In [4]:
```
#Sample Program
#Create a list that will store square of number from 1 to 10
empty_list=[]
for i in range(1,11):
    empty_list.append(i**2)
empty_list
```

Out[4]:
```
[1, 4, 9, 16, 25, 36, 49, 64, 81, 100]
```

In [ ]:
```
#List Comprehensions
it is a easy way and compact way of creating the list objects based on the given condition
```

In [9]:
```
#Syntax of list comphersion
#empty_list = [expression for item in sequence(list) if condition]
empty_list=[i**2 for i in range(1,11)]
empty_list
```

Out[9]:
```
[4, 16, 36, 64, 100]
```

In [10]:
```
empty_list=[2**i for i in range(1,11) if i%2==0 if ]
empty_list
```

Out[10]:
```
[4, 16, 64, 256, 1024]
```

In [11]:
```
#Nested List
#list inside list
n=[10,20,[30,40]]
print(n[2][0])
print(n[2][1])
print(n[2])
```

```
30
40
[30, 40]
```

In [22]:
```
#Nested List
#list inside list
n=[10,[20,56,67,67],["Virat Kohli","Rohit sHARAMA", [12,34,56]],[30,40,[1,2,3]]]
print(n[-1][-1][-1])
n[::3]
```

```
3
```

Out[22]:
```
[10, [30, 40, [1, 2, 3]]]
```

In [20]:
```

```

```
56
```

In [32]:
```
x=[[10,20],[10,20,30,40],[10,20,30,40,50,60]]
print(len(x))
for i in range(len(x)):
    for j in range(len(x[i])):
        print(x[i][j],end=" ")
    print()
```

```
3
12
```

In [34]:
```
x=[[10,20],[10,20,30,40],[10,20,30,40,50,60]]
count=0
print(len(x))
for i in range(len(x)):
    for j in range(len(x[i])):
        count=count+1
print(count)
```

```
3
12
```

In [37]:
```
x=[10,20,30]
x.append([10,20,30])
x
```

Out[37]:
```
[10, 20, 30, [10, 20, 30]]
```

In [35]:
```
#how to take list as an input from the user
input_list = [int(x) for x in input().split()]

print(input_list)
```

```
10 20 30 40 50 60
[10, 20, 30, 40, 50, 60]
```

In [39]:
```
#how to take list as an input from the user
input_list = [int(x) for x in input().split()]
input_list1 =[int(x) for x in input().split()]
input_list.insert(1, input_list1)
print(input_list)
```

```
10 29
12 12 234
[10, [12, 12, 234], 29]
```

In [ ]:
```
#Introduction to Dictionary
we get to know about tuple, lists
if we want to represnt a group of element in the form key value pair then we should go for dictionary.
name:Pratyush
roll no:102
address: delhi
```

In [ ]:
```
#Properties of a Dictionary:
1.keys are not duplicates but values are duplicates
2.Disimilar objects are allowed for both key and value.
3.Indexing is not important that means dictionary are unordered.
4.Dictionaries are mutable
5.indexing and slicing concept is not applicable in case of dicitonary
```

In [ ]:
```
#How to create dictionary object
d={} #empty dictionary
d=dict() #empty dictionary
```

In [41]:
```
#We can add entries like below
d={}
d["name"]="Pratyush"
d["City"]="Delhi"
d["Mobile Number"]="987654321"
d
```

Out[41]:
```
{'name': 'Pratyush', 'City': 'Delhi', 'Mobile Number': '987654321'}
```

In [43]:
```
#if you want to access the data from the dicitonary you can do with the help of keys
d={'name': 'Pratyush', 'City': 'Delhi', 'Mobile Number': '987654321'}
d["City"]
d["Mobile Number"]
```

Out[43]:
```
'987654321'
```

In [44]:
```
d={'name': 'Pratyush', 'City': 'Delhi', 'Mobile Number': '987654321'}
d["City"]
d[100] #Key Error
```

```
---------------------------------------------------------------------------
KeyError                                  Traceback (most recent call last)
Input In [44], in <cell line: 3>()
      1 d={'name': 'Pratyush', 'City': 'Delhi', 'Mobile Number': '987654321'}
      2 d["City"]
----> 3 d[100]

KeyError: 100
```

In [51]:
```
#Update the dictionary
d={'name': 'Pratyush', 'City': 'Delhi', 'Mobile Number': '987654321'}
print(d)
d["City"]=["Chandigarh","Shimla"]
#d["City"]="Mumbai"
d["100"]="200"
print(d)
```

```
{'name': 'Pratyush', 'City': 'Delhi', 'Mobile Number': '987654321'}
{'name': 'Pratyush', 'City': ['Chandigarh', 'Shimla'], 'Mobile Number': '987654321', '100': '200'}
```

In [ ]:
```
#Delete elements from the dictionary
1.del d[key]
```

In [52]:
```
#Deletion the dictionary
d={'name': 'Pratyush', 'City': 'Delhi', 'Mobile Number': '987654321'}
del d["City"]
print(d)
```

```
{'name': 'Pratyush', 'Mobile Number': '987654321'}
```

In [53]:
```
#1. d.clear()
#Deletion the dictionary
d={'name': 'Pratyush', 'City': 'Delhi', 'Mobile Number': '987654321'}
print(d)
d.clear()
print(d)
```

```
{'name': 'Pratyush', 'City': 'Delhi', 'Mobile Number': '987654321'}
{}
```

In [55]:
```
#3. del d
d={'name': 'Pratyush', 'City': 'Delhi', 'Mobile Number': '987654321'}
print(d)
del d
print(d)
```

```
{'name': 'Pratyush', 'City': 'Delhi', 'Mobile Number': '987654321'}
```

```
---------------------------------------------------------------------------
NameError                                 Traceback (most recent call last)
Input In [55], in <cell line: 5>()
      3 print(d)
      4 del d
----> 5 print(d)

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

Important functions related to dictionary

In [56]:
```
#1.dict() --> to create a dictionary
d=dict()
d["name"]="Pratyush"
d["City"]="Delhi"
d["Mobile Number"]="987654321"
d
```

Out[56]:
```
{'name': 'Pratyush', 'City': 'Delhi', 'Mobile Number': '987654321'}
```

In [57]:
```
#len()--> number of items in dictioanry
d={'name': 'Pratyush', 'City': 'Delhi', 'Mobile Number': '987654321'}
print(len(d))
```

```
3
```

In [ ]:
```
#clear()--> it will deleted all the items of the dictioanry
```

In [61]:
```
#get()-->to get the value asscoiated the key
d={'name': 'Pratyush', 'City': 'Delhi', 'Mobile Number': '987654321'}
print(d.get('City'))
```

```
Delhi
```

In [62]:
```
#pop()-->return the deleted element based on the given key
d={'name': 'Pratyush', 'City': 'Delhi', 'Mobile Number': '987654321'}
print(d.pop("City"))
print(d)
```

```
Delhi
{'name': 'Pratyush', 'Mobile Number': '987654321'}
```

In [68]:
```
#popitem()
d={'name': 'Pratyush', 'City': 'Delhi', 'Mobile Number': '987654321'}
print(d.popitem())
print(d)
```

```
('Mobile Number', '987654321')
{'name': 'Pratyush', 'City': 'Delhi'}
```

In [69]:
```
#keys()
d={'name': 'Pratyush', 'City': 'Delhi', 'Mobile Number': '987654321'}
print(d.keys())
print(d)

dict_keys(['name', 'City', 'Mobile Number'])
{'name': 'Pratyush', 'City': 'Delhi', 'Mobile Number': '987654321'}
```

In [75]:
```
append()
extend()
insert()
```

```
Hello
False
```

In [ ]:
```

```