In [2]:
```
import numpy as np
import pandas as pd
df=pd.DataFrame(np.random.randn(5,3),index=['a','c','e','f','h'],columns=['
print(df)
```

```
        one       two     three
a  0.245966 -0.037729  0.716599
c -0.458687  0.034530  1.169503
e  0.222792  1.142089  0.670718
f -0.412046  0.384853  2.196847
h  0.044213 -0.482927 -0.938850
```

In [31]:
```
a=df.reindex(['a','b','c','d','e','f','g','h'])
print(a)
```

```
        one       two     three
a  0.245966 -0.037729  0.716599
b       NaN       NaN       NaN
c -0.458687  0.034530  1.169503
d       NaN       NaN       NaN
e  0.222792  1.142089  0.670718
f -0.412046  0.384853  2.196847
g       NaN       NaN       NaN
h  0.044213 -0.482927 -0.938850
```

In [6]:
```
b=df
print(b)
```

```
        one       two     three
a  0.245966 -0.037729  0.716599
b       NaN       NaN       NaN
c -0.458687  0.034530  1.169503
d       NaN       NaN       NaN
e  0.222792  1.142089  0.670718
f -0.412046  0.384853  2.196847
g       NaN       NaN       NaN
h  0.044213 -0.482927 -0.938850
```

In [10]:
```
print(df.dropna())
```

```
        one       two     three
a  0.245966 -0.037729  0.716599
c -0.458687  0.034530  1.169503
e  0.222792  1.142089  0.670718
f -0.412046  0.384853  2.196847
h  0.044213 -0.482927 -0.938850
```

In [12]:
```
df2=b
print(df2)
```

```
        one       two     three
a  0.245966 -0.037729  0.716599
b       NaN       NaN       NaN
c -0.458687  0.034530  1.169503
d       NaN       NaN       NaN
e  0.222792  1.142089  0.670718
f -0.412046  0.384853  2.196847
g       NaN       NaN       NaN
h  0.044213 -0.482927 -0.938850
```

In [13]:
```
print(df2.fillna(method='pad'))
```

```
        one       two     three
a  0.245966 -0.037729  0.716599
b  0.245966 -0.037729  0.716599
c -0.458687  0.034530  1.169503
d -0.458687  0.034530  1.169503
e  0.222792  1.142089  0.670718
f -0.412046  0.384853  2.196847
g -0.412046  0.384853  2.196847
h  0.044213 -0.482927 -0.938850
```

In [15]:
```
df4=df2
print(df4.fillna(method='bfill'))
```

```
        one       two     three
a  0.245966 -0.037729  0.716599
b -0.458687  0.034530  1.169503
c -0.458687  0.034530  1.169503
d  0.222792  1.142089  0.670718
e  0.222792  1.142089  0.670718
f -0.412046  0.384853  2.196847
g  0.044213 -0.482927 -0.938850
h  0.044213 -0.482927 -0.938850
```

In [18]:
```
print(df['one'].isnull())
```

```
a    False
b     True
c    False
d     True
e    False
f    False
g     True
h    False
Name: one, dtype: bool
```

In [19]:
```
print(df['one'].notnull())
```

```
a     True
b    False
c     True
d    False
e     True
f     True
g    False
h     True
Name: one, dtype: bool
```

In [15]:
```
a1=pd.DataFrame([["Ram",28],["Mark",25],["Mary",36],["Tom",21]],columns=['Na
print(a1)
```

```
   Name  Age
0   Ram   28
1  Mark   25
2  Mary   36
3   Tom   21
```

In [5]:
```
import numpy as np
import pandas as pd
df=pd.DataFrame([['tiger',220],['lion',200],['tiger',210],['cheetah',250],[
print(df)
```

```
    animal  speed
0    tiger    220
1     lion    200
2    tiger    210
3  cheetah    250
4     lion    190
5    tiger    150
6  cheetah    230
```

In [6]:
```
M=df.groupby(['animal']).mean()
print(M)
```

```
              speed
animal
cheetah  240.000000
lion     195.000000
tiger    193.333333
```

In [7]:
```
S=df.groupby(['animal']).sum()
print(S)
```

```
         speed
animal
cheetah    480
lion       390
tiger      580
```

In [10]:
```
C=df.groupby(['animal']).count()
print(C)
```

```
         speed
animal
cheetah      2
lion         2
tiger        3
```

In [11]:
```
F=df.groupby(['animal']).first()
print(F)
```

```
         speed
animal
cheetah    250
lion       200
tiger      220
```

In [12]:
```
L=df.groupby(['animal']).last()
print(L)
```

```
         speed
animal
cheetah    230
lion       190
tiger      150
```

In [13]:
```
Z=df.groupby(['animal']).size()
print(Z)
```

```
animal
cheetah    2
lion       2
tiger      3
dtype: int64
```

In [ ]: