PANDAS PART 2

In [1]:
```
import pandas as pd
import numpy as np
```

In [2]:
```
df=pd.DataFrame({
    "A":5.6,
    "B":pd.date_range("2004-07-18",periods=5),
    "C":pd.Series([1,2,8,4,5],index=list("12345")),
    "D":pd.Categorical(["test","train","train","testing","training"])

},index=list("12345"),columns=list("ABCD"))
df
```

Out[2]:

	A	B	C	D
1	5.6	2004-07-18	1	test
2	5.6	2004-07-19	2	train
3	5.6	2004-07-20	8	train
4	5.6	2004-07-21	4	testing
5	5.6	2004-07-22	5	training

Boolean indexing

```
column=> axis=1,column=list("")
row=> axis=0,index=
axis{0 or ‘index’, 1 or ‘columns’}, default 0
```

In [3]:
```
print(df["C"]>4)
print(df[df["C"]>4])
```

```
1    False
2    False
3     True
4    False
5     True
Name: C, dtype: bool
     A          B  C         D
3  5.6 2004-07-20  8     train
5  5.6 2004-07-22  5  training
```

In [4]:
```
#.copy()
df1=df.copy()
df1["E"]=["one", "two", "three", "four","five"]
#new column is created
print(df1)
```

```
     A           B  C         D      E
1  5.6 2004-07-18  1      test    one
2  5.6 2004-07-19  2     train    two
3  5.6 2004-07-20  8     train  three
4  5.6 2004-07-21  4   testing   four
5  5.6 2004-07-22  5  training   five
```

In [5]:
```
#isin()
df1[df1["E"].isin(["one"])]
```

Out[5]:

	A	B	C	D	E
1	5.6	2004-07-18	1	test	one

Setting

```
new column automatically aligns the data by the index
```

In [6]:
```
s1 = pd.Series([1, 24, 32, 46,75], index=list("12345"))

df["E"]=s1
df
```

Out[6]:

	A	B	C	D	E
1	5.6	2004-07-18	1	test	1
2	5.6	2004-07-19	2	train	24
3	5.6	2004-07-20	8	train	32
4	5.6	2004-07-21	4	testing	46
5	5.6	2004-07-22	5	training	75

In [7]:

```
# Setting values by label
df.at[1,"A"]=5.5
df.at[10,"A"]=5
df.at[2,"A"]=5.8
df
```

Out[7]:

	A	B	C	D	E
1	5.6	2004-07-18	1.0	test	1.0
2	5.6	2004-07-19	2.0	train	24.0
3	5.6	2004-07-20	8.0	train	32.0
4	5.6	2004-07-21	4.0	testing	46.0
5	5.6	2004-07-22	5.0	training	75.0
1	5.5	NaT	NaN	NaN	NaN
10	5.0	NaT	NaN	NaN	NaN
2	5.8	NaT	NaN	NaN	NaN

In [8]:

```
# Setting values by position
df.iat[3,1]=8.4
df.iat[3,4]=8.4
df
```

Out[8]:

	A	B	C	D	E
1	5.6	2004-07-18 00:00:00	1.0	test	1.0
2	5.6	2004-07-19 00:00:00	2.0	train	24.0
3	5.6	2004-07-20 00:00:00	8.0	train	32.0
4	5.6	8.4	4.0	testing	8.4
5	5.6	2004-07-22 00:00:00	5.0	training	75.0
1	5.5	NaT	NaN	NaN	NaN
10	5.0	NaT	NaN	NaN	NaN
2	5.8	NaT	NaN	NaN	NaN

In [9]:
```
df.loc[:,"E"]=np.array([5]*len(df))
df
```

```
C:\Users\heman\AppData\Local\Temp\ipykernel_25372\2153832009.py:1: FutureWa
rning: In a future version, `df.iloc[:, i] = newvals` will attempt to set t
he values inplace instead of always setting a new array. To retain the old
behavior, use either `df[df.columns[i]] = newvals` or, if columns are non-u
nique, `df.isetitem(i, newvals)`
  df.loc[:,"E"]=np.array([5]*len(df))
```

Out[9]:

	A	B	C	D	E
1	5.6	2004-07-18 00:00:00	1.0	test	5
2	5.6	2004-07-19 00:00:00	2.0	train	5
3	5.6	2004-07-20 00:00:00	8.0	train	5
4	5.6	8.4	4.0	testing	5
5	5.6	2004-07-22 00:00:00	5.0	training	5
1	5.5	NaT	NaN	NaN	5
10	5.0	NaT	NaN	NaN	5
2	5.8	NaT	NaN	NaN	5

Missing data

In [10]:
```
#fillna() =>fill null with mean...
#dropna() =>remove null
#isna() =>check is null
```

In [11]:
```
pd.isna(df)
```

Out[11]:

	A	B	C	D	E
1	False	False	False	False	False
2	False	False	False	False	False
3	False	False	False	False	False
4	False	False	False	False	False
5	False	False	False	False	False
1	False	True	True	True	False
10	False	True	True	True	False
2	False	True	True	True	False

In [12]:
```
df.sum().isna()
```

```
C:\Users\heman\AppData\Local\Temp\ipykernel_25372\1949428304.py:1: FutureWa
rning: The default value of numeric_only in DataFrame.sum is deprecated. In
a future version, it will default to False. In addition, specifying 'numeri
c_only=None' is deprecated. Select only valid columns or specify the value
of numeric_only to silence this warning.
  df.sum().isna()
```

Out[12]:
```
A    False
C    False
E    False
dtype: bool
```

In [13]:
```
df["C"].dropna()
```

Out[13]:
```
1    1.0
2    2.0
3    8.0
4    4.0
5    5.0
Name: C, dtype: float64
```

In [14]:
```
df["C"].fillna(0)
df
```

Out[14]:

	A	B	C	D	E
1	5.6	2004-07-18 00:00:00	1.0	test	5
2	5.6	2004-07-19 00:00:00	2.0	train	5
3	5.6	2004-07-20 00:00:00	8.0	train	5
4	5.6	8.4	4.0	testing	5
5	5.6	2004-07-22 00:00:00	5.0	training	5
1	5.5	NaT	NaN	NaN	5
10	5.0	NaT	NaN	NaN	5
2	5.8	NaT	NaN	NaN	5

```
inplacebool, default False
If True, fill in-place. Note: this will modify any other views on this
object (e.g., a no-copy slice for a column in a DataFrame)
```

Operations

```
Stats
```

In [15]:
```
df["A"].mean()
```

Out[15]:
```
5.5375
```

In [16]:
```
# df.mean(axis=1)
```

In [17]:
```
df["C"].median()
```

Out[17]:
```
4.0
```

In [18]:
```
#shift =>move element in series
print(pd.Series([1, 3, 5, np.nan, 6, 8]))
print(pd.Series([1, 3, 5, np.nan, 6, 8]).shift(2))
s=pd.Series([1, 3, 5, np.nan, 6, 8]).shift(2)
```

```
0    1.0
1    3.0
2    5.0
3    NaN
4    6.0
5    8.0
dtype: float64
0    NaN
1    NaN
2    1.0
3    3.0
4    5.0
5    NaN
dtype: float64
```

In [19]:
```
# sub => subract (row or column)
```

In [20]:
```
df["E"].sub(s, axis="index")
```

Out[20]:
```
0     NaN
1     NaN
2     4.0
3     NaN
4     NaN
5     NaN
10    NaN
1     NaN
2     NaN
3     NaN
4     NaN
5     NaN
dtype: float64
```

In [21]:
```
#agg is an alias for aggregate
```

In [22]:
```
df.agg('sum',axis="columns")
```

```
C:\Users\heman\AppData\Local\Temp\ipykernel_25372\1423552456.py:1: FutureWa
rning: The default value of numeric_only in DataFrame.sum is deprecated. In
a future version, it will default to False. In addition, specifying 'numeri
c_only=None' is deprecated. Select only valid columns or specify the value
of numeric_only to silence this warning.
  df.agg('sum',axis="columns")
```

Out[22]:
```
1      10.5
10     10.0
2      10.8
dtype: object
```

In [23]:
```
df["C"].agg(['sum', 'min','max'])
```

Out[23]:
```
sum    20.0
min     1.0
max     8.0
Name: C, dtype: float64
```

In [24]:
```
df.agg({'A' : ['sum', 'min'], 'C' : ['min', 'max']})
```

Out[24]:

	A	C
sum	44.3	NaN
min	5.0	1.0
max	NaN	8.0

In [25]:
```
# Applies a function to each value (element) in a DataFrame.
# Often used for group-wise transformations, but can also be applied to the
```

In [26]:
```
df["C"].transform(lambda x: x + 1)
```

Out[26]:
```
1      2.0
2      3.0
3      9.0
4      5.0
5      6.0
1      NaN
10     NaN
2      NaN
Name: C, dtype: float64
```

In [27]:
```
s1=pd.Series(np.random.randint(0,8,size=12))
print(s1)
s1.value_counts()
# count number of occurrence
```

```
0     7
1     6
2     0
3     3
4     2
5     2
6     7
7     4
8     2
9     5
10    1
11    4
dtype: int32
```

Out[27]:
```
2    3
7    2
4    2
6    1
0    1
3    1
5    1
1    1
dtype: int64
```

In [28]:
```
df.groupby("D").sum()
df.groupby("D")[["A","C"]].sum()
```

```
C:\Users\heman\AppData\Local\Temp\ipykernel_25372\1267160968.py:1: FutureWa
rning: The default value of numeric_only in DataFrameGroupBy.sum is depreca
ted. In a future version, numeric_only will default to False. Either specif
y numeric_only or select only columns which should be valid for the functio
n.
  df.groupby("D").sum()
```

Out[28]:

	A	C
D		
test	5.6	1.0
testing	5.6	4.0
train	11.2	10.0
training	5.6	5.0

pivot_table() pivots a DataFrame specifying the values, index and columns

In [29]:
```
pd.pivot_table(df,values="D",index=['C'])
```

```
C:\Users\heman\AppData\Local\Temp\ipykernel_25372\3834935483.py:1: FutureWa
rning: The default value of numeric_only in DataFrameGroupBy.mean is deprec
ated. In a future version, numeric_only will default to False. Either speci
fy numeric_only or select only columns which should be valid for the functi
on.
  pd.pivot_table(df,values="D",index=['C'])
```

Out[29]:

C
1.0
2.0
4.0
5.0
8.0

In [30]:
```
df3=pd.DataFrame({
    "id":[1,2,4,5,6,7],"raw":["A","E","W","E","A","D"]
})
df3
```

Out[30]:

	id	raw
0	1	A
1	2	E
2	4	W
3	5	E
4	6	A
5	7	D

In [31]:
```
df3["grade"]=df3["raw"].astype("category")
print(df3)
df3.dtypes
```

```
   id raw grade
0   1   A     A
1   2   E     E
2   4   W     W
3   5   E     E
4   6   A     A
5   7   D     D
```

Out[31]:
```
id          int64
raw        object
grade    category
dtype: object
```

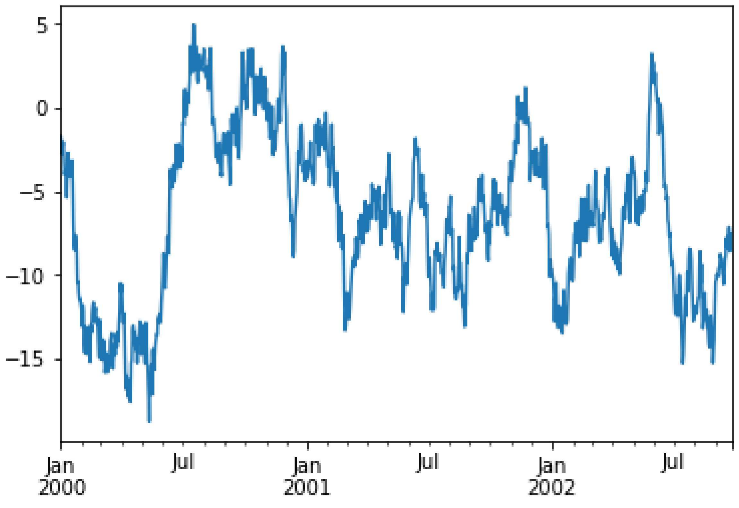
In [34]:
```
df3.groupby("grade", observed=False).size()
```

Out[34]:
```
grade
A    2
D    1
E    2
W    1
dtype: int64
```

In [35]:
```
ts = pd.Series(np.random.randn(1000), index=pd.date_range("1/1/2000", period

ts = ts.cumsum()

ts.plot();
```



In [ ]: