In [7]:
```
names=['Ramesh','Suresh','Mahesh']
       #0          1        2
age=[20,22,24]
   # 0  1  2
# ramesh age is 20
# suresh age is 22
for i in range(len(age)): # 0 1  2
    #print(names[i],age[i])
    print(f"the {names[i]} age is:{age[i]}")
```

```
the Ramesh age is:20
the Suresh age is:22
the Mahesh age is:24
```

zip

In [12]:
```
names=['Ramesh','Suresh','Mahesh']
age=[20,22,24]
# these two lists are together
# Ramesh is related with 20
# we can combined both in the form of zip
list(zip(names,age))
```

Out[12]:
```
[('Ramesh', 20), ('Suresh', 22), ('Mahesh', 24)]
```

In [14]:
```
for i in zip(names,age):
    print(i)
```

```
('Ramesh', 20)
('Suresh', 22)
('Mahesh', 24)
```

In [16]:
```
a,b=(20,30)
a
```

Out[16]:
```
(20, 30)
```

In [22]:
```
for i,j in zip(names,age):
    print(f"{i} age is:{j}")
```

```
Ramesh age is:20
Suresh age is:22
Mahesh age is:24
```

pair concept

- dictionary is concept related pair the items
- it is represent with curly braces : {}
- two items : key and value
- dictionary is called as {key:value} pair

In [27]:
```
dict(zip(names,age))
```

Out[27]:
```
{'Ramesh': 20, 'Suresh': 22, 'Mahesh': 24}
```

In [29]:
```
d={'Ramesh': 20, 'Suresh': 22, 'Mahesh': 24}
d
```

Out[29]:
```
{'Ramesh': 20, 'Suresh': 22, 'Mahesh': 24}
```

In [ ]:
```
# in above keys are : 'Ramesh','Suresh','Mahesh'
#         values are : 20,22,24
```

intializations

In [ ]:
```
dict1={'Ramesh':20,'Suresh':22,'Mahesh':24}
dict2={20:'Ramesh',22:'Suresh',24:'Mahesh'}
dict3={'20':'Ramesh','22':'Suresh','24':'Mahesh'}
dict4={20:20,22:22,24:24}
dict5={'Ramesh':20,'Ramesh':22}
dict6={'Ramesh':20,'Ramesh':20}
dict7={'Ramesh':20,'Suresh':20}
dict8={'Ramesh':20,
       20:'Suresh',
       'Sathish':True,
       False:True}
dict9={'Names':['Ramesh','Suresh','Mahesh']}
dict10={['Ramesh','Suresh','Mahesh']:'Names'}
dict11={'Names':('Ramesh','Suresh','Mahesh')}
dict12={('Ramesh','Suresh','Mahesh'):'Names'}
dict13={}
dict14={{'Ramesh':20}:21}
dict14
```

In [32]:
```
dict1={'Ramesh':20,'Suresh':22,'Mahesh':24}
dict1
```

Out[32]:
```
{'Ramesh': 20, 'Suresh': 22, 'Mahesh': 24}
```

In [34]:
```
len(dict1)
```

Out[34]:
```
3
```

In [42]:
```
max(dict1), ord('R'),ord('S'),ord('M')
```

Out[42]:
```
('Suresh', 82, 83, 77)
```

KEYS ARE IMPORTANT

In [47]:
```
min(dict1)
```

Out[47]:
```
'Mahesh'
```

In [49]:
```
sum(dict1)
```

```
---------------------------------------------------------------------------
TypeError                                 Traceback (most recent call last)
Cell In[49], line 1
----> 1 sum(dict1)

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

In [ ]:
```
sum(['R','M','S']) # fail
```

In [57]:
```
sorted(dict1,reverse=True)
```

Out[57]:
```
['Suresh', 'Ramesh', 'Mahesh']
```

In [55]:
```
list(reversed(dict1))
```

Out[55]:
```
['Mahesh', 'Suresh', 'Ramesh']
```

In [ ]:
```
dict2={20:'Ramesh',22:'Suresh',24:'Mahesh'}
min(dict2) # 20 [20,22,24]
max(dict2) # max
sum(dict2) # 66
sorted(dict2) # 20,22,24
reversed(dict2) # 24,22,20
```

In [59]:
```
dict3={'20':'Ramesh','22':'Suresh','24':'Mahesh'}
dict3
```

Out[59]:
```
{'20': 'Ramesh', '22': 'Suresh', '24': 'Mahesh'}
```

In [61]:
```
dict4={20:20,22:22,24:24}
dict4
```

Out[61]:
```
{20: 20, 22: 22, 24: 24}
```

In [63]:
```
dict5={'Ramesh':20,'Ramesh':22}
dict5
```

Out[63]:
```
{'Ramesh': 22}
```

In [65]:
```
dict6={'Ramesh':20,'Ramesh':20}
dict6
```

Out[65]:
```
{'Ramesh': 20}
```

In [67]:
```
dict7={'Ramesh':20,'Suresh':20}
dict7
```

Out[67]:
```
{'Ramesh': 20, 'Suresh': 20}
```

In [ ]:
```
dict5={'Ramesh':20,'Ramesh':22}  # latest value
dict6={'Ramesh':20,'Ramesh':20}  # one value
dict7={'Ramesh':20,'Suresh':20}  # two entries
```

In [69]:
```
dict8={'Ramesh':20,
       20:'Suresh',
       'Sathish':True,
       False:True}

dict8
```

Out[69]:
```
{'Ramesh': 20, 20: 'Suresh', 'Sathish': True, False: True}
```

In [71]:
```
dict9={'Names':['Ramesh','Suresh','Mahesh']}
dict9
```

Out[71]:
```
{'Names': ['Ramesh', 'Suresh', 'Mahesh']}
```

In [73]:
```
dict10={'Names':('Ramesh','Suresh','Mahesh')}
dict10
```

Out[73]:
```
{'Names': ('Ramesh', 'Suresh', 'Mahesh')}
```

In [75]:
```
dict11={['Ramesh','Suresh','Mahesh']:'Names'}
dict11

# List are mutable
```

```
---------------------------------------------------------------------------
TypeError                                 Traceback (most recent call last)
Cell In[75], line 1
----> 1 dict11={['Ramesh','Suresh','Mahesh']:'Names'}
      2 dict11

TypeError: unhashable type: 'list'
```

In [77]:
```
dict12={('Ramesh','Suresh','Mahesh'):'Names'}
dict12
# tuple are immutable
```

Out[77]:
```
{('Ramesh', 'Suresh', 'Mahesh'): 'Names'}
```

In [79]:
```
dict14={{'Ramesh':20}:21}
dict14
```

```
---------------------------------------------------------------------------
TypeError                                 Traceback (most recent call last)
Cell In[79], line 1
----> 1 dict14={{'Ramesh':20}:21}
      2 dict14

TypeError: unhashable type: 'dict'
```

In [ ]:
```
{<list>:<values>}  # fail  mutable
{<tuple>:<values>] # works immutable
{<dict>:<values>}  # fail  mutable
```

concatenation

In [82]:
```
dict1={'Ramesh':20,'Suresh':22,'Mahesh':24}
dict2={20:'Ramesh',22:'Suresh',24:'Mahesh'}
dict1+dict2
```

```
---------------------------------------------------------------------------
TypeError                                 Traceback (most recent call last)
Cell In[82], line 3
      1 dict1={'Ramesh':20,'Suresh':22,'Mahesh':24}
      2 dict2={20:'Ramesh',22:'Suresh',24:'Mahesh'}
----> 3 dict1+dict2

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

In [84]:
```
'Ramesh' in ['Ramesh','Suresh','Mahesh']
```

Out[84]: True

In [92]:
```
dict1={'Ramesh':20,'Suresh':22,'Mahesh':24}
'Ramesh' in dict1
'Suresh' in dict1
'Mahesh' in dict1

# i  in dict1
```

Out[92]: True

In [90]:
```
20 in dict1
```

Out[90]: False

In [94]:
```
for i in dict1:
    print(i)
```

```
Ramesh
Suresh
Mahesh
```

index

In [97]:
```
dict1={'Ramesh':20,'Suresh':22,'Mahesh':24}
dict1[0]

# 'Ramesh'  20
# 'Ramesh' : 20
```

```
---------------------------------------------------------------------------
KeyError                                  Traceback (most recent call last)
Cell In[97], line 2
      1 dict1={'Ramesh':20,'Suresh':22,'Mahesh':24}
----> 2 dict1[0]

KeyError: 0
```

In [99]:
```
dict1={'Ramesh':20,'Suresh':22,'Mahesh':24}
dict1['Ramesh']
# dict1[<key>]  then value will come
```

Out[99]: 20

In [ ]:
```
dict1={'Ramesh':20,'Suresh':22,'Mahesh':24}
dict1['Ramesh']# 20
dict1['Suresh'] # 22
dict1['Mahesh'] # 24

# dict1[i]
```

In [105…
```
for i in dict1:
    print(i)
    print(dict1[i])
    print(f"{i} age is {dict1[i]}")
```

```
Ramesh
20
Ramesh age is 20
Suresh
22
Suresh age is 22
Mahesh
24
Mahesh age is 24
```

empty dictionary

In [108…
```
s=''
s=s+'a'
s
```

Out[108…
```
'a'
```

In [110…
```
l=[]
l.append(20)
l
```

Out[110…
```
[20]
```

In [114…
```
d={}
d['ramesh']=20
d['suresh']=22
d
```

Out[114…
```
{'ramesh': 20, 'suresh': 22}
```

In [122…
```
names=['Ramesh', 'Suresh', 'Mahesh']
age=[20, 22, 24]
d={}
for i,j in zip(names,age):
    d[i]=j

d
```

Out[122…
```
{'Ramesh': 20, 'Suresh': 22, 'Mahesh': 24}
```

In [124…
```
s='hai how are you'
s.split()
```

Out[124…
```
['hai', 'how', 'are', 'you']
```

In [126…
```
dict1
```

Out[126…
```
{'Ramesh': 20, 'Suresh': 22, 'Mahesh': 24}
```

In [130…
```
names=[]
age=[]
for key in dict1:
    names.append(key)
    age.append(dict1[key])
names
```

Out[130… ['Ramesh', 'Suresh', 'Mahesh']

In [ ]: