In [1]:
```
def am9():
    print('good morning team')
```

In [4]:
```
def am9():
    print('good morning team')
am9()
```

```
good morning team
```

In [5]:
```
def greet():
    print('hello')
    print('good morning')
```

In [6]:
```
def greet():
    print('hello')
    print('good morning')
greet()
```

```
hello
good morning
```

In [7]:
```
def greet():
    print('hello')
    print('good morning')
greet()
def greet():
    print('hello')
    print('good morning')
greet()
def greet():
    print('hello')
    print('good morning')
greet()
```

```
hello
good morning
hello
good morning
hello
good morning
```

In [8]:
```
def greet():
    print('hello good morning boss')
greet()
```

```
hello good morning boss
```

In [9]:
```
def greet():
    print('hello boss good morning')
greet()
greet()
greet()
```

```
hello boss good morning
hello boss good morning
hello boss good morning
```

In [10]:
```
def add(x,y):
    c = x+y
    print(c)
add(5,6,7,8)
```

```
---------------------------------------------------------------------------
TypeError                                 Traceback (most recent call last)
Cell In[10], line 4
      2     c = x+y
      3     print(c)
----> 4 add(5,6,7,8)

TypeError: add() takes 2 positional arguments but 4 were given
```

In [11]:
```
def add(x,y):
    c = x+y
    print(c)
add(5,6)
```

```
11
```

In [12]:
```
def add(x,y,z):
    c=x+y+z+m
    print(c)
add(1,4,5)
```

```
---------------------------------------------------------------------------
NameError                                 Traceback (most recent call last)
Cell In[12], line 4
      2     c=x+y+z+m
      3     print(c)
----> 4 add(1,4,5)

Cell In[12], line 2, in add(x, y, z)
      1 def add(x,y,z):
----> 2     c=x+y+z+m
      3     print(c)

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

In [13]:
```
def add(x,y,z,m):
    c=x+y+z+m
    print(c)
add(1,4,5,6)
```

```
16
```

In [14]:
```
def greet():
    print('hello')
    print('good mornig')
greet()
```

```
hello
good mornig
```

In [15]:
```
def add(x,y):
    c = x+y
    print(c)
add(5,6)
```

```
11
```

In [16]:
```
def greet():
    print('hello')
    print('good morning')
greet()

def add(x,y):
    c=x+y
```

```
    print(c)
add(5,6)
```

```
hello
good morning
11
```

In [17]:
```
def greet():
    print('hello')
    print('good morning')

def add(x,y):
    c=x+y
    print(c)

add(5,6)
greet()
```

```
11
hello
good morning
```

In [21]:
```
def greet():
    print('hello')
    print('good morning')

def add(x,y):
    c=x+y
    print(c)

def sub(x,y):
    d=x-y
    print(d)

greet()
add(5,8)
sub(11,90)
```

```
hello
good morning
13
-79
```

In [22]:
```
def add_sub(x,y):
    c=x+y
    d=x-y
    print(c)
    print(d)

add_sub(10,5)
```

```
15
5
```

In [23]:
```
def add_sub(x,y):
    c=x+y
    d=x-y
    return c,d

add_sub(10,5)
```

Out[23]: (15, 5)

In [24]:
```
def add_sub(x,y):
    c=x+y
    d=x-y
    return c,d

result = add_sub(5,4)
print(result)
```

```
(9, 1)
```

In [25]:
```
def add_sub(x,y):
    c=x+y
    d=x-y
    return c,d

result1,result2 = add_sub(5,4)
print(result1,result2)
```

```
9 1
```

In [26]:
```
def add(x,y):
    c=x+y
```

```
    print(c)

add(5,6)
```

```
11
```

FORMAL ARGUMENT & ACTUAL ARGUMENT

In [27]:
```
def person(name,age):
    print(name)
    print(age)

person('nit',23,34) #TypeError: person() takes 2 positional arguments but 3 were given
```

```
---------------------------------------------------------------------------
TypeError                                 Traceback (most recent call last)
Cell In[27], line 5
      2     print(name)
      3     print(age)
----> 5 person('nit',23,34)

TypeError: person() takes 2 positional arguments but 3 were given
```

positional argument

In [28]:
```
def person(name,age):
    print(name)
    print(age)

person('nit',23)
```

```
nit
23
```

In [29]:
```
def person(name,age):
    print(name)
    print(age)
```

```
person(23,'nit')
```

```
23
nit
```

In [31]:
```
def person(name,age):
    print(name)
    print(age+1)

person(23,'nit') #TypeError: can only concatenate str (not "int") to str
```

```
23
---------------------------------------------------------------------------
TypeError                                 Traceback (most recent call last)
Cell In[31], line 5
      2     print(name)
      3     print(age+1)
----> 5 person(23,'nit') #TypeError: can only concatenate str (not "int") to str

Cell In[31], line 3, in person(name, age)
      1 def person(name,age):
      2     print(name)
----> 3     print(age+1)

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

keyword argument

In [32]:
```
def person(name,age):
    print(name)
    print(age+1)

person(age=23 , name='nit')
```

```
nit
24
```

In [34]:
```
def person(name,age):
    print(name)
    print(age+1)
```

```
person(age1=23 , name='nit') #TypeError: person() got an unexpected keyword argument 'age1'
```

```
---------------------------------------------------------------------------
TypeError                                 Traceback (most recent call last)
Cell In[34], line 5
      2     print(name)
      3     print(age+1)
----> 5 person(age1=23 , name='nit') #TypeError: person() got an unexpected keyword argument 'age1'

TypeError: person() got an unexpected keyword argument 'age1'
```

In [35]:
```
def person(name,age1):
    print(name)
    print(age1+1)

person(age1=23 , name='nit')
```

```
nit
24
```

In [36]:
```
def person(name,age,city):
    print(name)
    print(age+1)
    print(city)

person(age=23 , name='nit',city='hyd')
```

```
nit
24
hyd
```

default argument

In [37]:
```
def person(name,age=18):
    print(name)
    print(age)
person('nit',24)
```

```
nit
24
```

Variable Length Argument

In [1]:
```
def sum(a,b):
    c=a+b
    return c

sum(5,6)
```

Out[1]: 11

In [2]:
```
def sum(a,b):
    c=a+b
    return c

sum(5,6,7,8,9,10)
```

```
---------------------------------------------------------------------------
TypeError                                 Traceback (most recent call last)
Cell In[2], line 5
      2     c=a+b
      3     return c
----> 5 sum(5,6,7,8,9,10)

TypeError: sum() takes 2 positional arguments but 6 were given
```

In [3]:
```
def sum(a, *b):
    print(type(a))
    print(type(b))

sum(5,6,7,8)
```

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

In [4]:
```
def sum(a, *b):
    c=a

    for i in b:
        c= c+i
```

```
    print(c)

sum(5,6,7,8,22,354,657)
```

```
1059
```

In [5]:
```
def sum(a, *b):
    c=a

    for i in b:
        c=c+i
    print(c)

sum(5,7,9,23)
```

```
44
```

In [6]:
```
def person():
    person('ALEX',36,'JOHN',999900)
```

In [7]:
```
def person(name , * data):
    print(name)
    print(data)

person('ALEX',36,'JOHN',999900)
```

```
ALEX
(36, 'JOHN', 999900)
```

In [8]:
```
def person(name,*data):
    print(name)
    print(data)

person('ALEX',AGE=36,home_palce='southcity',mob=526357236)
```

```
---------------------------------------------------------------------------
TypeError                                 Traceback (most recent call last)
Cell In[8], line 5
      2     print(name)
      3     print(data)
----> 5 person('ALEX',AGE=36,home_palce='southcity',mob=526357236)

TypeError: person() got an unexpected keyword argument 'AGE'
```

In [9]:
```
def person(name,**data):
    print(name)
    print(data)

person('ALEX',AGE=36,home_palce='southcity',mob=526357236)
```

```
ALEX
{'AGE': 36, 'home_palce': 'southcity', 'mob': 526357236}
```

global variable vs local variable

In [10]:
```
a =10
print(a)
```

```
10
```

In [11]:
```
a = 10

def something():
    b=15
    print('in function',b)
    print('out function',a)
```

In [12]:
```
a = 10
def something():
    b =15

print('in function',b)
print('out function',a)
```

```
---------------------------------------------------------------------------
NameError                                 Traceback (most recent call last)
Cell In[12], line 5
      2 def something():
      3     b =15
----> 5 print('in function',b)
      6 print('out function',a)

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

In [13]:
```
a = 10

def something():
    b=15
    print('in function',b)

print('out function',a)
```

```
out function 10
```

In [14]:
```
a =10

def something():
    a=15

print('in function',a)
print('out function',a)
```

```
in function 10
out function 10
```

In [15]:
```
a =10

def something():
    b =15
    print('in function',b)

something()
print('out funtion',a)
```

```
in function 15
out funtion 10
```

In [16]:
```
a =10

def something():
    b = 55
    print('in funtion',b)

something()
print('out function',a)
```

```
in funtion 55
out function 10
```

global keyword

In [17]:
```python
# if i want to define global variabel inside the function
a =10

def something():
    global a
    b=15
    print('in function',b)
    print('out funtion',a)

something()
print('out funtion',a)
```

```
in function 15
out funtion 10
out funtion 10
```

In [18]:
```python
x =10

def update_x():
    global x
    x +=5

update_x()
print(x)
```

```
15
```

global() ---> access and modify

In [19]:
```python
x =10

def update_x():
    globals()['x']+=5
```

```
update_x()
print(x)
```

```
15
```

In [23]:
```
def count(lst):

lst=[1,2,3,4,5,6]
lst
```

```
  Cell In[23], line 3
    lst=[1,2,3,4,5,6]
    ^
IndentationError: expected an indented block after function definition on line 1
```

In [26]:
```
def count(lst):

    even =0
    odd=0

    for i in lst:
        if i%2==0:
            even+=1
        else:
            odd+=1
    return odd,even

lst=[1,2,3,4,5,6]
even,odd = count(lst)

print(even)
print(odd)
```

```
3
3
```

In [28]:
```
def count(lst):
    even = 0
    odd = 0
    for i in lst:
        if i%2==0:
            even+=1
        else:
```

```
            odd+=1
    return even , odd
lst=[1,2,3,4,5,6,6347,57]
even,odd=count(lst)

print(even)
print(odd)
```

```
3
5
```

In [31]:

```
def fib(n):
    a=0
    b=1
    print(a)
    print(b)
    for i in range(0,n):
        c=a+b
        a=b
        b=c
        print(a)
        print(b)

fib(10)
```

```
0
1
1
1
1
2
2
3
3
5
5
8
8
13
13
21
21
34
34
55
55
89
```

recurssion callin function from itself

In [1]:
```
def wish():
    print('hi')
    print('hello')
wish()
```

```
hi
hello
```

In [2]:
```
def wish():
    print('hi')
    print('hello')
    wish()
wish()          #RecursionError: maximum recursion depth exceeded
```

hi
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---------------------------------------------------------------------------
RecursionError                            Traceback (most recent call last)
Cell In[2], line 5
      3     print('hello')
      4     wish()
----> 5 wish()

Cell In[2], line 4, in wish()
      2 print('hi')
      3 print('hello')
----> 4 wish()

Cell In[2], line 4, in wish()
      2 print('hi')
      3 print('hello')
----> 4 wish()

    [... skipping similar frames: wish at line 4 (2972 times)]

Cell In[2], line 4, in wish()
      2 print('hi')
      3 print('hello')
----> 4 wish()

Cell In[2], line 2, in wish()
      1 def wish():
----> 2     print('hi')
      3     print('hello')
      4     wish()

File ~\AppData\Roaming\Python\Python312\site-packages\ipykernel\iostream.py:664, in OutStream.write(self, string)
    655 def write(self, string: str) -> Optional[int]:  # type:ignore[override]
    656     """Write to current stream after encoding if necessary
    657
    658     Returns
   (...)
    662
    663     """
--> 664     parent = self.parent_header
    666     if not isinstance(string, str):
    667         msg = f"write() argument must be str, not {type(string)}"  # type:ignore[unreachable]
```

```
RecursionError: maximum recursion depth exceeded
```

In [3]:
```
import sys
sys.getrecursionlimit()
```

Out[3]:
```
3000
```

In [5]:
```
import sys
sys.setrecursionlimit(200)
print(sys.getrecursionlimit())
```

```
200
```

