In [1]:
```
import pandas as pd
a = pd.Series([2,3,5,7,9])
```

In [2]:
```
a
```

Out[2]:
```
0    2
1    3
2    5
3    7
4    9
dtype: int64
```

In [32]:
```
x=[['mahendra',20,4000],['mahi',30,5000],['amf',38,20000],['ma',50,300
pd.DataFrame(x, columns=['name','age','mgrid'])
```

Out[32]:

	name	age	mgrid
0	mahendra	20	4000
1	mahi	30	5000
2	amf	38	20000
3	ma	50	30000

In [3]:
```
import pandas as pd
data = {'id': [1,2,3,4,5,6], 'name': ['mahendra', 'mahi', 'sai', 'dash
        'manager':[3,4,1,1,3,6], 'salary':[10000,3000,40000,5000,50000
       ,'age': [20,30,49,32,28,35]}
```

In [4]:
```
df=pd.DataFrame(data)
```

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

Out[5]:

	id	name	manager	salary	age
0	1	mahendra	3	10000	20
1	2	mahi	4	3000	30
2	3	sai	1	40000	49
3	4	dash	1	5000	32
4	5	maha	3	50000	28
5	6	obul	6	20000	35

In [6]:
```
1 df.info()
```

```
<class 'pandas.core.frame.DataFrame'>
RangeIndex: 6 entries, 0 to 5
Data columns (total 5 columns):
 #   Column   Non-Null Count  Dtype
---  ------   --------------  -----
 0   id       6 non-null      int64
 1   name     6 non-null      object
 2   manager  6 non-null      int64
 3   salary   6 non-null      int64
 4   age      6 non-null      int64
dtypes: int64(4), object(1)
memory usage: 368.0+ bytes
```

In [7]:
```
1 df.head()
```

Out[7]:

	id	name	manager	salary	age
0	1	mahendra	3	10000	20
1	2	mahi	4	3000	30
2	3	sai	1	40000	49
3	4	dash	1	5000	32
4	5	maha	3	50000	28

In [8]:
```
1 df.tail()
```

Out[8]:

	id	name	manager	salary	age
1	2	mahi	4	3000	30
2	3	sai	1	40000	49
3	4	dash	1	5000	32
4	5	maha	3	50000	28
5	6	obul	6	20000	35

In [9]:
```
1 df.describe()
```

Out[9]:

	id	manager	salary	age
count	6.000000	6.000000	6.000000	6.000000
mean	3.500000	3.000000	21333.333333	32.333333
std	1.870829	1.897367	19510.680836	9.605554
min	1.000000	1.000000	3000.000000	20.000000
25%	2.250000	1.500000	6250.000000	28.500000
50%	3.500000	3.000000	15000.000000	31.000000
75%	4.750000	3.750000	35000.000000	34.250000
max	6.000000	6.000000	50000.000000	49.000000

In [10]:
```
1 df[['id', 'name', 'salary']]
```

Out[10]:

	id	name	salary
0	1	mahendra	10000
1	2	mahi	3000
2	3	sai	40000
3	4	dash	5000
4	5	maha	50000
5	6	obul	20000

In [11]:
```
1 df.iloc[0:4]
```

Out[11]:

	id	name	manager	salary	age
0	1	mahendra	3	10000	20
1	2	mahi	4	3000	30
2	3	sai	1	40000	49
3	4	dash	1	5000	32

In [12]:
```
1 print(df.iloc[:1])
```

```
   id      name  manager  salary  age
0   1  mahendra        3   10000   20
```

In [13]:
```
1 df.iloc[2:]
```

Out[13]:

	id	name	manager	salary	age
2	3	sai	1	40000	49
3	4	dash	1	5000	32
4	5	maha	3	50000	28
5	6	obul	6	20000	35

In [14]:
```
1 a=df['salary']>10000
2 a
```

Out[14]:
```
0    False
1    False
2     True
3    False
4     True
5     True
Name: salary, dtype: bool
```

In [15]:
```
df[a]
```

Out[15]:

	id	name	manager	salary	age
2	3	sai	1	40000	49
4	5	maha	3	50000	28
5	6	obul	6	20000	35

