 9]
```

In [269]:
```
type(a) == list
```

Out[269]:
```
True
```

In [271]:
```
a.extend([10])
```

In [272]:
```
a
```

Out[272]:
```
[3, 4, 5, 9, 10]
```

In [273]:
```
# APPEND
a = [3,4,5]
a.append(   6   )
print (a)

a = [3,4,5]
a += [6] # a= a + [6]
print (a)
```

```
[3, 4, 5, 6]
[3, 4, 5, 6]
```

In [274]:
```
# EXTEND

a = [3,4,5]
a.extend(   [6,7,8]   )
print (a)

a = [3,4,5]
a += [6,7,8]
print (a)
```

```
[3, 4, 5, 6, 7, 8]
[3, 4, 5, 6, 7, 8]
```

In [275]:
```
a = [3,4,5]
a.append( [6,7,8] )
print (a)


a = [3,4,5]
a.extend( [6,7,8] )
print (a)
```

```
[3, 4, 5, [6, 7, 8]]
[3, 4, 5, 6, 7, 8]
```

In [276]:
```
[3,4,5] + [6,7,8]
```

Out[276]:
```
[3, 4, 5, 6, 7, 8]
```

In [277]:
```
[3,4,5] + [[6,7,8]]
```

Out[277]:
```
[3, 4, 5, [6, 7, 8]]
```

In [ ]:

In [278]:
```
a = [1,2,3]
a.extend([5,6])
print (a)
```

```
[1, 2, 3, 5, 6]
```

In [279]:
```
a = [1,2,3]
a.append(5)
a.append(6)
print (a)
```

```
[1, 2, 3, 5, 6]
```

In [280]:
```
# DIAFORES LISTES ME STRING!
```

In [282]:
```
a = [1,2,3]
a[1] = 15
print(a)
```

```
[1, 15, 3]
```

In [284]:
```
a = 'Mitsos'
a[1] = 'X'
print (a)
```

```
---------------------------------------------------------------------------
TypeError                                 Traceback (most recent call last)
<ipython-input-284-6499dd721f1a> in <module>()
      1 a = 'Mitsos'
----> 2 a[1] = 'X'
      3 print (a)

TypeError: 'str' object does not support item assignment
```

In [285]:
```
a[:1] + 'X' + a[2:]
```

Out[285]:
```
'MXtsos'
```

In [296]:
```
a = 'Mitsos'
b = a
a = b + ' 123'
#b = a
print (b)
```

```
Mitsos
```

In [297]:
```
id(a)
```

Out[297]:
```
4397792112
```

In [298]:
```
id(b)
```

Out[298]:
```
4397693392
```

In [ ]:

In [299]:
```
a = [1,2,3]
b = a
a += [6,7,8]
print (b)
```

```
[1, 2, 3, 6, 7, 8]
```

In [300]:
```
id(a)
```

Out[300]:
```
4397824904
```

In [301]:
```
id (b)
```

Out[301]:
```
4397824904
```

In [302]:
```
a is b
```

Out[302]:
```
True
```

In [318]:
```
a = [1]* 1000000
```

In [319]:
```
b = a
```

In [320]:
```
a = 'K' * 1000000
```

In [321]:
```
b=a
```

In [322]:
```
c=b
```

In [ ]:

In [ ]:

In [290]:
```
rs()
```

Out[290]:
```
'Iwanna'
```

In [310]:
```
a = 10000
b = 10000
```

In [311]:
```
a == b
```

Out[311]:
```
True
```

In [312]:
```
a is b
```

Out[312]:
```
False
```

In [313]:
```
a = [1,2,3]
b = a
```

In [314]:
```
a is b
```

Out[314]:
```
True
```

In [315]:
```
a += [6]
```

In [316]:
```
print (b)
```
```
[1, 2, 3, 6]
```

In [317]:
```
id(a) == id(b)
```
Out[317]:
```
True
```

In [326]:
```
a = 'mitsos'
```

In [327]:
```
id(a)
```
Out[327]:
```
4397705176
```

In [328]:
```
a = a + ' llll'
```

In [329]:
```
id(a)
```
Out[329]:
```
4397828272
```

In [330]:
```
a = [1,2,3]
```

In [331]:
```
id(a)
```
Out[331]:
```
4397790856
```

In [332]:
```
a = a + [6,7,8]
```

In [334]:
```
id(a)
```
Out[334]:
```
4397853512
```

In [339]:
```
a = [1,2,3]
```

In [336]:
```
id(a)
```
Out[336]:
```
4397828488
```

In [337]:
```
a.append(10)
```

In [338]:
```
id(a)
```
Out[338]:
```
4397828488
```

In [340]:
```
None
```

In [341]:
```
όνομα = 'Μήτσος'
```

In [342]:
```
print (όνομα)
```
```
Μήτσος
```

In [ ]:

In [ ]:

In [ ]:

In [ ]:

In [ ]:

In [ ]:

In [ ]:

In [226]:
```
rs()
```

Out[226]:
```
'Tzwrtzina'
```

In [ ]:

In [ ]:

In [ ]:

In [ ]:
```
1 + 2
```