In [6]:
```
import sys
sys.getrecursionlimit()
```

Out[6]:
```
200
```

In [7]:
```
def wish():
    print('hi')
    print('hello')
    wish()
wish()
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---------------------------------------------------------------------------
RecursionError                            Traceback (most recent call last)
Cell In[7], line 5
      3     print('hello')
      4     wish()
----> 5 wish()

Cell In[7], line 4, in wish()
      2 print('hi')
      3 print('hello')
----> 4 wish()

Cell In[7], line 4, in wish()
      2 print('hi')
      3 print('hello')
----> 4 wish()

    [... skipping similar frames: wish at line 4 (172 times)]

Cell In[7], line 4, in wish()
      2 print('hi')
      3 print('hello')
----> 4 wish()

Cell In[7], line 2, in wish()
      1 def wish():
----> 2     print('hi')
      3     print('hello')
      4     wish()

File ~\AppData\Roaming\Python\Python312\site-packages\ipykernel\iostream.py:664, in OutStream.write(self, string)
    655 def write(self, string: str) -> Optional[int]:  # type:ignore[override]
    656     """Write to current stream after encoding if necessary
    657
    658     Returns
   (...)
    662
    663     """
--> 664     parent = self.parent_header
    666     if not isinstance(string, str):
    667         msg = f"write() argument must be str, not {type(string)}"  # type:ignore[unreachable]
```

```
RecursionError: maximum recursion depth exceeded
```

In [8]:

```python
import sys
sys.setrecursionlimit(150)
print(sys.getrecursionlimit())

i =0
def wish():
    global i
    i+=1
    print('hello',i)
    wish()

wish()
```

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```

```
---------------------------------------------------------------------------
RecursionError                            Traceback (most recent call last)
Cell In[8], line 12
      9     print('hello',i)
     10     wish()
---> 12 wish()

Cell In[8], line 10, in wish()
      8 i+=1
      9 print('hello',i)
---> 10 wish()

Cell In[8], line 10, in wish()
      8 i+=1
      9 print('hello',i)
---> 10 wish()

    [... skipping similar frames: wish at line 10 (122 times)]

Cell In[8], line 10, in wish()
      8 i+=1
      9 print('hello',i)
---> 10 wish()

Cell In[8], line 9, in wish()
      7 global i
      8 i+=1
----> 9 print('hello',i)
     10 wish()

File ~\AppData\Roaming\Python\Python312\site-packages\ipykernel\iostream.py:664, in OutStream.write(self, string)
    655 def write(self, string: str) -> Optional[int]:  # type:ignore[override]
    656     """Write to current stream after encoding if necessary
    657
    658     Returns
   (...)
    662
    663     """
--> 664     parent = self.parent_header
    666     if not isinstance(string, str):
    667         msg = f"write() argument must be str, not {type(string)}"  # type:ignore[unreachable]
```

```
RecursionError: maximum recursion depth exceeded
```

In [9]:
```
# factorial using recursion
```

In [11]:
```
def fact(n):
    if n==0:
        return 1
    return n*fact(n-1)
result=fact(5)
result
```

Out[11]: 120

In [12]:
```
# anonymoous function /lambda
```

In [14]:
```
def sqare(a):
    return a*a
result=sqare(5)
result
```

Out[14]: 25

In [15]:
```
def sqare(a):
    return a*a

sqare(2)
```

Out[15]: 4

In [17]:
```
# lambda
```

In [16]:
```
f = lambda a:a*a
result=f(5)
result
```

Out[16]: 25

In [19]:
```
f = lambda a,b :a+b
f1=lambda a,b :a-b
```

```
result=f(3,4)
result1=f1(10,4)

print(result)
print(result1)
```

```
7
6
```

In [20]:
```
def person(name,*data):
    print(name)
    print(data)

person('alex',36,'john',98626)
```

```
alex
(36, 'john', 98626)
```

In [24]:
```
def person(name,*data):
    print('name')
    print(data)


person('alex',age=36,home_place='southcity',mob=0898789786)
```

```
  Cell In[24], line 6
    person('alex',age=36,home_place='southcity',mob=0898789786)
                                                ^
SyntaxError: leading zeros in decimal integer literals are not permitted; use an 0o prefix for octal integers
```

In [26]:
```
def person(name,**data):
    print('name')
    print(data)


person('alex',age=36,home_place='southcity',mob=898789786)
```

```
name
{'age': 36, 'home_place': 'southcity', 'mob': 898789786}
```

In [27]:
```
def person(name,**data):
    print(name)
```

```
    for i,j in data.items():
        print(i,j)

person('john',age=36,home_place='southcity',mob=98876533)
```

```
john
age 36
home_place southcity
mob 98876533
```

global variable vs local variable

In [28]:
```
a =10
print(a)
```

```
10
```

In [29]:
```
a = 10
def something():
    b =15
    print(b)
    print(a)
```

In [30]:
```
a =10
def something():
    b =15
    print(b)

print(a)
```

```
10
```

In [31]:
```
a =10
def something():
    a=15

print(a)
print(a)
```

```
10
10
```

In [32]:
```
a = 10
def something():
    b =15
    print(b)

something()
print(a)
```

```
15
10
```

In [33]:
```
a= 10
def something():
    print('in function',a)

something()
print('out function',a)
```

```
in function 10
out function 10
```

In [34]:
```
a = 10
def something():
    b =25
    print(b)

something()
print(a)
```

```
25
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```

In [36]:
```
a= 14
def something():
    a=55
    print(a)

something()
print(a)
```

```
55
14
```

global keyword

In [38]:
```
a = 10
def something():
    global a
    b=15
    print(a)
    print(b)

something()
print(a)
```

```
10
15
10
```

In [40]:
```
a = 20
def something():
    global a
    a=15
    print(a)
    print(a)

something()
print(a)
```

```
15
15
15
```

In [41]:
```
a = 20
def something():
    global a
    a=15
    print(a)
    a = 9
```

```
something()
print(a)
```

```
15
9
```

global function

In [42]:
```
a = 10
print(a)

def something():
    a = 9
    x = globals()['a']

    print(x)
    print(a)

something()
print(a)
```

```
10
10
9
10
```

In [43]:
```
a = 10
print(id(a))

def something():
    a = 9
    x=globals()
    print(x)
    print(a)
    globals()['a'] = 15

something()
print(a)
```

140727927651032
{'__name__': '__main__', '__doc__': 'Automatically created module for IPython interactive environment', '__package_
_': None, '__loader__': None, '__spec__': None, '__builtin__': <module 'builtins' (built-in)>, '__builtins__': <modul
e 'builtins' (built-in)>, '_ih': ['', "def wish():\n   print('hi')\n   print('hello')\nwish()", "def wish():\n   p
rint('hi')\n   print('hello')\n   wish()\nwish()", 'import sys\nsys.getrecursionlimit()', 'import sys\nsys.getrecur
sionlimit(200)\nprint(sys.getrecursionlimit())', 'import sys\nsys.setrecursionlimit(200)\nprint(sys.getrecursionlimit
())', 'import sys\nsys.getrecursionlimit()', "def wish():\n   print('hi')\n   print('hello')\n   wish()\nwish()
", "import sys\nsys.setrecursionlimit(150)\nprint(sys.getrecursionlimit())\n\ni =0\ndef wish():\n   global i\n   i+
=1\n   print('hello',i)\n   wish()\n\nwish()", '# factorial using recursion', 'def fact(n):\n   if n==0:\n
return 1\n   return n*fact(n-1)\nresult=fact()\nresult', 'def fact(n):\n   if n==0:\n   return 1\n   return n
*fact(n-1)\nresult=fact(5)\nresult', '# anonymoous function /lambda ', 'def sqare(a):\n   return a*a\n\nsqare(2)',
'def sqare(a):\n   return a*a\nresult=sqare(5)\nresult', 'def sqare(a):\n   return a*a\n\nsqare(2)', 'f = lambda a:
a*a\nresult=f(5)\nresult', '# lambda', 'f = lambda a,b :a+b\nf1=lambda a,b :a-b\n\nresult=f(3,4)\nresult1=f1(10,4)\n
\nresult\nresult1', 'f = lambda a,b :a+b\nf1=lambda a,b :a-b\n\nresult=f(3,4)\nresult1=f1(10,4)\n\nprint(result)\npri
nt(result1)', "def person(name,*data):\n   print(name)\n   print(data)\n\nperson('alex',36,'john',98626)", "def per
son(name,**data):\n   print('name')\n   print(data)\n\nperson('alex',age=36,home_place='southcity',mob=089878978
6)", "def person(name,**data):   print('name')\n   print(data)\n\n \nperson('alex',age=36,home_place='southcity',mob
=0898789786)", "def person(name,**data):   \n   print('name')\n   print(data)\n\n \nperson('alex',age=36,home_place
='southcity',mob=0898789786)", "def person(name,*data):   \n   print('name')\n   print(data)\n\n \nperson('alex',ag
e=36,home_place='southcity',mob=0898789786)", "def person(name,**data):   \n   print('name')\n   print(data)\n\n \n
person('alex',age=36,home_place='southcity',mob=0898789786)", "def person(name,**data):   \n   print('name')\n   pr
int(data)\n\n \nperson('alex',age=36,home_place='southcity',mob=898789786)", "def person(name,**data):\n   print(nam
e)\n\n   for i,j in data.items():\n   print(i,j)\n\nperson('john',age=36,home_place='southcity',mob=98876533)",
'a =10\nprint(a)', 'a = 10\ndef something():\n   b =15\n   print(b)\n   print(a)', 'a =10\ndef something():\n   b
=15\n   print(b)\n\nprint(a)', 'a =10\ndef something():\n   a=15\n\nprint(a)\nprint(a)', 'a = 10\ndef something
():\n   b =15\n   print(b)\n\nsomething()\nprint(a)', "a= 10\ndef something():\n   print('in function',a)\n\nsomet
hing()\nprint('out function',a)", 'a = 10\ndef something():\n   b =25\n   print(b)\n\nsomething()\nprint(a)', 'a= 1
4\ndef something():\n   a=55\n   print(a)\n\nsomething()\nprint(b)', 'a= 14\ndef something():\n   a=55\n   print
(a)\n\nsomething()\nprint(a)', 'a = 10\ndef something():\n   global a\n   b=15\n   print(b)\n   print(a)\n\nsomet
hing()\nprint(a)', 'a = 10\ndef something():\n   global a\n   b=15\n   print(a)\n   print(b)\n\nsomething()\nprin
t(a)', 'a = 20\ndef something():\n   global a\n   a=15\n   print(a)\n\nsomething()\nprint(a)', 'a = 20\ndef someth
ing():\n   global a\n   a=15\n   print(a)\n   print(a)\n\nsomething()\nprint(a)', 'a = 20\ndef something():\n
global a\n   a=15\n   print(a)\n   a = 9\n\nsomething()\nprint(a)', "a = 10\nprint(a)\n\ndef something():\n   a =
9\n   x = globals()['a']\n\n   print(x)\n   print(a)\n\nsomething()\nprint(a)", "a = 10\nprint(id(a))\n\ndef somet
hing():\n   a = 9\n   x=globals()\n   print(x)\n   print(a)\n   globals()['a'] = 15\n\nsomething()\nprint(a)"],
'_oh': {3: 3000, 6: 200, 11: 120, 13: 4, 14: 25, 15: 4, 16: 25, 18: 6}, '_dh': [WindowsPath('C:/Users/ADMIN/vs code p
rojects')], 'In': ['', "def wish():\n   print('hi')\n   print('hello')\nwish()", "def wish():\n   print('hi')\n
print('hello')\n   wish()\nwish()", 'import sys\nsys.getrecursionlimit()', 'import sys\nsys.getrecursionlimit(200)\n
print(sys.getrecursionlimit())', 'import sys\nsys.setrecursionlimit(200)\nprint(sys.getrecursionlimit())', 'import sy
s\nsys.getrecursionlimit()', "def wish():\n   print('hi')\n   print('hello')\n   wish()\nwish()   ", "import sys\n
sys.setrecursionlimit(150)\nprint(sys.getrecursionlimit())\n\ni =0\ndef wish():\n   global i\n   i+=1\n   print('h
ello',i)\n   wish()\n\nwish()", '# factorial using recursion', 'def fact(n):\n   if n==0:\n   return 1\n   re

turn n*fact(n-1)\nresult=fact()\nresult', 'def fact(n):\n   if n==0:\n   return 1\n   return n*fact(n-1)\nresu
lt=fact(5)\nresult', '# anonymoous function /lambda ', 'def sqare(a):\n   return a*a\n\nsqare(2)', 'def sqare(a):\n
return a*a\nresult=sqare(5)\nresult', 'def sqare(a):\n   return a*a\n\nsqare(2)', 'f = lambda a:a*a\nresult=f(5)\nre
sult', '# lambda', 'f = lambda a,b :a+b\nf1=lambda a,b :a-b\n\nresult=f(3,4)\nresult1=f1(10,4)\n\nresult\nresult1',
'f = lambda a,b :a+b\nf1=lambda a,b :a-b\n\nresult=f(3,4)\nresult1=f1(10,4)\n\nprint(result)\nprint(result1)', "def p
erson(name,*data):\n   print(name)\n   print(data)\n\nperson('alex',36,'john',98626)", "def person(name,**data):\n
print('name')\n   print(data)\n\nperson('alex',age=36,home_place='southcity',mob=0898789786)", "def person(name,**da
ta):   print('name')\n   print(data)\n\n \nperson('alex',age=36,home_place='southcity',mob=0898789786)", "def person
(name,**data):   \n   print('name')\n   print(data)\n\n \nperson('alex',age=36,home_place='southcity',mob=089878978
6)", "def person(name,*data):   \n   print('name')\n   print(data)\n\n \nperson('alex',age=36,home_place='southcit
y',mob=0898789786)", "def person(name,**data):   \n   print('name')\n   print(data)\n\n \nperson('alex',age=36,home
_place='southcity',mob=0898789786)", "def person(name,**data):   \n   print('name')\n   print(data)\n\n \nperson('a
lex',age=36,home_place='southcity',mob=898789786)", "def person(name,**data):\n   print(name)\n\n   for i,j in dat
a.items():\n   print(i,j)\n\nperson('john',age=36,home_place='southcity',mob=98876533)", 'a =10\nprint(a)', 'a =
10\ndef something():\n   b =15\n   print(b)\n   print(a)', 'a =10\ndef something():\n   b =15\n   print(b)\n\npr
int(a)', 'a =10\ndef something():\n   a=15\n\nprint(a)\nprint(a)', 'a = 10\ndef something():\n   b =15\n   print
(b)\n\nsomething()\nprint(a)', "a= 10\ndef something():\n   print('in function',a)\n\nsomething()\nprint('out functi
on',a)", 'a = 10\ndef something():\n   b =25\n   print(b)\n\nsomething()\nprint(a)', 'a= 14\ndef something():\n
a=55\n   print(a)\n\nsomething()\nprint(b)', 'a= 14\ndef something():\n   a=55\n   print(a)\n\nsomething()\nprint
(a)', 'a = 10\ndef something():\n   global a\n   b=15\n   print(b)\n   print(a)\n\nsomething()\nprint(a)', 'a = 1
0\ndef something():\n   global a\n   b=15\n   print(a)\n   print(b)\n\nsomething()\nprint(a)', 'a = 20\ndef somet
hing():\n   global a\n   a=15\n   print(a)\n\nsomething()\nprint(a)', 'a = 20\ndef something():\n   global a\n
a=15\n   print(a)\n   print(a)\n\nsomething()\nprint(a)', 'a = 20\ndef something():\n   global a\n   a=15\n   pr
int(a)\n   a = 9\n\nsomething()\nprint(a)', "a = 10\nprint(a)\n\ndef something():\n   a = 9\n   x = globals()['a']
\n\n   print(x)\n   print(a)\n\nsomething()\nprint(a)", "a = 10\nprint(id(a))\n\ndef something():\n   a = 9\n   x
=globals()\n   print(x)\n   print(a)\n   globals()['a'] = 15\n\nsomething()\nprint(a)"], 'Out': {3: 3000, 6: 200,
11: 120, 13: 4, 14: 25, 15: 4, 16: 25, 18: 6}, 'get_ipython': <bound method InteractiveShell.get_ipython of <ipykerne
l.zmqshell.ZMQInteractiveShell object at 0x000001CD1A03B6B0>>, 'exit': <IPython.core.autocall.ZMQExitAutocall object
at 0x000001CD1A03BC20>, 'quit': <IPython.core.autocall.ZMQExitAutocall object at 0x000001CD1A03BC20>, 'open': <functi
on open at 0x000001CD181DCF40>, '_': 6, '__': 25, '___': 4, '__session__': 'C:\\Users\\ADMIN\\vs code projects\\9AM F
UNCTIONS.ipynb', '_i': "a = 10\nprint(a)\n\ndef something():\n   a = 9\n   x = globals()['a']\n\n   print(x)\n
print(a)\n\nsomething()\nprint(a)", '_ii': 'a = 20\ndef something():\n   global a\n   a=15\n   print(a)\n   a = 9
\n\nsomething()\nprint(a)', '_iii': 'a = 20\ndef something():\n   global a\n   a=15\n   print(a)\n   print(a)\n\n
something()\nprint(a)', '_i1': "def wish():\n   print('hi')\n   print('hello')\nwish()", 'wish': <function wish at
0x000001CD1A9BB380>, '_i2': "def wish():\n   print('hi')\n   print('hello')\n   wish()\nwish()", '_i3': 'import sy
s\nsys.getrecursionlimit()', 'sys': <module 'sys' (built-in)>, '_3': 3000, '_i4': 'import sys\nsys.getrecursionlimit
(200)\nprint(sys.getrecursionlimit())', '_i5': 'import sys\nsys.setrecursionlimit(200)\nprint(sys.getrecursionlimit
())', '_i6': 'import sys\nsys.getrecursionlimit()', '_6': 200, '_i7': "def wish():\n   print('hi')\n   print('hell
o')\n   wish()\nwish()   ", '_i8': "import sys\nsys.setrecursionlimit(150)\nprint(sys.getrecursionlimit())\n\ni =0\n
def wish():\n   global i\n   i+=1\n   print('hello',i)\n   wish()\n\nwish()", 'i': 126, '_i9': '# factorial using
recursion', '_i10': 'def fact(n):\n   if n==0:\n   return 1\n   return n*fact(n-1)\nresult=fact()\nresult', 'f
act': <function fact at 0x000001CD1A29BD80>, '_i11': 'def fact(n):\n   if n==0:\n   return 1\n   return n*fact

(n-1)\nresult=fact(5)\nresult', 'result': 7, '_11': 120, '_i12': '# anonymoous function /lambda ', '_i13': 'def sqare
(a):\n   return a*a\n\nsqare(2)', 'sqare': <function sqare at 0x000001CD1A9551C0>, '_13': 4, '_i14': 'def sqare
(a):\n   return a*a\nresult=sqare(5)\nresult', '_14': 25, '_i15': 'def sqare(a):\n   return a*a\n\nsqare(2)', '_1
5': 4, '_i16': 'f = lambda a:a*a\nresult=f(5)\nresult', 'f': <function <lambda> at 0x000001CD1A955E40>, '_16': 25, '_
i17': '# lambda', '_i18': 'f = lambda a,b :a+b\nf1=lambda a,b :a-b\n\nresult=f(3,4)\nresult1=f1(10,4)\n\nresult\nresu
lt1', 'f1': <function <lambda> at 0x000001CD1A9E4F40>, 'result1': 6, '_18': 6, '_i19': 'f = lambda a,b :a+b\nf1=lambd
a a,b :a-b\n\nresult=f(3,4)\nresult1=f1(10,4)\n\nprint(result)\nprint(result1)', '_i20': "def person(name,*data):\n
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mob=0898789786)", '_i22': "def person(name,**data):   print('name')\n   print(data)\n\n \nperson('alex',age=36,home_
place='southcity',mob=0898789786)", '_i23': "def person(name,**data):   \n   print('name')\n   print(data)\n\n \npe
rson('alex',age=36,home_place='southcity',mob=0898789786)", '_i24': "def person(name,*data):   \n   print('name')\n
print(data)\n\n \nperson('alex',age=36,home_place='southcity',mob=0898789786)", '_i25': "def person(name,**data):
\n   print('name')\n   print(data)\n\n \nperson('alex',age=36,home_place='southcity',mob=0898789786)", '_i26': "def
person(name,**data):   \n   print('name')\n   print(data)\n\n \nperson('alex',age=36,home_place='southcity',mob=898
789786)", '_i27': "def person(name,**data):\n   print(name)\n\n   for i,j in data.items():\n   print(i,j)\n\np
erson('john',age=36,home_place='southcity',mob=98876533)", '_i28': 'a =10\nprint(a)', 'a': 10, '_i29': 'a = 10\ndef s
omething():\n   b =15\n   print(b)\n   print(a)', 'something': <function something at 0x000001CD1A9E7600>, '_i30':
'a =10\ndef something():\n   b =15\n   print(b)\n\nprint(a)', '_i31': 'a =10\ndef something():\n   a=15\n\nprint
(a)\nprint(a)', '_i32': 'a = 10\ndef something():\n   b =15\n   print(b)\n\nsomething()\nprint(a)', '_i33': "a= 10
\ndef something():\n   print('in function',a)\n\nsomething()\nprint('out function',a)", '_i34': 'a = 10\ndef somethi
ng():\n   b =25\n   print(b)\n\nsomething()\nprint(a)', '_i35': 'a= 14\ndef something():\n   a=55\n   print(a)\n
\nsomething()\nprint(b)', '_i36': 'a= 14\ndef something():\n   a=55\n   print(a)\n\nsomething()\nprint(a)', '_i37':
'a = 10\ndef something():\n   global a\n   b=15\n   print(b)\n   print(a)\n\nsomething()\nprint(a)', '_i38': 'a =
10\ndef something():\n   global a\n   b=15\n   print(a)\n   print(b)\n\nsomething()\nprint(a)', '_i39': 'a = 20\n
def something():\n   global a\n   a=15\n   print(a)\n\nsomething()\nprint(a)', '_i40': 'a = 20\ndef something():\n
global a\n   a=15\n   print(a)\n   print(a)\n\nsomething()\nprint(a)', '_i41': 'a = 20\ndef something():\n   glob
al a\n   a=15\n   print(a)\n   a = 9\n\nsomething()\nprint(a)', '_i42': "a = 10\nprint(a)\n\ndef something():\n
a = 9\n   x = globals()['a']\n\n   print(x)\n   print(a)\n\nsomething()\nprint(a)", '_i43': "a = 10\nprint(id(a))
\n\ndef something():\n   a = 9\n   x=globals()\n   print(x)\n   print(a)\n   globals()['a'] = 15\n\nsomething()
\nprint(a)"}
9
15

In [44]:
```
def fib(n):
    a =0
    b=1