In [16]:
```
df[(df['salary']>10000) | (df['age']>30)]
```

Out[16]:

	id	name	manager	salary	age
2	3	sai	1	40000	49
3	4	dash	1	5000	32
4	5	maha	3	50000	28
5	6	obul	6	20000	35

In [17]:
```
df[(df['salary']>10000) & (df['age']>30)]
```

Out[17]:

	id	name	manager	salary	age
2	3	sai	1	40000	49
5	6	obul	6	20000	35

In [18]:
```
df['age']=df['age']-1
```

In [19]:
```
df
```

Out[19]:

	id	name	manager	salary	age
0	1	mahendra	3	10000	19
1	2	mahi	4	3000	29
2	3	sai	1	40000	48
3	4	dash	1	5000	31
4	5	maha	3	50000	27
5	6	obul	6	20000	34

In [20]:
```
df['updated_salary']=df['salary']*1.1
```

In [21]:
```
1 df
```

Out[21]:

	id	name	manager	salary	age	updated_salary
0	1	mahendra	3	10000	19	11000.0
1	2	mahi	4	3000	29	3300.0
2	3	sai	1	40000	48	44000.0
3	4	dash	1	5000	31	5500.0
4	5	maha	3	50000	27	55000.0
5	6	obul	6	20000	34	22000.0

In [22]:
```
1 df.drop('updated_salary', axis=1)
```

Out[22]:

	id	name	manager	salary	age
0	1	mahendra	3	10000	19
1	2	mahi	4	3000	29
2	3	sai	1	40000	48
3	4	dash	1	5000	31
4	5	maha	3	50000	27
5	6	obul	6	20000	34

In [23]:
```
1 df.isnull().sum()
```

Out[23]:
```
id              0
name            0
manager         0
salary          0
age             0
updated_salary  0
dtype: int64
```

In [24]:
```
1 df.drop('updated_salary', axis=1, inplace=True)
```

In [25]:
```
1 df.append({'id':7,'name':'singh','manager':5,'salary':34000,'age':40},
```

```
C:\Users\mahen\AppData\Local\Temp\ipykernel_14320\651030945.py:1: FutureW
arning: The frame.append method is deprecated and will be removed from pa
ndas in a future version. Use pandas.concat instead.
  df.append({'id':7,'name':'singh','manager':5,'salary':34000,'age':40},
ignore_index=True)
```

Out[25]:

	id	name	manager	salary	age
0	1	mahendra	3	10000	19
1	2	mahi	4	3000	29
2	3	sai	1	40000	48
3	4	dash	1	5000	31
4	5	maha	3	50000	27
5	6	obul	6	20000	34
6	7	singh	5	34000	40

In [26]:
```
1 df['age']=df['age'].apply(lambda x:x+1)
```

In [27]:
```
1 df
```

Out[27]:

	id	name	manager	salary	age
0	1	mahendra	3	10000	20
1	2	mahi	4	3000	30
2	3	sai	1	40000	49
3	4	dash	1	5000	32
4	5	maha	3	50000	28
5	6	obul	6	20000	35

In [ ]:
```
1
```

In [28]:
```
1 df
```

Out[28]:

	id	name	manager	salary	age
0	1	mahendra	3	10000	20
1	2	mahi	4	3000	30
2	3	sai	1	40000	49
3	4	dash	1	5000	32
4	5	maha	3	50000	28
5	6	obul	6	20000	35

In [29]:
```
df2=df.merge(df, left_on='manager', right_on='id', how ='left', suffix
df2=df2[['id', 'name', 'manager', 'salary', 'age', 'namemgr', 'salarym
df2.sort_values(by='id', ascending=True)
```

Out[29]:

	id	name	manager	salary	age	namemgr	salarymgr
0	1	mahendra	3	10000	20	sai	40000
1	2	mahi	4	3000	30	dash	5000
2	3	sai	1	40000	49	mahendra	10000
3	4	dash	1	5000	32	mahendra	10000
4	5	maha	3	50000	28	sai	40000
5	6	obul	6	20000	35	obul	20000

In [30]:
```
df2[df2['salary']<= df2['salarymgr']]
```

Out[30]:

	id	name	manager	salary	age	namemgr	salarymgr
0	1	mahendra	3	10000	20	sai	40000
1	2	mahi	4	3000	30	dash	5000
3	4	dash	1	5000	32	mahendra	10000
5	6	obul	6	20000	35	obul	20000

In [31]:
```

```

Out[31]:

	name	age	mgrid
0	mahendra	20	4000
1	mahi	30	5000
2	amf	38	20000
3	ma	50	30000

In [33]:
```
df
```

Out[33]:

	id	name	manager	salary	age
0	1	mahendra	3	10000	20
1	2	mahi	4	3000	30
2	3	sai	1	40000	49
3	4	dash	1	5000	32
4	5	maha	3	50000	28
5	6	obul	6	20000	35

In [37]:
```
e=df.groupby('age')['salary'].sum()
```

In [38]:
```
e
```

Out[38]:
```
age
20    10000
28    50000
30     3000
32     5000
35    20000
49    40000
Name: salary, dtype: int64
```

In [39]:
```
def get_department(x):
    if x['age'] > 40:
        return 'Management'
    elif x['age'] > 30:
        return 'Sales'
    else:
        return 'Support'

df['department'] = df.apply(get_department, axis=1)

```

In [40]:
```
df
```

Out[40]:

	id	name	manager	salary	age	department
0	1	mahendra	3	10000	20	Support
1	2	mahi	4	3000	30	Support
2	3	sai	1	40000	49	Management
3	4	dash	1	5000	32	Sales
4	5	maha	3	50000	28	Support
5	6	obul	6	20000	35	Sales

In [49]:
```
gdf=df.groupby('department')['salary'].sum().reset_index(name='total_s
```

In [50]:
```
gdf
```

Out[50]:

	department	total_salary_department_wise
0	Management	40000
1	Sales	25000
2	Support	63000

In [54]:
```
print(df.groupby('department')['salary'].count().reset_index(name='num
```

```
   department  number_of_employees_dept_wise
0  Management                              1
1       Sales                              2
2     Support                              3
```

In [56]:
```
1 df.groupby('department')['salary'].mean().reset_index(name='avg_salary
```

Out[56]:

	department	avg_salary_dept_wise
0	Management	40000.0
1	Sales	12500.0
2	Support	21000.0

In [60]:
```
1 import numpy as np
```

In [62]:
```
1 df
```

Out[62]:

	id	name	manager	salary	age	department
0	1	mahendra	3	10000	20	Support
1	2	mahi	4	3000	30	Support
2	3	sai	1	40000	49	Management
3	4	dash	1	5000	32	Sales
4	5	maha	3	50000	28	Support
5	6	obul	6	20000	35	Sales

In [66]:
```
1 df.append({'id':8,'name':'sam','manager':2,'salary':34000,'age':np.nan
```

```
C:\Users\mahen\AppData\Local\Temp\ipykernel_14320\64528762.py:1: FutureWa
rning: The frame.append method is deprecated and will be removed from pan
das in a future version. Use pandas.concat instead.
  df.append({'id':8,'name':'sam','manager':2,'salary':34000,'age':np.na
n}, ignore_index=True)
```

Out[66]:

	id	name	manager	salary	age	department
0	1	mahendra	3.0	10000	20.0	Support
1	2	mahi	4.0	3000	30.0	Support
2	3	sai	1.0	40000	49.0	Management
3	4	dash	1.0	5000	32.0	Sales
4	5	maha	3.0	50000	28.0	Support
5	6	obul	6.0	20000	35.0	Sales
6	7	singh	NaN	34000	40.0	NaN
7	8	sam	2.0	34000	NaN	NaN

In [75]:
```
1 df.drop([6], inplace=True)
```

In [76]:
```
1 df
```

Out[76]:

	id	name	manager	salary	age	department
0	1	mahendra	3.0	10000	20	Support
1	2	mahi	4.0	3000	30	Support
2	3	sai	1.0	40000	49	Management
3	4	dash	1.0	5000	32	Sales
4	5	maha	3.0	50000	28	Support
5	6	obul	6.0	20000	35	Sales

