

```
In [5]: print ("Γεια σας")
```

Γεια σας

Η [python \(https://www.python.org/\)](https://www.python.org/) είναι **φανταστική**

- ένα
- δύο

ΚΕΦΑΛΑΙΟ 1

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Week 1: Εισαγωγή στη python, γιατί python; anaconda installation, περιβάλλον ανάπτυξης jupyter, markdown, social coding, primitive data types and operations, strings, boolean logic, slicing Week 2: Lists, tuples, for, while, if_then_else, continue, break. Whitespaces for indentation Week 3: List comprehensions Week 4: functions, variable scope, map/reduce, functional programming, recursive functions Week 5: Dictionaries, complex data types, dictionary comprehensions, sets, set comprehensions Week 6: Sorting, Counting, Filtering, lambda functions, generators, generator comprehensions Week 7: Working with files, JSON, data serialization Week 8: Regular expressions, Exceptions Week 9: Import, unpacking variables, the “is” operator, ternary operator, default dictionaries Week 10: numpy Week 11: Data visualization, interactive plots, matplotlib, bokeh, seaborn Week 12: pandas with real data examples from GWAS catalogue Week 13: Object Oriented Programming: Classes, Inheritance, Initializers, member functions, static/class functions.

- 5 Σειρές ασκήσεων: 50%
- 1 project ATOMIKO: 50%

```
In [6]: students=[
        'Ελσα',
        'Αιμίλιος',
        'Αθανασία',
        'Νίκος',
        'Δανάη',
        'Ιπποκράτης',
        'Ελενα',
        'Πολίνα',
        'Γιάννης',
        'Κλάρα',
        'Αρτεμης',
        ]
```

```
In [9]: import random
def pick():
    return random.choice(students)
```

```
In [15]: pick()
```

```
Out[15]: 'Αιμίλιος'
```

```
In [12]: 1+1
```

```
Out[12]: 2
```

```
In [17]: 1+0.0
```

```
Out[17]: 1.0
```

```
In [19]: 134957024852370948572039457802394857 + 2329847569283465923847659238476592384765
          92384765923874652938746529387465
```

```
Out[19]: 232984756928346592384765923847659238611549409618294823224978204331782322
```

```
In [21]: 2345232452345234.523452345245
```

```
Out[21]: 2345232452345234.5
```

```
In [22]: pick()
```

```
Out[22]: 'Αρτεμις'
```

```
In [23]: 5/2
```

```
Out[23]: 2.5
```

```
In [24]: 4/2
```

```
Out[24]: 2.0
```

```
In [25]: 5//2
```

```
Out[25]: 2
```

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

```
Out[26]: 'Ιπποκράτης'
```

```
In [27]: 'mitsos'
```

```
Out[27]: 'mitsos'
```

```
In [28]: '1'
```

```
Out[28]: '1'
```

```
In [29]: 1
```

```
Out[29]: 1
```

```
In [30]: 1+2
```

```
Out[30]: 3
```

```
In [31]: '1' + '2'
```

```
Out[31]: '12'
```

```
In [32]: '1' + 2
```

```
-----
TypeError                                Traceback (most recent call last)
<ipython-input-32-20b2518fe802> in <module>()
----> 1 '1' + 2
```

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

```
In [33]: 2 * 3
```

```
Out[33]: 6
```

```
In [34]: '2' * 3
```

```
Out[34]: '222'
```

```
In [36]: '2' + '2' + '2'
```

```
Out[36]: '222'
```

```
In [37]: 'ل عدد ... ضنع النطاق تحت عنوان'
```

```
Out[37]: 'ل عدد ... ضنع النطاق تحت عنوان'
```

```
In [38]: '''
z.dskjgflz kdfjg zvz \g

dfg sdfg sdfgsd
fg
sdfg
sd fg
sdfg
sd
gsd f
gs df
'''
```

```
Out[38]: '\nz.dskjgflz kdfjg zvz \g\n\ndfg sdfg sdfgsd \nfg \nsdfg\nsd fg\nsdfg\nsd\nng
sd f\ngs df \n'
```

```
In [40]: print ('''
z.dskjgflz kdfjg zvz \g

dfg sdfg sdfgsd
fg
sdfg
sd fg
sdfg
sd
gsd f
gs df
''')
```

```
z.dskjgflz kdfjg zvz \g

dfg sdfg sdfgsd
fg
sdfg
sd fg
sdfg
sd
gsd f
gs df
```

```
In [42]: ''' asdfas dfas df asdf sa df asdf '''
```

```
Out[42]: ' asdfas dfas df asdf sa df asdf '
```

```
In [43]: """ asdf asdf asdf asdf adsf """
```

```
Out[43]: ' asdf asdf asdf asdf adsf '
```

```
In [45]: 'mitsos' 'kostas'
```

```
Out[45]: 'mitsoskostas'
```

```
In [47]: len('mitsos')
```

```
Out[47]: 6
```

```
In [51]: len('abc' * 2)
```

```
Out[51]: 6
```

```
In [48]: pick()
```

```
Out[48]: 'Κλάρα'
```

```
In [52]: 'mitsos'.count('s')
```

```
Out[52]: 2
```

```
In [53]: 'mitsos'.upper()
```

```
Out[53]: 'MITSOS'
```

```
In [54]: 'Μήτσος'.upper()
```

```
Out[54]: 'ΜΗΤΣΟΣ'
```

```
In [55]: 'ΜΗΤΣΟΣ'.lower()
```

```
Out[55]: 'μήτσος'
```

```
In [57]: 'Μήτσος'[0]
```

```
Out[57]: 'Μ'
```

```
In [60]: 'Μήτσος'[1]
```

```
Out[60]: 'ή'
```

```
In [62]: 'Μήτσος'[5]
```

```
Out[62]: 'ς'
```

```
In [63]: pick()
```

```
Out[63]: 'Αρτεμης'
```

```
In [64]: 'Μήτσος'[6]
```

```
-----
IndexError                                Traceback (most recent call last)
<ipython-input-64-762d8a90fd39> in <module>()
----> 1 'Μήτσος'[6]

IndexError: string index out of range
```

```
In [66]: 'Μήτσος'[-1]
```

```
Out[66]: 'ς'
```

```
In [67]: pick()
```

```
Out[67]: 'Αθανασία'
```

```
In [68]: 'Μήτσος'[-2]
```

```
Out[68]: 'ο'
```

```
In [69]: 'Μήτσος'[-6]
```

```
Out[69]: 'Μ'
```

```
In [71]: 'Μήτσος'[1:3]
```

```
Out[71]: 'ήτ'
```

```
In [73]: 'Μήτσος'[1:2]
```

```
Out[73]: 'ή'
```

```
In [76]: pick()
```

```
Out[76]: 'Κλάρα'
```

```
In [75]: 'Μήτσος'[1:1]
```

```
Out[75]: ''
```

```
In [77]: len('')
```

```
Out[77]: 0
```

```
In [79]: '' * 10
```

```
Out[79]: ''
```

```
In [80]: pick()
```

```
Out[80]: 'Αιμίλιος'
```

```
In [84]: len('   ')
```

```
Out[84]: 3
```

```
In [86]: len('Hello World')
```

```
Out[86]: 11
```

```
In [88]: 'Mitsos'[2:4]
```

```
Out[88]: 'ts'
```

```
In [95]: pick()
```

```
Out[95]: 'Πολίνα'
```

```
In [93]: 'Mitsos'[:-1]
```

```
Out[93]: 'Mitso'
```

```
In [94]: 'Mitsos'[2:]
```

```
Out[94]: 'tsos'
```

```
In [99]: 'mitsos'[0].upper() + 'itsos'
```

```
Out[99]: 'Mitsos'
```

```
In [102]: a = 'alexandros'
```

```
In [104]: a[0:1].upper() + a[1:]
```

```
Out[104]: 'Alexandros'
```

```
In [110]: 'Mitsos'[1:5:2]
```

```
Out[110]: 'is'
```

```
In [114]: 'Mitsos'[-1:1:-1]
```

```
Out[114]: 'sost'
```

```
In [115]: 'abcdefghijkl'[1:7:2]
```

```
Out[115]: 'bdf'
```

```
In [ ]: 'abcdefghijkl'[1:7:2]
```

```
In [118]: 'Mitsos'[-1:0:-1]
```

```
Out[118]: 'sosti'
```

```
In [119]: 'Mitsos'[-1::-1]
```

```
Out[119]: 'sostiM'
```

```
In [120]: 'Mitsos'[::-1]
```

```
Out[120]: 'sostiM'
```

```
In [123]: 'abcdefghijkl'[7:1:-2]
```

```
Out[123]: 'hfd'
```

```
In [130]: pick()
```

```
Out[130]: 'Δανάη'
```

```
In [125]: True
```

```
Out[125]: True
```

```
In [126]: False
```

```
Out[126]: False
```

```
In [128]: True + 5
```

```
Out[128]: 6
```

```
In [129]: False + 5
```

```
Out[129]: 5
```

```
In [131]: True + True
```

```
Out[131]: 2
```

```
In [132]: True + False + True
```

```
Out[132]: 2
```

```
In [134]: True and True
```

```
Out[134]: True
```

```
In [135]: True and False
```

```
Out[135]: False
```

```
In [136]: False and True
```

```
Out[136]: False
```

```
In [137]: False and False
```

```
Out[137]: False
```

```
In [138]: True or True
```

```
Out[138]: True
```

```
In [139]: True or False
```

```
Out[139]: True
```

```
In [140]: False or True
```

```
Out[140]: True
```

```
In [141]: False or False
```

```
Out[141]: False
```

```
In [147]: bool(True and 'Mitsos')
```

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

```
In [148]: bool(True and '')
```

```
Out[148]: False
```

```
In [149]: bool(True and ' ')
```

```
Out[149]: True
```

```
In [150]: bool(True and 6)
```

```
Out[150]: True
```

```
In [151]: bool(True and 0)
```

```
Out[151]: False
```

```
In [152]: bool(True and -1)
```

Out[152]: True

```
In [153]: bool(True and 5.6)
```

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

```
In [154]: bool(True and 0.0)
```

```
Out[154]: False
```

[illegible]

Out[155]: True

```
In [156]: 3>5
```

```
Out[156]: False
```

```
In [157]: 3>=3
```

```
Out[157]: True
```

```
In [161]: bool('')
```

Out[161]: True

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

```
Out[144]: 'Κλάρα'
```

```
In [162]: True or 5.5
```

Out[162]: True

```
In [163]: True and 5.5
```

Out[163]: 5.5

```
In [165]: 5.5 or True
```

Out[165]: 5.5

```
In [166]: True and 0.0
```

```
Out[166]: 0.0
```

```
In [167]: 0 or ' ' or 'mitsos' or 7
```

```
Out[167]: 'mitsos'
```

```
In [171]: 0 or ' ' or 'mitsos' or ''
```

```
Out[171]: 'mitsos'
```

```
In [175]: 0 or '' or 7 or False
```

Out[175]: 7


```
In [178]: 1 and True and mitsos
```

```
-----
NameError                                Traceback (most recent call last)
<ipython-input-178-b1cde7f3d649> in <module>()
----> 1 1 and True and mitsos

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

```
In [179]: a=3
```

```
In [181]: a+4
```

```
Out[181]: 7
```

```
In [182]: b=True
```

```
In [183]: a + b
```

```
Out[183]: 4
```

```
In [184]: mitsos = 'kwstas'
```

```
In [186]: mitsos + 'mitsos'
```

```
Out[186]: 'kwstasmitsos'
```

```
In [187]: a
```

```
Out[187]: 3
```

```
In [188]: pick()
```

```
Out[188]: 'Πιόννης'
```

```
In [189]: a = a + 1
```

```
In [190]: a
```

```
Out[190]: 4
```

```
In [193]: a+=1 # a=a+1
```

```
In [194]: a
```

```
Out[194]: 6
```

```
In [196]: # asdhjfgashdfg kasdf gksdfg asjdfg aksdjfg kajdhfg
```

```
In [197]: a++
```

```
File "<ipython-input-197-22e3d6dc1353>", line 1
    a++
    ^
SyntaxError: invalid syntax
```

```
In [199]: a+=1
```

```
In [200]: a
```

```
Out[200]: 7
```

```
In [202]: t = 'hello'
```

```
In [203]: t = 5
```

```
In [204]: t= False
```

```
In [205]: t+t
```

```
Out[205]: 0
```

```
In [206]: def f(i):  
           return i*3
```

```
In [208]: f('mitsos')
```

```
Out[208]: 'mitsosmitsosmitsos'
```

```
In [212]: int('42')
```

```
Out[212]: 42
```

```
In [213]: str(42)
```

```
Out[213]: '42'
```

```
In [214]: int('mitsos')
```

```
-----  
ValueError                                Traceback (most recent call last)  
<ipython-input-214-24e8b5b4a1dd> in <module>()  
----> 1 int('mitsos')  
  
ValueError: invalid literal for int() with base 10: 'mitsos'
```

```
In [218]: float(5)
```

```
Out[218]: 5.0
```

```
In [219]: float(True)
```

```
Out[219]: 1.0
```

```
In [221]: int('43')
```

```
Out[221]: 43
```

```
In [222]: int(43)
```

```
Out[222]: 43
```

```
In [223]: int(True)
```

```
Out[223]: 1
```

```
In [224]: int(False)
```

```
Out[224]: 0
```

```
In [226]: int(5.3)
```

```
Out[226]: 5
```

```
In [227]: int('55')
```

```
Out[227]: 55
```

```
In [231]: float(True)
```

```
Out[231]: 1.0
```

```
In [232]: float('5.6')
```

```
Out[232]: 5.6
```

```
In [233]: bool('Mitsos')
```

```
Out[233]: True
```

```
In [234]: bool('')
```

```
Out[234]: False
```

```
In [235]: str(42)
```

```
Out[235]: '42'
```

```
In [236]: str(4.6)
```

```
Out[236]: '4.6'
```

```
In [237]: str(4.6) + 'Mitsos'
```

```
Out[237]: '4.6Mitsos'
```

```
In [238]: str(True)
```

```
Out[238]: 'True'
```

```
In [239]: None
```

```
In [240]: str(None)
```

```
Out[240]: 'None'
```

```
In [241]: int(None)
```

```
-----  
TypeError                                 Traceback (most recent call last)  
<ipython-input-241-af2123a46eb2> in <module>()  
----> 1 int(None)
```

```
TypeError: int() argument must be a string, a bytes-like object or a number, not 'NoneType'
```

In [242]: `str(4.6) + 7`

```
-----  
TypeError                                 Traceback (most recent call last)  
<ipython-input-242-04fa0ff958b2> in <module>()  
----> 1 str(4.6) + 7  
  
TypeError: can only concatenate str (not "int") to str
```

In [243]: `4.6 + 7`

Out[243]: 11.6