In [1]:
```
import sys
sys.version
```

Out[1]:
```
'3.12.7 | packaged by Anaconda, Inc. | (main, Oct  4 2024, 13:17:27) [MSC v.192
9 64 bit (AMD64)]'
```

In [2]:
```
import numpy as np
```

In [3]:
```
np.__version__
```

Out[3]:
```
'1.26.4'
```

In [11]:
```
np.arange(10)
```

Out[11]:
```
array([0, 1, 2, 3, 4, 5, 6, 7, 8, 9])
```

create list

In [4]:
```
my_list=[0,1,2,3,4,5]
my_list
```

Out[4]:
```
[0, 1, 2, 3, 4, 5]
```

In [5]:
```
type(my_list)
```

Out[5]:
```
list
```

In [6]:
```
arr=np.array(my_list)
arr
```

Out[6]:
```
array([0, 1, 2, 3, 4, 5])
```

In [7]:
```
print(type(arr))
print(type(my_list))
```

```
<class 'numpy.ndarray'>
<class 'list'>
```

In [8]:
```
np.arange(10)
```

Out[8]:
```
array([0, 1, 2, 3, 4, 5, 6, 7, 8, 9])
```

In [9]:
```
np.arange(10,20)
```

Out[9]:
```
array([10, 11, 12, 13, 14, 15, 16, 17, 18, 19])
```

In [10]:
```
np.arange(10,50,5)
```

Out[10]:
```
array([10, 15, 20, 25, 30, 35, 40, 45])
```

In [12]:
```
np.arange(10,30,3)
```

Out[12]:
```
array([10, 13, 16, 19, 22, 25, 28])
```

In [13]:
```
np.arange(10,30,30,3)
```

```
---------------------------------------------------------------------------
TypeError                                 Traceback (most recent call last)
Cell In[13], line 1
----> 1 np.arange(10,30,30,3)

TypeError: Cannot interpret '3' as a data type
```

In [14]:
```
np.arange(8,20)
```

Out[14]:
```
array([ 8,  9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19])
```

In [15]:
```
np.arange(20,8)
```

Out[15]:
```
array([], dtype=int32)
```

In [16]:
```
numpy.arange(-20,8)
```

```
---------------------------------------------------------------------------
NameError                                 Traceback (most recent call last)
Cell In[16], line 1
----> 1 numpy.arange(-20,8)

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

In [17]:
```
np.arange(-20,8)
```

Out[17]:
```
array([-20, -19, -18, -17, -16, -15, -14, -13, -12, -11, -10,  -9,  -8,
        -7,  -6,  -5,  -4,  -3,  -2,  -1,   0,   1,   2,   3,   4,   5,
         6,   7])
```

In [18]:
```
np.zero(3)
```

```
---------------------------------------------------------------------------
AttributeError                            Traceback (most recent call last)
Cell In[18], line 1
----> 1 np.zero(3)

File ~\anaconda3\Lib\site-packages\numpy\__init__.py:333, in __getattr__(attr)
    330     "Removed in NumPy 1.25.0"
    331     raise RuntimeError("Tester was removed in NumPy 1.25.")
--> 333 raise AttributeError("module {!r} has no attribute "
    334                      "{!r}".format(__name__, attr))

AttributeError: module 'numpy' has no attribute 'zero'
```

In [19]:
```
np.zeros(3)
```

Out[19]:
```
array([0., 0., 0.])
```

In [20]:
```
np.zeros(3,dtype=int)
```

Out[20]:
```
array([0, 0, 0])
```

In [21]:
```
np.zeros(3,dtype=str)
```

Out[21]:
```
array(['', '', ''], dtype='<U1')
```

In [22]:
```
np.zeros(3, dtype=bool)
```

Out[22]:
```
array([False, False, False])
```

In [23]:
```
np.zeros(3,dtype=complex)
```

Out[23]:
```
array([0.+0.j, 0.+0.j, 0.+0.j])
```

In [24]:
```
np.zeros(3,dtype=int,complex)
```

```
  Cell In[24], line 1
    np.zeros(3,dtype=int,complex)
                                 ^
SyntaxError: positional argument follows keyword argument
```

In [25]:
```
np.zeros(3,dtype=(int)complex)
```

```
  Cell In[25], line 1
    np.zeros(3,dtype=(int)complex)
                        ^
SyntaxError: invalid syntax. Perhaps you forgot a comma?
```

In [26]:
```
np.zeros(3, dtype=int)
```

Out[26]:
```
array([0, 0, 0])
```

In [27]:
```
np.zeros((2,2))
```

Out[27]:
```
array([[0., 0.],
       [0., 0.]])
```

In [28]:
```
np.zeros((2,2,dtype=int))
```