    print(a)
    print(b)

    for i in range(0,n):
```

```
        c=a+b
        a=b
        b=c
        print(c)

fib(10)
```

```
0
1
1
2
3
5
8
13
21
34
55
89
```

In [46]:
```
def fib(n):
    a,b=0,1
    if n==1:
        print(a)
    else:
        print(a)
        print(b)

        for i in range(2,n):
            c=a+b
            a=b
            b=c
            print(c)

fib(6)
```

```
0
1
1
2
3
5
```

factorial number

In [48]:
```
def fact(n):
    f = 1
    for i in range(1,n+1):
        f = f*i

    return f

x=6
result=fact(x)
print(result)
```

```
720
```

Recurrsion function

In [49]:
```
def wish():
    print('hello')
    print('hi')

wish()
```

```
hello
hi
```

In [50]:
```
def wish():
    print('hello')
    print('hi')
    wish()

wish()  # 3000 times will print and then gives RecursionError: maximum recursion depth exceeded
```

hello
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```
---------------------------------------------------------------------------
RecursionError                            Traceback (most recent call last)
Cell In[50], line 6
      3     print('hi')
      4     wish()
----> 6 wish()

Cell In[50], line 4, in wish()
      2 print('hello')
      3 print('hi')
----> 4 wish()

Cell In[50], line 4, in wish()
      2 print('hello')
      3 print('hi')
----> 4 wish()

    [... skipping similar frames: wish at line 4 (122 times)]

Cell In[50], line 4, in wish()
      2 print('hello')
      3 print('hi')
----> 4 wish()

Cell In[50], line 2, in wish()
      1 def wish():
----> 2     print('hello')
      3     print('hi')
      4     wish()

File ~\AppData\Roaming\Python\Python312\site-packages\ipykernel\iostream.py:664, in OutStream.write(self, string)
    655 def write(self, string: str) -> Optional[int]:  # type:ignore[override]
    656     """Write to current stream after encoding if necessary
    657
    658     Returns
   (...)
    662
    663     """
--> 664     parent = self.parent_header
    666     if not isinstance(string, str):
    667         msg = f"write() argument must be str, not {type(string)}"  # type:ignore[unreachable]
```

```
RecursionError: maximum recursion depth exceeded
```

In [1]:

```python
import sys
sys.setrecursionlimit(120)
print(sys.getrecursionlimit())

i = 0
def wish():
    global i
    i+=1
    print('hello',i)
    wish()

wish()
```

```
120
hello 1
hello 2
hello 3
hello 4
hello 5
hello 6
hello 7
hello 8
hello 9
hello 10
hello 11
hello 12
hello 13
hello 14
hello 15
hello 16
hello 17
hello 18
hello 19
hello 20
hello 21
hello 22
hello 23
hello 24
hello 25
hello 26
hello 27
hello 28
hello 29
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hello 31
hello 32
hello 33
hello 34
hello 35
hello 36
hello 37
hello 38
hello 39
hello 40
hello 41
```

```
hello 42
hello 43
hello 44
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hello 69
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hello 73
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hello 76
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hello 78
hello 79
hello 80
hello 81
hello 82
hello 83
```

```
hello 84
hello 85
hello 86
hello 87
hello 88
hello 89
hello 90
hello 91
hello 92
hello 93
hello 94
hello 95
```

```
---------------------------------------------------------------------------
RecursionError                            Traceback (most recent call last)
Cell In[1], line 12
      9     print('hello',i)
     10     wish()
---> 12 wish()

Cell In[1], line 10, in wish()
      8 i+=1
      9 print('hello',i)
---> 10 wish()

Cell In[1], line 10, in wish()
      8 i+=1
      9 print('hello',i)
---> 10 wish()

    [... skipping similar frames: wish at line 10 (92 times)]

Cell In[1], line 10, in wish()
      8 i+=1
      9 print('hello',i)
---> 10 wish()

Cell In[1], line 9, in wish()
      7 global i
      8 i+=1
----> 9 print('hello',i)
     10 wish()

File ~\AppData\Roaming\Python\Python312\site-packages\ipykernel\iostream.py:664, in OutStream.write(self, string)
    655 def write(self, string: str) -> Optional[int]:  # type:ignore[override]
    656     """Write to current stream after encoding if necessary
    657
    658     Returns
   (...)
    662
    663     """
--> 664     parent = self.parent_header
    666     if not isinstance(string, str):
    667         msg = f"write() argument must be str, not {type(string)}"  # type:ignore[unreachable]
```

```
RecursionError: maximum recursion depth exceeded
```

In [2]:

```
i =0
def wish():
    global i
    i+=1
    print('hello',i)
    wish()

wish()
```

```
hello 1
hello 2
hello 3
hello 4
hello 5
hello 6
hello 7
hello 8
hello 9
hello 10
hello 11
hello 12
hello 13
hello 14
hello 15
hello 16
hello 17
hello 18
hello 19
hello 20
hello 21
hello 22
hello 23
hello 24
hello 25
hello 26
hello 27
hello 28
hello 29
hello 30
hello 31
hello 32
hello 33
hello 34
hello 35
hello 36
hello 37
hello 38
hello 39
hello 40
hello 41
hello 42
```

```
hello 43
hello 44
hello 45
hello 46
hello 47
hello 48
hello 49
hello 50
hello 51
hello 52
hello 53
hello 54
hello 55
hello 56
hello 57
hello 58
hello 59
hello 60
hello 61
hello 62
hello 63
hello 64
hello 65
hello 66
hello 67
hello 68
hello 69
hello 70
hello 71
hello 72
hello 73
hello 74
hello 75
hello 76
hello 77
hello 78
hello 79
hello 80
hello 81
hello 82
hello 83
hello 84
```

```
hello 85
hello 86
hello 87
hello 88
hello 89
hello 90
hello 91
hello 92
hello 93
hello 94
hello 95
```

```
---------------------------------------------------------------------------
RecursionError                            Traceback (most recent call last)
Cell In[2], line 8
      5     print('hello',i)
      6     wish()
----> 8 wish()

Cell In[2], line 6, in wish()
      4 i+=1
      5 print('hello',i)
----> 6 wish()

Cell In[2], line 6, in wish()
      4 i+=1
      5 print('hello',i)
----> 6 wish()

    [... skipping similar frames: wish at line 6 (92 times)]

Cell In[2], line 6, in wish()
      4 i+=1
      5 print('hello',i)
----> 6 wish()

Cell In[2], line 5, in wish()
      3 global i
      4 i+=1
----> 5 print('hello',i)
      6 wish()

File ~\AppData\Roaming\Python\Python312\site-packages\ipykernel\iostream.py:664, in OutStream.write(self, string)
    655 def write(self, string: str) -> Optional[int]:  # type:ignore[override]
    656     """Write to current stream after encoding if necessary
    657
    658     Returns
   (...)
    662
    663     """
--> 664     parent = self.parent_header
    666     if not isinstance(string, str):
    667         msg = f"write() argument must be str, not {type(string)}"  # type:ignore[unreachable]
```

```
RecursionError: maximum recursion depth exceeded
```