In [79]:
```
1 aa=df.append({'id':8,'name':'sam','manager':2,'salary':34000,'age':np.
```

```
C:\Users\mahen\AppData\Local\Temp\ipykernel_14320\3518368729.py:1: Future
Warning: The frame.append method is deprecated and will be removed from p
andas in a future version. Use pandas.concat instead.
  aa=df.append({'id':8,'name':'sam','manager':2,'salary':34000,'age':np.n
an}, ignore_index=True)
```

In [80]:
```
1 aa
```

Out[80]:

	id	name	manager	salary	age	department
0	1	mahendra	3.0	10000	20.0	Support
1	2	mahi	4.0	3000	30.0	Support
2	3	sai	1.0	40000	49.0	Management
3	4	dash	1.0	5000	32.0	Sales
4	5	maha	3.0	50000	28.0	Support
5	6	obul	6.0	20000	35.0	Sales
6	8	sam	2.0	34000	NaN	NaN

In [81]:
```
1 aa.dropna()
```

Out[81]:

	id	name	manager	salary	age	department
0	1	mahendra	3.0	10000	20.0	Support
1	2	mahi	4.0	3000	30.0	Support
2	3	sai	1.0	40000	49.0	Management
3	4	dash	1.0	5000	32.0	Sales
4	5	maha	3.0	50000	28.0	Support
5	6	obul	6.0	20000	35.0	Sales

In [83]:
```
1 aa.fillna(18)
```

Out[83]:

	id	name	manager	salary	age	department
0	1	mahendra	3.0	10000	20.0	Support
1	2	mahi	4.0	3000	30.0	Support
2	3	sai	1.0	40000	49.0	Management
3	4	dash	1.0	5000	32.0	Sales
4	5	maha	3.0	50000	28.0	Support
5	6	obul	6.0	20000	35.0	Sales
6	8	sam	2.0	34000	18.0	18

In [84]:
```
1 aa
```

Out[84]:

	id	name	manager	salary	age	department
0	1	mahendra	3.0	10000	20.0	Support
1	2	mahi	4.0	3000	30.0	Support
2	3	sai	1.0	40000	49.0	Management
3	4	dash	1.0	5000	32.0	Sales
4	5	maha	3.0	50000	28.0	Support
5	6	obul	6.0	20000	35.0	Sales
6	8	sam	2.0	34000	NaN	NaN

In [86]:
```
1 aa.fillna({'age':18, 'department': 'Sales'}, inplace=True)
```

In [87]:
```
1 aa
```

Out[87]:

	id	name	manager	salary	age	department
0	1	mahendra	3.0	10000	20.0	Support
1	2	mahi	4.0	3000	30.0	Support
2	3	sai	1.0	40000	49.0	Management
3	4	dash	1.0	5000	32.0	Sales
4	5	maha	3.0	50000	28.0	Support
5	6	obul	6.0	20000	35.0	Sales
6	8	sam	2.0	34000	18.0	Sales

In [93]:
```
1 bb=df.append({'id':8,'name':'sam','manager':2,'salary':34000,'age':18,
```

```
C:\Users\mahen\AppData\Local\Temp\ipykernel_14320\2819184862.py:1: FutureWarning: The frame.append method is deprecated and will be removed from pandas in a future version. Use pandas.concat instead.
  bb=df.append({'id':8,'name':'sam','manager':2,'salary':34000,'age':18,
'department':'support'}, ignore_index=True)
```

In [94]:
```
1 bb
```

Out[94]:

	id	name	manager	salary	age	department
0	1	mahendra	3.0	10000	20	Support
1	2	mahi	4.0	3000	30	Support
2	3	sai	1.0	40000	49	Management
3	4	dash	1.0	5000	32	Sales
4	5	maha	3.0	50000	28	Support
5	6	obul	6.0	20000	35	Sales
6	8	sam	2.0	34000	18	support

In [101]:
```
1 db=bb.copy()
```

In [102]:
```
1 db
```

Out[102]:

	id	name	manager	salary	age	department
0	1	mahendra	3.0	10000	20	Support
1	2	mahi	4.0	3000	30	Support
2	3	sai	1.0	40000	49	Management
3	4	dash	1.0	5000	32	Sales
4	5	maha	3.0	50000	28	Support
5	6	obul	6.0	20000	35	Sales
6	8	sam	2.0	34000	18	support

In [108]:
```
1 cb=pd.concat([db, bb], ignore_index=True)
```

In [109]:
```
1 cb
```

Out[109]:

	id	name	manager	salary	age	department
0	1	mahendra	3.0	10000	20	Support
1	2	mahi	4.0	3000	30	Support
2	3	sai	1.0	40000	49	Management
3	4	dash	1.0	5000	32	Sales
4	5	maha	3.0	50000	28	Support
5	6	obul	6.0	20000	35	Sales
6	8	sam	2.0	34000	18	support
7	1	mahendra	3.0	10000	20	Support
8	2	mahi	4.0	3000	30	Support
9	3	sai	1.0	40000	49	Management
10	4	dash	1.0	5000	32	Sales
11	5	maha	3.0	50000	28	Support
12	6	obul	6.0	20000	35	Sales
13	8	sam	2.0	34000	18	support

In [110]:
```
1 cb.drop_duplicates(inplace=True)
```

In [111]:
```
1 cb
```

Out[111]:

	id	name	manager	salary	age	department
0	1	mahendra	3.0	10000	20	Support
1	2	mahi	4.0	3000	30	Support
2	3	sai	1.0	40000	49	Management
3	4	dash	1.0	5000	32	Sales
4	5	maha	3.0	50000	28	Support
5	6	obul	6.0	20000	35	Sales
6	8	sam	2.0	34000	18	support

In [112]:
```
1 cb
```

Out[112]:

	id	name	manager	salary	age	department
0	1	mahendra	3.0	10000	20	Support
1	2	mahi	4.0	3000	30	Support
2	3	sai	1.0	40000	49	Management
3	4	dash	1.0	5000	32	Sales
4	5	maha	3.0	50000	28	Support
5	6	obul	6.0	20000	35	Sales
6	8	sam	2.0	34000	18	support

In [113]:
```
1 db
```

Out[113]:

	id	name	manager	salary	age	department
0	1	mahendra	3.0	10000	20	Support
1	2	mahi	4.0	3000	30	Support
2	3	sai	1.0	40000	49	Management
3	4	dash	1.0	5000	32	Sales
4	5	maha	3.0	50000	28	Support
5	6	obul	6.0	20000	35	Sales
6	8	sam	2.0	34000	18	support

In [114]:
```
1 eb=pd.merge(db,cb, on='name', how='inner')
```

In [115]:
```
1 eb
```

Out[115]:

	id_x	name	manager_x	salary_x	age_x	department_x	id_y	manager_y	salary_y	a
0	1	mahendra	3.0	10000	20	Support	1	3.0	10000	
1	2	mahi	4.0	3000	30	Support	2	4.0	3000	
2	3	sai	1.0	40000	49	Management	3	1.0	40000	
3	4	dash	1.0	5000	32	Sales	4	1.0	5000	
4	5	maha	3.0	50000	28	Support	5	3.0	50000	
5	6	obul	6.0	20000	35	Sales	6	6.0	20000	
6	8	sam	2.0	34000	18	support	8	2.0	34000	

In [134]:
```
1 fb=cb.merge(db, on='name', how='left', suffixes=['','2'])
```

In [135]:
```
1 fb
```

Out[135]:

	id	name	manager	salary	age	department	id2	manager2	salary2	age2	departm
0	1	mahendra	3.0	10000	20	Support	1	3.0	10000	20	Su
1	2	mahi	4.0	3000	30	Support	2	4.0	3000	30	Su
2	3	sai	1.0	40000	49	Management	3	1.0	40000	49	Manage
3	4	dash	1.0	5000	32	Sales	4	1.0	5000	32	S
4	5	maha	3.0	50000	28	Support	5	3.0	50000	28	Su
5	6	obul	6.0	20000	35	Sales	6	6.0	20000	35	S
6	8	sam	2.0	34000	18	support	8	2.0	34000	18	su

In [ ]:
```
1
```