```
  Cell In[28], line 1
    np.zeros((2,2,dtype=int))
                  ^
SyntaxError: invalid syntax. Maybe you meant '==' or ':=' instead of '='?
```

In [29]:
```
np.zeros((2,2), dtype=int)
```

Out[29]:
```
array([[0, 0],
       [0, 0]])
```

In [30]:
```
np.zeros((3,3), dtype=int)
```

Out[30]:
```
array([[0, 0, 0],
       [0, 0, 0],
       [0, 0, 0]])
```

In [31]:
```
np.ones(3)
```

Out[31]:
```
array([1., 1., 1.])
```

In [32]:
```
np.ones(3, dtype=int)
```

Out[32]:
```
array([1, 1, 1])
```

In [33]:
```
nd1=np.ones((10,10),dtype=int)
nd1
```

Out[33]:
```
array([[1, 1, 1, 1, 1, 1, 1, 1, 1, 1],
       [1, 1, 1, 1, 1, 1, 1, 1, 1, 1],
       [1, 1, 1, 1, 1, 1, 1, 1, 1, 1],
       [1, 1, 1, 1, 1, 1, 1, 1, 1, 1],
       [1, 1, 1, 1, 1, 1, 1, 1, 1, 1],
       [1, 1, 1, 1, 1, 1, 1, 1, 1, 1],
       [1, 1, 1, 1, 1, 1, 1, 1, 1, 1],
       [1, 1, 1, 1, 1, 1, 1, 1, 1, 1],
       [1, 1, 1, 1, 1, 1, 1, 1, 1, 1],
       [1, 1, 1, 1, 1, 1, 1, 1, 1, 1]])
```

In [34]:
```
print(type(nd1))
```

```
<class 'numpy.ndarray'>
```

In [35]:
```
np.dot(3)
```

```
---------------------------------------------------------------------------
TypeError                                 Traceback (most recent call last)
Cell In[35], line 1
----> 1 np.dot(3)

TypeError: dot() missing 1 required positional argument: 'b'
```

In [36]:
```
np.dot(3,2)
```

Out[36]:
```
6
```

input function

In [ ]:

In [37]:
```
a=input()
b=input()
c=a+b
print(c)
```

```
23
```

In [ ]:

In [38]:
```
a=input('enter a value')
b=input('enter b value')
c=a+b
print(c)
```

```
24
```

In [ ]:

In [39]:
```
a=input('enter a value')
x=int(a)
b=input('enter b value')
y=int(b)
```

```
z=x+y
print(z)
```

```
4
```

In [40]:
```
a=int(input('enter a value'))
b=int(input('enter b value'))
print(c+b)
```

```
---------------------------------------------------------------------------
TypeError                                 Traceback (most recent call last)
Cell In[40], line 3
      1 a=int(input('enter a value'))
      2 b=int(input('enter b value'))
----> 3 print(c+b)

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

In [41]:
```
a=int(input('enter a value'))
b=int(input('enter b value'))
print(a+b)
```

```
8
```

In [ ]:
```

```

In [42]:
```
a=input('enter value')
print(a)
```

```
2+2*3-4/2
```

In [45]:
```
a=int(input('enter a value'))
print(a)
```

```
---------------------------------------------------------------------------
ValueError                                Traceback (most recent call last)
Cell In[45], line 1
----> 1 a=int(input('enter a value'))
      2 print(a)

ValueError: invalid literal for int() with base 10: '2+2-4'
```

In [75]:
```
ch=input('enter a char')[0]
print(ch)
```

```
n
```

In [46]:
```
a=eval(input('enter a value'))
print(a)
```

```
12
```

In [47]:
```
import math
```

In [48]:
```
math.pow(2,2)
```

Out[48]:
```
4.0
```

In [49]:
```
math.sqrt(625)
```

Out[49]:
```
25.0
```

In [50]:
```
math.floor(99.9)
```

Out[50]: 99

In [51]:
```
math.ceil(99.9)
```

Out[51]: 100

In [52]:
```
math.sqrt(13)
```

Out[52]: 3.605551275463989

In [54]:
```
round(sqrt(13))
```

```
---------------------------------------------------------------------------
NameError                                 Traceback (most recent call last)
Cell In[54], line 1
----> 1 round(sqrt(13))

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

In [55]:
```
n=math.sqrt(13)
n
```

Out[55]: 3.605551275463989

In [56]:
```
math.sqrt(round(13))
```

Out[56]: 3.605551275463989

In [57]:
```
round(sqrt(10))
```

```
---------------------------------------------------------------------------
NameError                                 Traceback (most recent call last)
Cell In[57], line 1
----> 1 round(sqrt(10))

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

In [58]:
```
math.sqrt(10)
```

Out[58]: 3.1622776601683795

In [59]:
```
round(sqrt(10))
```

```
---------------------------------------------------------------------------
NameError                                 Traceback (most recent call last)
Cell In[59], line 1
----> 1 round(sqrt(10))

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

In [60]:
```
math.round(sqrt(10))
```

```
---------------------------------------------------------------------------
AttributeError                            Traceback (most recent call last)
Cell In[60], line 1
----> 1 math.round(sqrt(10))

AttributeError: module 'math' has no attribute 'round'
```

In [61]:
```
import math as m
```

In [62]:
```
m.sqrt(10)
```

Out[62]: 3.1622776601683795

In [63]:
```
round(sqrt(10))
```

```
---------------------------------------------------------------------------
NameError                                 Traceback (most recent call last)
Cell In[63], line 1
----> 1 round(sqrt(10))

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

In [64]:
```
m.sqrt(round(10))
```

Out[64]: 3.1622776601683795

In [65]:
```
sqrt(10)
```

```
---------------------------------------------------------------------------
NameError                                 Traceback (most recent call last)
Cell In[65], line 1
----> 1 sqrt(10)

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

In [66]:
```
import math as m
```

In [67]:
```
sqrt(10)
```

```
---------------------------------------------------------------------------
NameError                                 Traceback (most recent call last)
Cell In[67], line 1
----> 1 sqrt(10)

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

In [68]:
```
pow(2,3)
```

Out[68]: 8

In [70]:
```
m.sqrt(25)
```

Out[70]: 5.0

In [71]:
```
pow(3,2)
```

Out[71]: 9

In [73]:
```
round(pow(3,2))
```

Out[73]: 9

In [74]:
```
sqrt(25)
```

```
---------------------------------------------------------------------------
NameError                                 Traceback (most recent call last)
Cell In[74], line 1
----> 1 sqrt(25)

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

In [76]:
```
from math import sqrt,pow
```

In [77]:
```
sqrt(25)
```

Out[77]: 5.0

In [78]:
```
round(sqrt(25))
```

Out[78]: 5

In [79]:
```
pow(2,2)
```

Out[79]: 4.0

In [80]:
```
round(pow(2,2))
```

Out[80]: 4

In [81]:
```
from math import *
```

In [82]:
```
ceil(4.49)
```

Out[82]: 5

In [83]:
```
floor(4.49)
```

Out[83]: 4

In [84]:
```
import numpy as np
```

In [85]:
```
np.arange(10)
```

Out[85]: array([0, 1, 2, 3, 4, 5, 6, 7, 8, 9])

In [88]:
```
np.arange(10,2)
```

Out[88]: array([], dtype=int32)

In [89]:
```
np.arange(10,20)
```

Out[89]: array([10, 11, 12, 13, 14, 15, 16, 17, 18, 19])

In [90]:
```
np.arange(10,50,5)
```

Out[90]:
```
array([10, 15, 20, 25, 30, 35, 40, 45])
```

In [91]:
```
np.zero(3)
```

```
---------------------------------------------------------------------------
AttributeError                            Traceback (most recent call last)
Cell In[91], line 1
----> 1 np.zero(3)

File ~\anaconda3\Lib\site-packages\numpy\__init__.py:333, in __getattr__(attr)
    330     "Removed in NumPy 1.25.0"
    331     raise RuntimeError("Tester was removed in NumPy 1.25.")
--> 333 raise AttributeError("module {!r} has no attribute "
    334                      "{!r}".format(__name__, attr))

AttributeError: module 'numpy' has no attribute 'zero'
```

In [92]:
```
np.zeros(3)
```

Out[92]:
```
array([0., 0., 0.])
```

In [93]:
```
np.zeros(3, dtype=int)
```

Out[93]:
```
array([0, 0, 0])
```

In [94]:
```
np.zeros((2,2))
```

Out[94]:
```
array([[0., 0.],
       [0., 0.]])
```

In [95]:
```
np.zeros((2,2),dtype=int)
```

Out[95]:
```
array([[0, 0],
       [0, 0]])
```

In [96]:
```
np.ones((5,6),dtype=int)
```

Out[96]:
```
array([[1, 1, 1, 1, 1, 1],
       [1, 1, 1, 1, 1, 1],
       [1, 1, 1, 1, 1, 1],
       [1, 1, 1, 1, 1, 1],
       [1, 1, 1, 1, 1, 1]])
```

In [ ]:
```

```