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

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

In [2]:
```
a = [4,5,6,7]
for x in a:
    print (x+1)
```

```
5
6
7
8
```

In [3]:
```
i = 0
while i<len(a):
    print (a[i]+1)
    i += 1
```

```
5
6
7
8
```

In [4]:
```
a=5
if a == 5:
    print ("hello")
```

```
hello
```

In [5]:
```
while a==5:
    print ("hello")
    break
```

```
hello
```

In [3]:
```
# 1000
# +7%

x= 1000
c = 0
while x<2000:
    c += 1
    x = x + 0.07*x
#print(x)
print (c)
```

```
11
```

In [4]:
```
x= 1000
c = 0
while True:
    c += 1
    x = x + 0.07*x

    if x > 2000:
        break
#print(x)
print (c)
```

```
11
```

In [5]:
```
x = 1000
while True:
    x = x + 0.07*x
    if x>2000:
        break
```

In [8]:
```
a = 0
while a<10:
    a += 1
    if a%2 == 1:
        continue
    print (a)
```

```
2
4
6
8
10
```

In [10]:
```
a = -1
while a<10:
    a += 1
    if a%2 == 1:
        continue
    print (a)
```

```
0
2
4
6
8
10
```

In [19]:
```
def prime(n):
    i = 2
    while i<n:
        if n%i != 0:
            i += 1
            continue
            #return True

        else:
            return False
    return True
```

In [21]:
```
for x in range(20, 41):
    print (x, prime(x))
```

```
20 False
21 False
22 False
23 True
24 False
25 False
26 False
27 False
28 False
29 True
30 False
31 True
32 False
33 False
34 False
35 False
36 False
37 True
38 False
39 False
40 False
```

In [22]:
```python
def prime_2(n):
    for i in range(2, n):
        if n%i == 0:
            return False
    return True
```

In [24]:
```python
for x in range(20, 41):
    print (x, prime_2(x))
```

```
20 False
21 False
22 False
23 True
24 False
25 False
26 False
27 False
28 False
29 True
30 False
31 True
32 False
33 False
34 False
35 False
36 False
37 True
38 False
39 False
40 False
```

In [34]:
```python
def prime_3(n):
    for i in range(2, n):
        if n%i == 0:
            break
    #print (i)
    return i == n-1
```

In [35]:
```python
for x in range(20, 41):
    print (x, prime_3(x))
```

```
20 False
21 False
22 False
23 True
24 False
25 False
26 False
27 False
28 False
29 True
30 False
31 True
32 False
33 False
34 False
35 False
36 False
37 True
38 False
39 False
40 False
```

In [39]:
```python
def prime_4(n):

    exw_kanei_break = False
    for i in range(2, n):
        if n%i == 0:
            exw_kanei_break = True
            break


    return not exw_kanei_break
```

In [40]:
```python
for x in range(20, 41):
    print (x, prime_4(x))
```

```
20 False
21 False
22 False
23 True
24 False
25 False
26 False
27 False
28 False
29 True
30 False
31 True
32 False
33 False
34 False
35 False
36 False
37 True
38 False
39 False
40 False
```

In [42]:
```
def prime_5(n):


    for i in range(2, n):
        if n%i == 0:
            break
    else:
        return True

    return False
```

In [45]:
```
for x in range(20, 41):
    print (x, prime_5(x))
```

```
20 False
21 False
22 False
23 True
24 False
25 False
26 False
27 False
28 False
29 True
30 False
31 True
32 False
33 False
34 False
35 False
36 False
37 True
38 False
39 False
40 False
```

In [56]:
```
def prime_6(n):

    def f(x):
        return n%x

    l = list(range(2,n))
    #print (l)
    k = list(map(f,l))
    #print (k)

    return not (0 in k)
```

In [57]:
```
for x in range(20, 41):
    print (x, prime_6(x))
```

```
20 False
21 False
22 False
23 True
24 False
25 False
26 False
27 False
28 False
29 True
30 False
31 True
```

```
32 False
33 False
34 False
35 False
36 False
37 True
38 False
39 False
40 False
```

In [52]:
```
5 in [6,5,7]
```

Out[52]:
```
True
```

In [58]:
```
a = [4,5,6]
```

In [59]:
```
b = (4,5,6)
```

In [60]:
```
a[1] = 100
```

In [61]:
```
b[1] = 100
```

```
---------------------------------------------------------------------------
TypeError                                 Traceback (most recent call last)
<ipython-input-61-d2a3b3af180f> in <module>
----> 1 b[1] = 100

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

In [62]:
```
def f(x):
    return x-1, x+1
```

In [63]:
```
f(5)
```

Out[63]:
```
(4, 6)
```

In [64]:
```
type('mitsso')
```

Out[64]:
```
str
```

In [65]:
```
type(33)
```

Out[65]:
```
int
```

In [66]:
```
type([4,5,6])
```

Out[66]:
```
list
```

In [67]:
```
type((5,6,7))
```

Out[67]:
```
tuple
```

In [68]:
```
[5]
```

Out[68]:
```
[5]
```

In [69]:
```
(6)
```

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

In [70]:
```
(6,)
```

Out[70]: (6,)

In [71]:
```
6,
```

Out[71]: (6,)

In [72]:
```
6,7,8,9
```

Out[72]: (6, 7, 8, 9)

In [80]:
```
a=list(range(1,100_000_000))
```

In [81]:
```
99_987_344 in a
```

Out[81]: True

In [82]:
```
'mitsos' in a
```

Out[82]: False

dictionary

In [83]:
```
a={
    1 : "BRCA2",
    2 : "P53",
    3 : "APOE",
}
```

In [84]:
```
2 in a
```

Out[84]: True

In [85]:
```
a[2]
```

Out[85]: 'P53'

In [86]:
```
b={
    "BRCA2" : 1,
    "P53" : 70,
    "APOE": 88,
}
```

In [87]:
```
b['P53']
```

Out[87]: 70

In [88]:
```
b.values()
```

Out[88]: dict_values([1, 70, 88])

In [89]:
```
b.keys()
```

Out[89]:
```
dict_keys(['BRCA2', 'P53', 'APOE'])
```

In [90]:
```
b
```

Out[90]:
```
{'BRCA2': 1, 'P53': 70, 'APOE': 88}
```

In [91]:
```
b['mitsos'] = [4,5,6]
```

In [92]:
```
b['mitsos'] = {"5": "ASDSWD"}
```

In [93]:
```
def f(x):
    return x+1
```

In [94]:
```
b['my_fabulous_f'] = f
```

In [95]:
```
b['my_fabulous_f'](60)
```

Out[95]:
```
61
```

In [96]:
```
b
```

Out[96]:
```
{'BRCA2': 1,
 'P53': 70,
 'APOE': 88,
 'mitsos': {'5': 'ASDSWD'},
 'my_fabulous_f': <function __main__.f(x)>}
```

In [97]:
```
b[4] = "mitsos"
```

In [98]:
```
b['mitsos'] = 'mitsos'
```

In [99]:
```
b[True] = 'mitsos'
```

In [100…
```
b[6.66] = 'mitsos'
```

In [101…
```
b[ [5,6] ] = 'mitsos'
```

```
---------------------------------------------------------------------------
TypeError                                 Traceback (most recent call last)
<ipython-input-101-8fd87e8553e5> in <module>
----> 1 b[ [5,6] ] = 'mitsos'

TypeError: unhashable type: 'list'
```

In [104…
```
hash('mitsos123')
```

Out[104…
```
-5477650241974683608
```

In [105…
```
hash('mitsos123')
```

Out[105…
```
-5477650241974683608
```

In [108…
```
b['P53']
```

Out[108…
```
70
```

In [109…
```
b['P53'] += 1
```

In [110…
```
b['P53']
```

Out[110… 71

In [111…
```
b
```

Out[111…
```
{'BRCA2': 1,
 'P53': 71,
 'APOE': 88,
 'mitsos': 'mitsos',
 'my_fabulous_f': <function __main__.f(x)>,
 4: 'mitsos',
 True: 'mitsos',
 6.66: 'mitsos'}
```

In [112…
```
del b['P53']
```

In [113…
```
b
```

Out[113…
```
{'BRCA2': 1,
 'APOE': 88,
 'mitsos': 'mitsos',
 'my_fabulous_f': <function __main__.f(x)>,
 4: 'mitsos',
 True: 'mitsos',
 6.66: 'mitsos'}
```

In [114…
```
b['P53'] = 50
```

In [115…
```
b['P53'] + 50
```

Out[115… 100

In [117…
```
b['QQQ'] = b['P53']
```

In [118…
```
b
```

Out[118…
```
{'BRCA2': 1,
 'APOE': 88,
 'mitsos': 'mitsos',
 'my_fabulous_f': <function __main__.f(x)>,
 4: 'mitsos',
 True: 'mitsos',
 6.66: 'mitsos',
 'P53': 50,
 'QQQ': 50}
```

In [119…
```
'P53' in b
```

Out[119… True

In [120…
```
'XYZ' in b
```

Out[120… False

In [122…
```
1 in b.values()
```

Out[122… True

In [123…
```
2 in b.values()
```

Out[123… False

In [129…
```
c = {'a': 1, 'b':3, 'c': 2,}

for a,b in c.items():
    print (a,b)
```

```
a 1
b 3
c 2
```

In [133…
```
d = {}
for a,b in c.items():
    d[b]=a
print (d)
```

```
{1: 'a', 3: 'b', 2: 'c'}
```

In [135…
```
d = {  b:a  for a,b in c.items()  }
print (d)
```

```
{1: 'a', 3: 'b', 2: 'c'}
```

In [131…
```
len(d)
```

Out[131… 3

In [132…
```
len({})
```

Out[132… 0

In [138…
```
c= ['heraklion', 'patras', 'athens']
```

In [140…
```
{k:len(k) for k in  c }
```

Out[140… {'heraklion': 9, 'patras': 6, 'athens': 6}

In [143…
```
d = {'a': 1, 'b':3, 'c': 2,}
```

In [145…
```
list(d.items())
```

Out[145… [('a', 1), ('b', 3), ('c', 2)]

In [146…
```
for a,b in [('a', 1), ('b', 3), ('c', 2)]:  # d.items():
    print (a,b)
```

```
a 1
b 3
c 2
```

In [147…
```
a = [5,6,7]
b = ['a', 'b', 'c']
```

In [151…
```
list(zip(a,b))
```

Out[151… [(5, 'a'), (6, 'b'), (7, 'c')]

In [152…
```
dict(zip(a,b))
```
Out[152…
```
{5: 'a', 6: 'b', 7: 'c'}
```
In [ ]:
```

```
In [150…
```
dict( [ (1,2), (5,6) ]   )
```
Out[150…
```
{1: 2, 5: 6}
```
In [153…
```
a = set()
```
In [154…
```
len(a)
```
Out[154…
```
0
```
In [155…
```
a.add(5)
```
In [156…
```
len(a)
```
Out[156…
```
1
```
In [157…
```
a.add(6)
```
In [158…
```
len(a)
```
Out[158…
```
2
```
In [159…
```
a.add(5)
```
In [160…
```
len(a)
```
Out[160…
```
2
```
In [161…
```
a = set()
```
In [162…
```
a = {1,2,3,4,5}
```
In [163…
```
3 in a
```
Out[163…
```
True
```
In [164…
```
8 in a
```
Out[164…
```
False
```
In [165…
```
a = {1,2,3,4,5}
```
In [166…
```
b = {4,5,6,7,8}
```
In [167…
```
a & b
```
Out[167…
```
{4, 5}
```
In [168…
```
a | b
```

Out[168… {1, 2, 3, 4, 5, 6, 7, 8}

In [169…
```
a - b
```

Out[169… {1, 2, 3}

In [170…
```
b - a
```

Out[170… {6, 7, 8}

In [171…
```
a = set()
for x in range(1,100_000_000):
    a.add(x)
```

In [177…
```
99_432_433 in a
```

Out[177… True

In [178…
```
'mitsos' in a
```

Out[178… False

In [179…
```
100_000_001 in a
```

Out[179… False

In [ ]:

In [174…
```
set(range(6,100))
```

Out[174…
```
{6,
 7,
 8,
 9,
 10,
 11,
 12,
 13,
 14,
 15,
 16,
 17,
 18,
 19,
 20,
 21,
 22,
 23,
 24,
 25,
 26,
 27,
 28,
 29,
 30,
 31,
 32,
 33,
 34,
 35,
```

36,
37,
38,
39,
40,
41,
42,
43,
44,
45,
46,
47,
48,
49,
50,
51,
52,
53,
54,
55,
56,
57,
58,
59,
60,
61,
62,
63,
64,
65,
66,
67,
68,
69,
70,
71,
72,
73,
74,
75,
76,
77,
78,
79,
80,
81,
82,
83,
84,
85,
86,
87,
88,
89,
90,
91,
92,
93,
94,
95,
96,
97,
98,
99}

In [175…
```
set([ 3,4,5,4,5,6,7,6,7,8,9,8,7 ])
```

Out[175…
```
{3, 4, 5, 6, 7, 8, 9}
```

In [176…
```
set('fghdjsiudfygfhrjekfgiuyfhdjskirug7hufreijhrghtjrkdfuyghgufiehg')
```

Out[176…
```
{'7', 'd', 'e', 'f', 'g', 'h', 'i', 'j', 'k', 'r', 's', 't', 'u', 'y'}
```

In [180…
```
[x%5 for x in range(15)]
```

Out[180…
```
[0, 1, 2, 3, 4, 0, 1, 2, 3, 4, 0, 1, 2, 3, 4]
```

In [181…
```
{x:x%5 for x in range(15)}
```

Out[181…
```
{0: 0,
 1: 1,
 2: 2,
 3: 3,
 4: 4,
 5: 0,
 6: 1,
 7: 2,
 8: 3,
 9: 4,
 10: 0,
 11: 1,
 12: 2,
 13: 3,
 14: 4}
```

In [182…
```
{x%5 for x in range(15)}
```

Out[182…
```
{0, 1, 2, 3, 4}
```

In [183…
```
a = {
    5: [7,8,9],
}
```

In [184…
```
{x: list(range(x)) for x in range(10)}
```

Out[184…
```
{0: [],
 1: [0],
 2: [0, 1],
 3: [0, 1, 2],
 4: [0, 1, 2, 3],
 5: [0, 1, 2, 3, 4],
 6: [0, 1, 2, 3, 4, 5],
 7: [0, 1, 2, 3, 4, 5, 6],
 8: [0, 1, 2, 3, 4, 5, 6, 7],
 9: [0, 1, 2, 3, 4, 5, 6, 7, 8]}
```

In [ ]:

In [ ]:

In [ ]: