

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

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

```
In [12]: v = 5
```

```
In [10]: v
```

```
Out[10]: 5
```

```
In [15]: va = 34, 56
```

```
In [17]: va
```

```
Out[17]: (34, 56)
```

```
In [19]: va, var = 34, 56
```

```
In [21]: print(va)  
print(var)
```

```
34
```

```
56
```

```
In [23]: import sys  
sys.version
```

```
Out[23]: '3.12.7 | packaged by Anaconda, Inc. | (main, Oct 4 2024, 13:17:27) [MSC v.192  
9 64 bit (AMD64)]'
```

```
In [25]: A = 78  
b
```

```
NameError  
Cell In[25], line 2  
  1 A = 78  
----> 2 b
```

```
Traceback (most recent call last)
```

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

```
In [27]: A
```

```
Out[27]: 78
```

```
In [3]: nit = 21  
NIT
```

```
NameError  
Cell In[3], line 2  
  1 nit = 21  
----> 2 NIT
```

```
Traceback (most recent call last)
```

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

```
In [5]: nit
```

Out[5]: 21

In [7]: 1a = 67
1a

```
Cell In[7], line 1
  1a = 67
  ^
SyntaxError: invalid decimal literal
```

In [9]: a1 = 67
a1

Out[9]: 67

In [13]: 1@ = 55

```
Cell In[13], line 1
  1@ = 55
  ^
SyntaxError: invalid syntax
```

In [15]: pri\$ = 89

```
Cell In[15], line 1
  pri$ = 89
  ^
SyntaxError: invalid syntax
```

In [17]: x_train, y_train, z_train = 10,20,30,40,50

```
-----
ValueError                                                 Traceback (most recent call last)
Cell In[17], line 1
----> 1 x_train, y_train, z_train = 10,20,30,40,50

ValueError: too many values to unpack (expected 3)
```

In [19]: x_train, x_test, y_train, y_test = 10,20,30,40
x_train
x_test
y_train
y_test

Out[19]: 40

In [21]: x_train, x_test, y_train, y_test = 10,20,30,40
print(x_train)
print(x_test)
print(y_train)
print(y_test)

```
10
20
30
40
```

In [23]: IF = 90
IF

```
Out[23]: 90
```

```
In [25]: else= 88
```

```
Cell In[25], line 1
else= 88
^
SyntaxError: invalid syntax
```

```
In [27]: eLSE = 78
```

```
In [29]: eLSE
```

```
Out[29]: 78
```

```
In [31]: import keyword
keyword.kwlist
```

```
Out[31]: ['False',
'None',
'True',
'and',
'as',
'assert',
'async',
'await',
'break',
'class',
'continue',
'def',
'del',
'elif',
'else',
'except',
'finally',
'for',
'from',
'global',
'if',
'import',
'in',
'is',
'lambda',
'nonlocal',
'not',
'or',
'pass',
'raise',
'return',
'try',
'while',
'with',
'yield']
```

```
In [41]: print(len(keyword.kwlist))
```

```
In [43]: aaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaa=90  
aaaaaaaaaaaaaaaaaaaaaaa
```

NameError

Cell In[43], line 2

Traceback (most recent call last)

 1 aaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaa=90

----> 2 aaaaaaaaaaaaaaaaaaaaaaaa

NameError: name 'aaaaaaaaaaaaaaaaaaaaaa' is not defined

```
In [45]: aaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaa
```

```
Out[45]: 90
```

INT

```
In [47]: i = 2  
i
```

```
Out[47]: 2
```

```
In [49]: type(i)
```

```
Out[49]: int
```

```
In [51]: 1i = 3  
1i
```

Cell In[51], line 1

 1i = 3

 ^

SyntaxError: invalid decimal literal

```
In [53]: i1 = 43  
i1
```

```
Out[53]: 43
```

```
In [55]: f = 110.5  
f
```

```
Out[55]: 110.5
```

```
In [57]: type(f)
```

```
Out[57]: float
```

```
In [61]: f1 = 1e0  
f1
```

```
Out[61]: 1.0
```

```
In [63]: f2 = 2e1  
f2
```

```
Out[63]: 20.0
```

```
In [67]: f3 = 3e2  
f3
```

```
Out[67]: 300.0
```

BOOL

```
In [71]: import keyword  
keyword.kwlist
```

```
Out[71]: ['False',  
          'None',  
          'True',  
          'and',  
          'as',  
          'assert',  
          'async',  
          'await',  
          'break',  
          'class',  
          'continue',  
          'def',  
          'del',  
          'elif',  
          'else',  
          'except',  
          'finally',  
          'for',  
          'from',  
          'global',  
          'if',  
          'import',  
          'in',  
          'is',  
          'lambda',  
          'nonlocal',  
          'not',  
          'or',  
          'pass',  
          'raise',  
          'return',  
          'try',  
          'while',  
          'with',  
          'yield']
```

```
In [73]: b = TRUE  
b
```

```
NameError
```

```
Cell In[73], line 1
----> 1 b = TRUE
      2 b
```

```
Traceback (most recent call last)
```

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

```
In [77]: b = true
```

```
b
```

```
NameError
```

```
Cell In[77], line 1
----> 1 b = true
      2 b
```

```
Traceback (most recent call last)
```

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

```
In [91]: b1 = True
```

```
b1
```

```
Out[91]: True
```

```
In [81]: b2 = False
```

```
b2
```

```
Out[81]: False
```

```
In [83]: type(b2)
```

```
Out[83]: bool
```

```
In [85]: True+True+False-True
```

```
Out[85]: 1
```

```
In [87]: True * False
```

```
Out[87]: 0
```

```
In [93]: print(b1)
print(b2)
```

```
True
False
```

```
In [95]: b1 + b2
```

```
Out[95]: 1
```

```
In [97]: b1 - b2
```

```
Out[97]: 1
```

```
In [99]: b2-b2
```

```
Out[99]: 0
```

```
In [101... b1-b1
```

```
Out[101... 0
```

COMPLEX

```
In [108... c = 10 + 20j
```

```
In [110... type(c)
```

```
Out[110... complex
```

```
In [112... c.real
```

```
Out[112... 10.0
```

```
In [114... c.imag
```

```
Out[114... 20.0
```

```
In [116... c1 = 5 + 5j  
c1
```

```
Out[116... (5+5j)
```

```
In [118... c + c1
```

```
Out[118... (15+25j)
```

```
In [120... c - c1
```

```
Out[120... (5+15j)
```

```
In [122... print(c)  
print(c1)
```

```
(10+20j)  
(5+5j)
```

```
In [126... c2 = 10-2.5j  
c2
```

```
Out[126... (10-2.5j)
```

```
In [124... c3 = 2.0 + 34j  
c3
```

```
Out[124... (2+34j)
```

```
In [137... s = 'sdfsaf'  
s
```

```
Out[137... 'sdfsaf'
```

```
In [138... s1 = "sdfsdfsdfd"
s1
```

```
Out[138... 'sdfsdfsdfd'
```

```
In [134... s2 = '''ASDasas'''
s2
```

```
Out[134... 'ASDasas'
```

Type Casting or Type Conversion

```
In [141... int(2.3)
```

```
Out[141... 2
```

```
In [143... int(2.7)
```

```
Out[143... 2
```

```
In [145... int(2.3, 7.3)
```

TypeError Traceback (most recent call last)
Cell In[145], line 1
----> 1 int(2.3, 7.3)

TypeError: 'float' object cannot be interpreted as an integer

```
In [147... int(True)
```

```
Out[147... 1
```

```
In [149... int('10')
```

```
Out[149... 10
```

```
int('ten')
```

```
In [153... int(1 + 2j)
```

TypeError Traceback (most recent call last)
Cell In[153], line 1
----> 1 int(1 + 2j)

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

we cannot type cast from complex to int, rest is possible(String should be a number)

```
In [155... float(10)
```

```
Out[155... 10.0
```

```
In [157... float(20)
```

```
Out[157... 20.0
```

```
In [159... float('twenty')
```

```
ValueError Traceback (most recent call last)
Cell In[159], line 1
----> 1 float('twenty')

ValueError: could not convert string to float: 'twenty'
```

```
In [161... float(10-20j)
```

```
TypeError Traceback (most recent call last)
Cell In[161], line 1
----> 1 float(10-20j)

TypeError: float() argument must be a string or a real number, not 'complex'
```

we cannot type cast from complex to float, rest is possible(String should be a number)

```
In [168... print(bool(9))
print(bool(9.9))
print(bool('9'))
print(bool(1+2j))
print(bool(_))
print(bool())
```

```
True
True
True
True
True
False
```

```
In [170... print(bool())
```

```
False
```

```
In [172... print(bool(0))
```

```
False
```

we can type cast from any data type to bool

```
In [175... str(2)
```

```
Out[175... '2'
```

```
In [177... str(2.2)
```

```
Out[177... '2.2'
```

```
In [179... str(True)
```

```
Out[179... 'True'
```

```
In [181... str(False)
```

```
Out[181... 'False'
```

```
In [183... True + True
```

```
Out[183... 2
```

```
In [186... str(10 + 20j)
```

```
Out[186... '(10+20j)'
```

we can typecast from any other datatype to String

```
In [189... print(len('milk')) != print(len('meato'))
```

```
4  
5
```

```
Out[189... False
```

```
In [191... com = 'milk'  
print(com[0])  
print(com[1])  
print(com[2])  
print(com[3])  
print(com[4])
```

```
m  
i  
l  
k
```

```
-----  
IndexError  
Cell In[191], line 6  
    4 print(com[2])  
    5 print(com[3])  
----> 6 print(com[4])
```

Traceback (most recent call last)

```
IndexError: string index out of range
```

String Indexing

```
In [196... s7 = 'nareshit'
```

```
s7
```

```
Out[196... 'nareshit'
```

```
In [198... s7[0]
```

```
Out[198... 'n'
```

```
In [200... s7[1]
```

```
Out[200... 'a'
```

```
In [202... s7[10]
```

```
-----  
IndexError  
Cell In[202], line 1  
----> 1 s7[10]
```

Traceback (most recent call last)

```
IndexError: string index out of range
```

```
In [204... s7
```

```
Out[204... 'nareshit'
```

```
In [206... s7[-3]
```

```
Out[206... 'h'
```

```
In [208... s7[-9]
```

```
-----  
IndexError  
Cell In[208], line 1  
----> 1 s7[-9]
```

Traceback (most recent call last)

```
IndexError: string index out of range
```

```
In [210... s7[-8]
```

```
Out[210... 'n'
```

```
In [212... s7[8]
```

```
-----  
IndexError  
Cell In[212], line 1  
----> 1 s7[8]
```

Traceback (most recent call last)

```
IndexError: string index out of range
```

```
In [214... for i in s7:  
      print(i)
```

```
n  
a  
r  
e  
s  
h  
i  
t
```

```
In [216... s7
```

```
Out[216... 'nareshit'
```

```
In [218... s8 = 'abcdefghijkl'
s8
```

```
Out[218... 'abcdefghijkl'
```

```
In [220... s8[2:7]
```

```
Out[220... 'cdefg'
```

```
In [222... s8[0:9]
```

```
Out[222... 'abcdefghijkl'
```

```
In [224... s8[1:-4]
```

```
Out[224... 'bcde'
```

```
In [226... step_indexing = [1,2,3,4,5,6,7,8,9,10]
step_indexing
```

```
Out[226... [1, 2, 3, 4, 5, 6, 7, 8, 9, 10]
```

```
In [228... step_indexing[2: 9:4]
```

```
Out[228... [3, 7]
```

```
In [230... step_indexing[1: 8:2]
```

```
Out[230... [2, 4, 6, 8]
```

```
In [232... step_indexing[:]
```

```
Out[232... [1, 2, 3, 4, 5, 6, 7, 8, 9, 10]
```

```
In [242... l1 = l.reverse()
l1
```

```
In [250... l = [10, 20, 30, 40]
```

```
In [252... l1 = l.reverse()
l1
```

BIT WISE NUMBER SYSTEM(29th)

```
In [255... 25
```

```
Out[255... 25
```

```
In [259... int(0b11001)
```

```
Out[259... 25
```

```
In [261... bin(35)
```

```
Out[261... '0b100011'
```

```
In [263... int(0b100011)
```

```
Out[263... 35
```

```
In [265... oct(30)
```

```
Out[265... '0o36'
```

```
In [267... oct(25)
```

```
Out[267... '0o31'
```

```
In [269... hex(7)
```

```
Out[269... '0x7'
```

```
In [273... 0xa
```

```
Out[273... 10
```

```
In [277... 0xb
```

```
Out[277... 11
```

```
In [275... 0xc
```

```
Out[275... 12
```

```
In [279... hex(256)
```

```
Out[279... '0x100'
```

```
In [281... int(0x100)
```

```
Out[281... 256
```

```
In [283... 1
```

```
Out[283... [40, 30, 20, 10]
```

```
In [285... 11
```

NameError
Cell In[285], line 1
----> 1 11

Traceback (most recent call last)

NameError: name 'l1' is not defined

```
In [287... 12
```

```
NameError
```

```
Cell In[287], line 1
----> 1 12
```

```
Traceback (most recent call last)
```

```
NameError: name '12' is not defined
```

```
In [289...]: 1 = [40, 30, 20, 10]
1
```

```
Out[289...]: [40, 30, 20, 10]
```

```
In [301...]: 11 = [70, 2.3, True, 1+2j,[10,20,30]]
11
```

```
Out[301...]: [70, 2.3, True, (1+2j), [10, 20, 30]]
```

```
In [303...]: 11.append([70, 2.3, True, 1+2j,[10,20,30]])
11
```

```
Out[303...]: [70, 2.3, True, (1+2j), [10, 20, 30], [70, 2.3, True, (1+2j), [10, 20, 30]]]
```

```
In [305...]: 11.append([70, 2.3, True, 1+2j,[10,20,30]])
11
```

```
Out[305...]: [70,
 2.3,
 True,
 (1+2j),
 [10, 20, 30],
 [70, 2.3, True, (1+2j), [10, 20, 30]],
 [70, 2.3, True, (1+2j), [10, 20, 30]]]
```

```
In [309...]: 12 = 11
12
```

```
Out[309...]: [70,
 2.3,
 True,
 (1+2j),
 [10, 20, 30],
 [70, 2.3, True, (1+2j), [10, 20, 30]],
 [70, 2.3, True, (1+2j), [10, 20, 30]]]
```

```
In [313...]: del 12
```

```
In [317...]: 12 = [70]
12
```

```
Out[317...]: [70]
```

```
In [321...]: 12.clear()
```

```
In [323...]: 12
```

```
Out[323...]: []
```

```
In [325...]: 12.append(70)
```

```
In [327...]: 12
```

```
Out[327...]: [70]
```

```
In [347...]: 12.append(70)
12.append(2.3)
12.append(True)
12.append((1+2j))
12.append([10, 20, 30])
12.append(70)
12.append(2.3)
12.append(True)
12.append((1+2j))
12.append([10, 20, 30])
12.append(70)
12.append(2.3)
12.append(True)
12.append((1+2j))
12.append([10, 20, 30])
```

```
In [349...]: 12
```

```
Out[349...]: [70,
 70,
 2.3,
 True,
 (1+2j),
 [10, 20, 30],
 70,
 2.3,
 True,
 (1+2j),
 [10, 20, 30],
 70,
 2.3,
 True,
 (1+2j),
 [10, 20, 30]]
```

```
In [351...]: 12.count(70)
```

```
Out[351...]: 4
```

```
In [353...]: 12[:]
```

```
Out[353... [70,  
70,  
2.3,  
True,  
(1+2j),  
[10, 20, 30],  
70,  
2.3,  
True,  
(1+2j),  
[10, 20, 30],  
70,  
2.3,  
True,  
(1+2j),  
[10, 20, 30]]
```

```
In [355... 12[:5]
```

```
Out[355... [70, 70, 2.3, True, (1+2j)]
```

```
In [357... 1[:5]
```

```
Out[357... [40, 30, 20, 10]
```

```
In [359... 1[:,-1]
```

```
Out[359... [40, 30, 20]
```

```
In [363... 1[:,-2]
```

```
Out[363... [40, 30]
```

```
In [365... 1[::,-3]
```

```
Out[365... [10, 40]
```

```
In [367... 1.index(20)
```

```
Out[367... 2
```

```
In [369... 12
```

```
Out[369... [70,  
70,  
2.3,  
True,  
(1+2j),  
[10, 20, 30],  
70,  
2.3,  
True,  
(1+2j),  
[10, 20, 30],  
70,  
2.3,  
True,  
(1+2j),  
[10, 20, 30]]
```

```
In [371... id(12)
```

```
Out[371... 2195340288320
```

```
In [373... len(12)
```

```
Out[373... 16
```

```
In [375... 12.clear()
```

```
In [379... 12
```

```
Out[379... []
```

```
In [381... id(12)
```

```
Out[381... 2195340288320
```

```
In [383... del(12)
```

```
In [385... 12
```

NameError

Cell In[385], line 1
----> 1 12

Traceback (most recent call last)

NameError: name '12' is not defined

```
In [387... 11
```

```
Out[387... [70,  
2.3,  
True,  
(1+2j),  
[10, 20, 30],  
[70, 2.3, True, (1+2j), [10, 20, 30]],  
[70, 2.3, True, (1+2j), [10, 20, 30]]]
```

```
In [389... 11.clear()
```

```
In [391...]: l1 = [70,  
          70,  
          2.3,  
          True,  
          (1+2j),  
          [10, 20, 30],  
          70,  
          2.3,  
          True,  
          (1+2j),  
          [10, 20, 30],  
          70,  
          2.3,  
          True,  
          (1+2j),  
          [10, 20, 30]]
```

```
In [393...]: l1
```

```
Out[393...]: [70,  
              70,  
              2.3,  
              True,  
              (1+2j),  
              [10, 20, 30],  
              70,  
              2.3,  
              True,  
              (1+2j),  
              [10, 20, 30],  
              70,  
              2.3,  
              True,  
              (1+2j),  
              [10, 20, 30]]
```

```
In [395...]: l1.pop()
```

```
Out[395...]: [10, 20, 30]
```

```
In [397...]: l1
```

```
Out[397...]: [70,  
              70,  
              2.3,  
              True,  
              (1+2j),  
              [10, 20, 30],  
              70,  
              2.3,  
              True,  
              (1+2j),  
              [10, 20, 30],  
              70,  
              2.3,  
              True,  
              (1+2j)]
```

```
In [399... 12 = l.copy()
```

```
In [401... 12
```

```
Out[401... [40, 30, 20, 10]
```

```
In [403... 12.remove(20)
```

```
In [405... 12
```

```
Out[405... [40, 30, 10]
```

```
In [407... 12.pop(1)
```

```
Out[407... 30
```

```
In [409... 12.pop(-1)
```

```
Out[409... 10
```

```
In [411... 12.insert(1,25)
```

```
In [413... 12
```

```
Out[413... [40, 25]
```

```
In [415... 12.pop()
```

```
Out[415... 25
```

```
In [417... 12.insert(2,25)
```

```
In [419... 12
```

```
Out[419... [40, 25]
```

```
In [421... 1
```

```
Out[421... [40, 30, 20, 10]
```

```
In [423... 1[0]
```

```
Out[423... 40
```

```
In [425... 1[0] = 400
```

```
In [427... 1
```

```
Out[427... [400, 30, 20, 10]
```

```
In [429... 11
```

```
Out[429... [70,  
70,  
2.3,  
True,  
(1+2j),  
[10, 20, 30],  
70,  
2.3,  
True,  
(1+2j),  
[10, 20, 30],  
70,  
2.3,  
True,  
(1+2j)]
```

```
In [431... len(l1)
```

```
Out[431... 15
```

```
In [433... len(l2)
```

```
Out[433... 2
```

```
In [435... l2.extend(l1)
```

```
In [437... 12
```

```
Out[437... [40,  
25,  
70,  
70,  
2.3,  
True,  
(1+2j),  
[10, 20, 30],  
70,  
2.3,  
True,  
(1+2j),  
[10, 20, 30],  
70,  
2.3,  
True,  
(1+2j)]
```

```
In [439... len(l2)
```

```
Out[439... 17
```

```
In [441... for i in l2:  
    print(i)
```

```
40
25
70
70
2.3
True
(1+2j)
[10, 20, 30]
70
2.3
True
(1+2j)
[10, 20, 30]
70
2.3
True
(1+2j)
```

In [443...]:

```
for i in enumerate(l2):
    print(i)
```

```
(0, 40)
(1, 25)
(2, 70)
(3, 70)
(4, 2.3)
(5, True)
(6, (1+2j))
(7, [10, 20, 30])
(8, 70)
(9, 2.3)
(10, True)
(11, (1+2j))
(12, [10, 20, 30])
(13, 70)
(14, 2.3)
(15, True)
(16, (1+2j))
```

In [445...]:

```
12
```

Out[445...]:

```
[40,
 25,
 70,
 70,
 2.3,
 True,
 (1+2j),
 [10, 20, 30],
 70,
 2.3,
 True,
 (1+2j),
 [10, 20, 30],
 70,
 2.3,
 True,
 (1+2j)]
```

30th

```
In [451... np.nan
```

```
NameError  
Cell In[451], line 1  
----> 1 np.nan
```

```
Traceback (most recent call last)
```

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

```
In [453... import numpy as np  
npp = np.nan
```

```
In [455... type(npp)
```

```
Out[455... float
```

```
In [457... l
```

```
Out[457... [400, 30, 20, 10]
```

```
In [459... l.sort()
```

```
In [461... l
```

```
Out[461... [10, 20, 30, 400]
```

```
In [ ]: l.sort(reverse = True)
```

```
In [463... l
```

```
Out[463... [10, 20, 30, 400]
```

```
In [465... 15 = ['a', 'u', 's']
```

```
In [467... 15
```

```
Out[467... ['a', 'u', 's']
```

```
In [471... 15.sort(reverse = True)
```

```
In [ ]: 15
```

```
In [473... 15.sort(reverse = False)
```

```
In [475... 15
```

```
Out[475... ['a', 's', 'u']
```

```
In [477... 12
```

```
Out[477... [40,
25,
70,
70,
2.3,
True,
(1+2j),
[10, 20, 30],
70,
2.3,
True,
(1+2j),
[10, 20, 30],
70,
2.3,
True,
(1+2j)]
```

```
In [479... 12.sort()
```

TypeError Traceback (most recent call last)
Cell In[479], line 1
----> 1 12.sort()
TypeError: '<' not supported between instances of 'complex' and 'int'

```
In [481... a = 3
b = 5
c = a + b
c
```

```
Out[481... 8
```

```
In [483... int_add_(3,2)
```

NameError Traceback (most recent call last)
Cell In[483], line 1
----> 1 int_add_(3,2)
NameError: name 'int_add_' is not defined

```
In [485... int.__add__(3,2)
```

```
Out[485... 5
```

```
In [487... int.__sub__(3,2)
```

```
Out[487... 1
```

```
In [489... int.__mul__(3,2)
```

```
Out[489... 6
```

```
In [491... float.__sub__(3.3, 2.2)
```

```
Out[491... 1.0999999999999996
```

```
In [493... int_a_b
```

```
NameError  
Cell In[493], line 1  
----> 1 int_a_b
```

```
Traceback (most recent call last)
```

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

```
In [495... int._sub_(3,2)
```

```
AttributeError  
Cell In[495], line 1  
----> 1 int._sub_(3,2)
```

```
Traceback (most recent call last)
```

```
AttributeError: type object 'int' has no attribute '_sub_'
```

```
In [497... int._mul_(3,2)
```

```
AttributeError  
Cell In[497], line 1  
----> 1 int._mul_(3,2)
```

```
Traceback (most recent call last)
```

```
AttributeError: type object 'int' has no attribute '_mul_'
```

```
In [499... float._sub_(3.3, 1.1)
```

```
AttributeError  
Cell In[499], line 1  
----> 1 float._sub_(3.3, 1.1)
```

```
Traceback (most recent call last)
```

```
AttributeError: type object 'float' has no attribute '_sub_'
```

```
In [ ]:
```