In [3]:
```
import sys
sys.getrecursionlimit()
```

Out[3]:
```
120
```

In [7]:
```
import sys
sys.setrecursionlimit(150)
print(sys.getrecursionlimit())

i = 0
def wish():
    global i
    i+=1
    print('hello',i)
    wish()

wish()
```

```
150
hello 1
hello 2
hello 3
hello 4
hello 5
hello 6
hello 7
hello 8
hello 9
hello 10
hello 11
hello 12
hello 13
hello 14
hello 15
hello 16
hello 17
hello 18
hello 19
hello 20
hello 21
hello 22
hello 23
hello 24
hello 25
hello 26
hello 27
hello 28
hello 29
hello 30
hello 31
hello 32
hello 33
hello 34
hello 35
hello 36
hello 37
hello 38
hello 39
hello 40
hello 41
```

```
hello 42
hello 43
hello 44
hello 45
hello 46
hello 47
hello 48
hello 49
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hello 54
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hello 67
hello 68
hello 69
hello 70
hello 71
hello 72
hello 73
hello 74
hello 75
hello 76
hello 77
hello 78
hello 79
hello 80
hello 81
hello 82
hello 83
```

```
hello 84
hello 85
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hello 96
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hello 98
hello 99
hello 100
hello 101
hello 102
hello 103
hello 104
hello 105
hello 106
hello 107
hello 108
hello 109
hello 110
hello 111
hello 112
hello 113
hello 114
hello 115
hello 116
hello 117
hello 118
hello 119
hello 120
hello 121
hello 122
hello 123
hello 124
hello 125
```

```
---------------------------------------------------------------------------
RecursionError                            Traceback (most recent call last)
Cell In[7], line 12
      9     print('hello',i)
     10     wish()
---> 12 wish()

Cell In[7], line 10, in wish()
      8 i+=1
      9 print('hello',i)
---> 10 wish()

Cell In[7], line 10, in wish()
      8 i+=1
      9 print('hello',i)
---> 10 wish()

    [... skipping similar frames: wish at line 10 (122 times)]

Cell In[7], line 10, in wish()
      8 i+=1
      9 print('hello',i)
---> 10 wish()

Cell In[7], line 9, in wish()
      7 global i
      8 i+=1
----> 9 print('hello',i)
     10 wish()

File ~\AppData\Roaming\Python\Python312\site-packages\ipykernel\iostream.py:664, in OutStream.write(self, string)
    655 def write(self, string: str) -> Optional[int]:  # type:ignore[override]
    656     """Write to current stream after encoding if necessary
    657
    658     Returns
   (...)
    662
    663     """
--> 664     parent = self.parent_header
    666     if not isinstance(string, str):
    667         msg = f"write() argument must be str, not {type(string)}"  # type:ignore[unreachable]
```

```
RecursionError: maximum recursion depth exceeded
```

factorial using recurssion

In [8]:
```
def fact(n):
    if n==0:
        return 1
    return n*fact(n-1)

result=fact(5)
result
```

Out[8]: 120

Anonymous Funtion | Lambda

In [9]:
```
def square(a):
    return a*a
square(5)
```

Out[9]: 25

In [10]:
```
def square(a):
    return a*a

result=square(5)
print(result)
```

```
25
```

Lambda

In [11]:
```
f = lambda a : a*a
result = f(5)
result
```

Out[11]: 25

In [12]:
```
f = lambda a, b : a + b
f1 = lambda a, b : a - b

result = f(1,4)
result1 = f1(4,1)

print(result)
print(result1)
```

```
5
3
```

In [13]:
```
f = lambda a, b : a + b
f1 = lambda a, b : a - b
f2 = lambda a,b : a * b

result = f(1,4)
result1 = f1(4,1)
result2 = f2(4,1)

print(result)
print(result1)
print(result2)
```

```
5
3
4
```

filter() , map() , reduce()

filter()

In [14]:
```
nums = [3,2,6,8,4,6,2,9]
evens = list(filter(is_even,nums))
```

```
---------------------------------------------------------------------------
NameError                                 Traceback (most recent call last)
Cell In[14], line 2
      1 nums = [3,2,6,8,4,6,2,9]
----> 2 evens = list(filter(is_even,nums))

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

In [15]:
```
def is_even(n):
    return n%2==0
nums=[3,2,6,8,4,6,2,9]

evens = list(filter(is_even,nums))
print(evens)
```

```
[2, 6, 8, 4, 6, 2]
```

In [17]:
```
def is_odd(n):
    return n%2==0
nums=[3,2,6,8,4,6,2,9]

odds = list(filter(is_odd,nums))
print(odds)
```

```
[2, 6, 8, 4, 6, 2]
```

In [18]:
```
nums = [3,2,6,8,4,6,2,9]

odd = list(filter(lambda n : n%2!=0,nums))
print(odd)
```

```
[3, 9]
```

In [19]:
```
nums = [3,2,6,8,4,6,2,9]

even=list(filter(lambda n:n%2==0,nums))
odd = list(filter(lambda n : n%2!=0,nums))
print(odd)
print(even)
```

```
[3, 9]
[2, 6, 8, 4, 6, 2]
```

map()

In [20]:
```
def update(n):
    return n+2

nums=[3,2,6,8,9,3,6,2]
evens = list(filter(is_even , nums))
double=list(map(update,evens))

print(evens)
print(double)
```

```
[2, 6, 8, 6, 2]
[4, 8, 10, 8, 4]
```

In [21]:
```
nums = [3,2,6,8,9,3,6,2]

evens = list(filter(is_even,nums))
double = list(map(lambda n : n*2 ,evens))

print(evens)
print(double)
```

```
[2, 6, 8, 6, 2]
[4, 12, 16, 12, 4]
```

In [23]:
```
nums = [3,2,6,8,9,3,6,2]

evens = list(filter(is_even,nums))

double = list(map(lambda n : n*2 , evens))
double1 = list(map(lambda n :n+2 , evens))
double2=list(map(lambda n : n-2 , evens))
print(evens)
print(double)
print(double1)
print(double2)
```

```
[2, 6, 8, 6, 2]
[4, 12, 16, 12, 4]
[4, 8, 10, 8, 4]
[0, 4, 6, 4, 0]
```

In [24]:
```
num = [3,2,6,8,9,3,6,2]
evens = list(filter(is_even,num))

double = list(map(lambda n:n*2,evens))
double1 = list(map(lambda n:n-2,evens))

print(double)
print(double1)
```

```
[4, 12, 16, 12, 4]
[0, 4, 6, 4, 0]
```

reduce()

In [25]:
```
from functools import reduce

def add_all(a,b):
    return a+b

nums=[3,2,6,8,9,3,6,2]

evens = list(filter(is_even,nums))
double = list(map(lambda n:n*2,evens))

sums=reduce(add_all , double)
sums
print(sums)
```

```
48
```

In [26]:
```
from functools import reduce

nums=[3,2,6,8,9,3,6,2]

evens = list(filter(is_even,nums))
double = list(map(lambda n:n*2,evens))
```

```
sums = (reduce(lambda a,b :a+b , double))

print(evens)
print(double)
print(sums)
```

```
[2, 6, 8, 6, 2]
[4, 12, 16, 12, 4]
48
```

In [ ]: