In [3]:

```
1 print(1)
```

```
1
```

In [4]:

```
1 print(1.2)
```

```
1.2
```

In [5]:

```
1 print(1+1.2)
```

```
2.2
```

In [6]:

```
1 1+3
```

Out[6]:

```
4
```

In [7]:

```
1 print("Hello World!")
```

```
Hello World!
```

In [8]:

```
1 print("1+3")
```

```
1+3
```

In [9]:

```
1 True
```

Out[9]:

```
True
```

In [10]:

```
1 False
```

Out[10]:

```
False
```

In [11]:

```
1 x = 5
```

In [12]:

```
print(x)
```

```
5
```

In [13]:

```
x
```

Out[13]:

```
5
```

In [14]:

```
type(x)
```

Out[14]:

```
int
```

In [16]:

```
y = 1.5
type(y)
```

Out[16]:

```
float
```

In [18]:

```
print(type(y)) # after oops
```

```
<class 'float'>
```

In [19]:

```
s = "hello"
```

In [20]:

```
type(s)
```

Out[20]:

```
str
```

In [21]:

```
x
```

Out[21]:

```
5
```

In [22]:

```
x = 1.5
```

In [23]:

```
1 x
```

Out[23]:

```
1.5
```

In [24]:

```
1 type(x)
```

Out[24]:

```
float
```

In [25]:

```
1 8 / 3
```

Out[25]:

```
2.6666666666666665
```

In [26]:

```
1 - 8 / 3
```

Out[26]:

```
-2.6666666666666665
```

In [27]:

```
1 8 // 3
```

Out[27]:

```
2
```

In [ ]:

```
1 - 8 // 3
```

In [28]:

```
1 - 8 // 5
```

Out[28]:

```
-2
```

In [29]:

```
1 - 3 // 2
```

Out[29]:

```
-2
```

In [30]:

```
5 % 2
```

Out[30]:

```
1
```

In [31]:

```
2 ** 3
```

Out[31]:

```
8
```

In [40]:

```
age = 17

if age >= 18:
    print("Eligible")
elif age >= 16 and age < 18:
    if age == 17:
        print("Mohammed Emran loves you")
else:
    print("Not Eligible")
```

```
Mohammed Emran loves you
```

In [ ]:

```
# age = input()

# if age >= 18
# {

# }
```

In [49]:

```
age = 23
if age >= 18:
    print(age)
```

```
23
```

In [50]:

```
signal = "green"
if signal == "red":
    print("stop")
else:
    print("go")
```

```
go
```

In [51]:

```
signal = "green"
print("stop") if signal == "red" else print("go")
```

```
go
```

In [53]:

```
# loops - for, while
```

In [55]:

```
list(range(1, 5))
```

Out[55]:

```
[1, 2, 3, 4]
```

In [56]:

```
for num in range(1, 5):
    print(num)
```

```
1
2
3
4
```

In [60]:

```
range(1, 5) # generator - to be discussed later
```

Out[60]:

```
range(1, 5)
```

In [62]:

```
# print first 5 even numbers
```

In [65]:

```
cnt = 0
for num in range(1, 1000):
    if num % 2 == 0:
        cnt += 1
        if cnt <= 5:
            print(num)
```

```
2
4
6
8
10
```

In [67]:

```
cnt = 0
for num in range(1, 1000):
    if num % 2 == 0:
        cnt += 1
        if cnt <= 5:
            print(num)
        else:
            break
```

```
2
4
6
8
10
```

In [70]:

```
for num in range(2, 11, 2):
    print(num)
```

```
2
4
6
8
10
```

In [71]:

```
list(range(5))
```

Out[71]:

```
[0, 1, 2, 3, 4]
```

In [72]:

```
# x - [0, x)
# x, y --> [x, y)
# x, y, z --> [x, y), +z
```

In [74]:

```
for num in range(10, 0, -1):
    print(num)
```

```
10
9
8
7
6
5
4
3
2
1
```

In [75]:

```
1 cmd = input("Enter command:")
```

```
Enter command:ls
```

In [76]:

```
1 cmd
```

Out[76]:

```
'ls'
```

In [77]:

```
1 cmd = input("Enter command:")
```

```
Enter command:123
```

In [78]:

```
1 cmd
```

Out[78]:

```
'123'
```

In [79]:

```
1 int('123')
```

Out[79]:

```
123
```

In [80]:

```
1 int(input("Enter command:"))
```

```
Enter command:123
```

Out[80]:

```
123
```

In [81]:

```
1 float('123')
```

Out[81]:

```
123.0
```

In [83]:

```
cmd = input("Enter command:")
while cmd != "exit":
    cmd = input("Enter command:")
    print(cmd)
```

```
Enter command:ls
Enter command:something
something
Enter command:something else
something else
Enter command:else else
else else
Enter command:exit
exit
```

In [84]:

```
def is_even(num):
    return num % 2 == 0
```

In [85]:

```
# lists
```

In [86]:

```
marks = [90, 100, 30, 85, 60, "absent"]
```

In [87]:

```
type(marks)
```

Out[87]:

```
list
```

In [88]:

```
[90, 100, 30, 85, 60, 1.5]
```

Out[88]:

```
[90, 100, 30, 85, 60, 1.5]
```

In [ ]:

```
[90, 100, 30, 85, 60, [1.5]]
```

In [89]:

```
# indexing
```

In [91]:

```
marks[1]
```

Out[91]:

```
100
```

In [92]:

```
marks[3]
```

Out[92]:

```
85
```

In [93]:

```
marks[-3]
```

Out[93]:

```
85
```

In [94]:

```
# slicing
```

In [95]:

```
marks[1:4]
```

Out[95]:

```
[100, 30, 85]
```

In [96]:

```
marks[:4]
```

Out[96]:

```
[90, 100, 30, 85]
```

In [97]:

```
marks[::2]
```

Out[97]:

```
[90, 30, 60]
```

In [98]:

```
marks[:]
```

Out[98]:

```
[90, 100, 30, 85, 60, 'absent']
```

In [100]:

```
1 marks[::-1]
```

Out[100]:

```
['absent', 60, 85, 30, 100, 90]
```

In [101]:

```
1 len(marks)
```

Out[101]:

```
6
```

In [102]:

```
1 max(marks)
```

```
---------------------------------------------------------------------------
TypeError                                 Traceback (most recent call
 last)
<ipython-input-102-e9b62b81b60b> in <module>
----> 1 max(marks)

TypeError: '>' not supported between instances of 'str' and 'int'
```

In [103]:

```
1 marks = [90, 100, 30, 85, 60]
```

In [104]:

```
1 max(marks)
```

Out[104]:

```
100
```

In [105]:

```
1 sum(marks)
```

Out[105]:

```
365
```

In [106]:

```
sum(['absent', 60, 85, 30, 100, 90])
```

```
---------------------------------------------------------------------------
TypeError                                 Traceback (most recent call
 last)
<ipython-input-106-eadb1e30b23a> in <module>
----> 1 sum(['absent', 60, 85, 30, 100, 90])

TypeError: unsupported operand type(s) for +: 'int' and 'str'
```

In [107]:

```
[1, 2, 3] + [4, 5, 6] # concatenate
```

Out[107]:

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

In [108]:

```
[1, 2, 3] * 3
```

Out[108]:

```
[1, 2, 3, 1, 2, 3, 1, 2, 3]
```

In [109]:

```
[1, 2, 3] * [4, 5, 6]
```

```
---------------------------------------------------------------------------
TypeError                                 Traceback (most recent call
 last)
<ipython-input-109-fde107a94d11> in <module>
----> 1 [1, 2, 3] * [4, 5, 6]

TypeError: can't multiply sequence by non-int of type 'list'
```

In [110]:

```
for element in marks:
    print(element)
```

```
90
100
30
85
60
```

In [112]:

```
for idx in range(0, len(marks)):
    print(idx, marks[idx])
```

```
0 90
1 100
2 30
3 85
4 60
```

In [167]:

```
for element in enumerate(marks):
    print(element)
```

```
(0, 1)
(1, 2)
(2, 3)
(3, 4)
```

In [122]:

```
a = [10, 20, 30]
b = a
c = [10, 20, 30]
d = list(a) # list() creates a sep copy
e = a[:] # slicing also creates a sep copy
f = a.copy()
```

In [145]:

```
print(a == a)
print(a == b)
print(a == c)
print(a == d)
print(a == e)
print(a == f)
```

```
True
True
True
True
True
True
```

In [146]:

```
a[0] = 100
```

In [147]:

```
a
```

Out[147]:

```
[100, 20, 30]
```

In [148]:

```
print(a == a)
print(a == b)
print(a == c)
print(a == d)
print(a == e)
print(a == f)
```

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

In [127]:

```
id(a)
```

Out[127]:

```
140334840161088
```

In [128]:

```
id(b)
```

Out[128]:

```
140334840161088
```

In [129]:

```
id(c)
```

Out[129]:

```
140334840198400
```

In [130]:

```
id(d)
```

Out[130]:

```
140334048892800
```

In [131]:

```
id(e)
```

Out[131]:

```
140334840090432
```

In [137]:

```
a = [10, 20, 30]
b = a
c = [10, 20, 30]
d = list(a) # list() creates a sep copy
e = a[:] # slicing also creates a sep copy
```

In [138]:

```
print(a == a)
print(a == b)
print(a == c)
print(a == d)
print(a == e)
```

```
True
True
True
True
True
```

In [139]:

```
print(a is a)
```

```
True
```

In [140]:

```
print(a is b)
```

```
True
```

In [141]:

```
print(a is c)
```

```
False
```

In [142]:

```
print(a is d)
```

```
False
```

In [143]:

```
print(a is e)
```

```
False
```

In [149]:

```
# nested lists
```

In [150]:

```
mat = [[1, 2], [3, 4]]
```

In [151]:

```
1 mat
```

Out[151]:

```
[[1, 2], [3, 4]]
```

In [ ]:

```
1 mat[0]
```

In [ ]:

```
1 # 3
```

In [153]:

```
1 mat[1][0]
```

Out[153]:

```
3
```

In [154]:

```
1 mat * 2
```

Out[154]:

```
[[1, 2], [3, 4], [1, 2], [3, 4]]
```

In [156]:

```
1 marks = [1, 2, 3, 4]
```

In [ ]:

```
1 # [1, 2, 3, 4] * 2
```

In [155]:

```
1 [1, 2, 3, 4] * 2
```

Out[155]:

```
[1, 2, 3, 4, 1, 2, 3, 4]
```

In [159]:

```
1 result = []
2 for num in marks:
3     result.append(num * 2)
```

In [160]:

```
result
```

Out[160]:

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

In [161]:

```
[num*2 for num in marks] # list comprehension
```

Out[161]:

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

In [162]:

```
# first 10 sqaures - 1, 4, 9, 16, 25...
[num**2 for num in marks]
```

Out[162]:

```
[1, 4, 9, 16]
```

In [163]:

```
# take the power of 3, if its even or odd, same number, +1
```

In [165]:

```
def fn(num):
    num_2 = num**3
    if num_2 % 2 == 0:
        return num_2
    else:
        return num_2 + 1
```

In [166]:

```
[fn(num) for num in marks]
```

Out[166]:

```
[2, 8, 28, 64]
```

In [173]:

```
-8 % 3
```

Out[173]:

```
1
```

In [169]:

```
type(print(5))
```

```
5
```

Out[169]:

```
NoneType
```

In [170]:

```
x = print(5)
```

```
5
```

In [172]:

```
print(x)
```

```
None
```

In [174]:

```
3.3 - 3.2
```

Out[174]:

```
0.09999999999999964
```

In [175]:

```
-8 % 3
```

Out[175]:

```
1
```

In [176]:

```
-8 == -3*3 + 1
```

Out[176]:

```
True
```

In [177]:

```
-8 == -2*3 - 2
```

Out[177]:

```
True
```