

exp 5 pandas

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```
In [1]: print("pandas")
```

pandas

```
In [2]: import numpy as np
```

```
In [3]: a1=np.array([1,2,3])  
a1
```

```
Out[3]: array([1, 2, 3])
```

```
In [4]: a2=np.array([[1,2,5],[1,4,5]])  
a2
```

```
Out[4]: array([[1, 2, 5],  
              [1, 4, 5]])
```

```
In [5]: a2=np.array([[1,2,0],[1,5,5]])  
a2
```

```
Out[5]: array([[1, 2, 0],  
              [1, 5, 5]])
```

```
In [6]: a=np.array([[[1,2,3],[4,5,6]],[[5,7,9],[6,3,2]],[[7,8,9],[5,4,6]]])  
a
```

```
Out[6]: array([[[1, 2, 3],  
               [4, 5, 6]],  
                
              [[5, 7, 9],  
               [6, 3, 2]],  
                
              [[7, 8, 9],  
               [5, 4, 6]]])
```

```
In [7]: a.shape
```

```
Out[7]: (3, 2, 3)
```

```
In [ ]:
```

```
In [8]: a.ndim
```

```
Out[8]: 3
```

```
In [9]: a1.ndim
```

```
Out[9]: 1
```

```
In [10]: a.dtype
```

```
Out[10]: dtype('int32')
```

```
In [11]: np.random.seed(0)
np_array=np.random.randint(100,size=(4,10))
np_array
```

```
Out[11]: array([[44, 47, 64, 67, 67,  9, 83, 21, 36, 87],
                [70, 88, 88, 12, 58, 65, 39, 87, 46, 88],
                [81, 37, 25, 77, 72,  9, 20, 80, 69, 79],
                [47, 64, 82, 99, 88, 49, 29, 19, 19, 14]])
```

```
In [12]: np_array[0:2,0:3]
```

```
Out[12]: array([[44, 47, 64],
                [70, 88, 88]])
```

```
In [13]: np_array.T
```

```
Out[13]: array([[44, 70, 81, 47],
                [47, 88, 37, 64],
                [64, 88, 25, 82],
                [67, 12, 77, 99],
                [67, 58, 72, 88],
                [ 9, 65,  9, 49],
                [83, 39, 20, 29],
                [21, 87, 80, 19],
                [36, 46, 69, 19],
                [87, 88, 79, 14]])
```

```
In [14]: import pandas as pd
import numpy as np
np_array=np.array([[1,2,3],[4,5,6]])
df=pd.DataFrame(np_array,index=['x','y'],columns=[1,2,3])
df
```

```
Out[14]:
```

	1	2	3
x	1	2	3
y	4	5	6

```
In [15]: colours=pd.Series(["Black","green","red","white"])
colours
```

```
Out[15]: 0    Black
1    green
2     red
3    white
dtype: object
```

```
In [16]: cars=pd.Series(["bmw","nsx","benz","alfa"])
cars
```

```
Out[16]: 0    bmw
1  nsxbenz
2    alfa
dtype: object
```

```
In [17]: cars_data=pd.DataFrame({"car makers":cars,"car colours":colours})
cars_data
```

Out[17]:

	car makers	car colours
0	bmw	Black
1	nsxbenz	green
2	alfa	red
3	NaN	white

In []:

```
In [18]: car_sales=pd.read_csv("car-sales.csv")
car_sales
```

Out[18]:

	Make	Colour	Odometer (KM)	Doors	Price
0	Toyota	White	150043	4	\$4,000.00
1	Honda	Red	87899	4	\$5,000.00
2	Toyota	Blue	32549	3	\$7,000.00
3	BMW	Black	11179	5	\$22,000.00
4	Nissan	White	213095	4	\$3,500.00
5	Toyota	Green	99213	4	\$4,500.00
6	Honda	Blue	45698	4	\$7,500.00
7	Honda	Blue	54738	4	\$7,000.00
8	Toyota	White	60000	4	\$6,250.00
9	Nissan	White	31600	4	\$9,700.00

```
In [19]: car_sales=pd.read_csv("car-sales.csv")
car_sales
```

Out[19]:

	Make	Colour	Odometer (KM)	Doors	Price
0	Toyota	White	150043	4	\$4,000.00
1	Honda	Red	87899	4	\$5,000.00
2	Toyota	Blue	32549	3	\$7,000.00
3	BMW	Black	11179	5	\$22,000.00
4	Nissan	White	213095	4	\$3,500.00
5	Toyota	Green	99213	4	\$4,500.00
6	Honda	Blue	45698	4	\$7,500.00
7	Honda	Blue	54738	4	\$7,000.00
8	Toyota	White	60000	4	\$6,250.00
9	Nissan	White	31600	4	\$9,700.00

```
In [20]: car_sales=pd.read_csv("car-sales.csv")
car_sales
```

Out[20]:

	Make	Colour	Odometer (KM)	Doors	Price
0	Toyota	White	150043	4	\$4,000.00
1	Honda	Red	87899	4	\$5,000.00
2	Toyota	Blue	32549	3	\$7,000.00
3	BMW	Black	11179	5	\$22,000.00
4	Nissan	White	213095	4	\$3,500.00
5	Toyota	Green	99213	4	\$4,500.00
6	Honda	Blue	45698	4	\$7,500.00
7	Honda	Blue	54738	4	\$7,000.00
8	Toyota	White	60000	4	\$6,250.00
9	Nissan	White	31600	4	\$9,700.00

```
In [21]: car_sales.dtypes
```

Out[21]: Make object
Colour object
Odometer (KM) int64
Doors int64
Price object
dtype: object

```
In [22]: car_sales.info
```

Out[22]: <bound method DataFrame.info of
ice
0 Toyota White 150043 4 \$4,000.00
1 Honda Red 87899 4 \$5,000.00
2 Toyota Blue 32549 3 \$7,000.00
3 BMW Black 11179 5 \$22,000.00
4 Nissan White 213095 4 \$3,500.00
5 Toyota Green 99213 4 \$4,500.00
6 Honda Blue 45698 4 \$7,500.00
7 Honda Blue 54738 4 \$7,000.00
8 Toyota White 60000 4 \$6,250.00
9 Nissan White 31600 4 \$9,700.00>

```
In [23]: car_sales.columns
```

Out[23]: Index(['Make', 'Colour', 'Odometer (KM)', 'Doors', 'Price'], dtype='object')

```
In [24]: len(car_sales)
```

Out[24]: 10

```
In [25]: car_sales.head()
```

Out[25]:

	Make	Colour	Odometer (KM)	Doors	Price
0	Toyota	White	150043	4	\$4,000.00
1	Honda	Red	87899	4	\$5,000.00
2	Toyota	Blue	32549	3	\$7,000.00
3	BMW	Black	11179	5	\$22,000.00
4	Nissan	White	213095	4	\$3,500.00

In [26]:

```
car_sales.tail()
```

Out[26]:

	Make	Colour	Odometer (KM)	Doors	Price
5	Toyota	Green	99213	4	\$4,500.00
6	Honda	Blue	45698	4	\$7,500.00
7	Honda	Blue	54738	4	\$7,000.00
8	Toyota	White	60000	4	\$6,250.00
9	Nissan	White	31600	4	\$9,700.00

In [27]:

```
car_sales.iloc[3]
```

Out[27]:

MakeBMW
ColourBlack
Odometer (KM)11179
Doors5
Price\$22,000.00
Name: 3, dtype: object

In [28]:

```
car_sales.loc[3]
```

Out[28]:

MakeBMW
ColourBlack
Odometer (KM)11179
Doors5
Price\$22,000.00
Name: 3, dtype: object

car_sales["Make"]

In [29]:

```
car_sales[car_sales["Odometer (KM)"]>10000]
```

Out[29]:

	Make	Colour	Odometer (KM)	Doors	Price
0	Toyota	White	150043	4	\$4,000.00
1	Honda	Red	87899	4	\$5,000.00
2	Toyota	Blue	32549	3	\$7,000.00
3	BMW	Black	11179	5	\$22,000.00
4	Nissan	White	213095	4	\$3,500.00
5	Toyota	Green	99213	4	\$4,500.00
6	Honda	Blue	45698	4	\$7,500.00
7	Honda	Blue	54738	4	\$7,000.00
8	Toyota	White	60000	4	\$6,250.00
9	Nissan	White	31600	4	\$9,700.00

In [30]:

```
pd.crosstab(car_sales["Make"], car_sales["Doors"])
```

Out[30]:

Doors	3	4	5
Make			
BMW	0	0	1
Honda	0	3	0
Nissan	0	2	0
Toyota	1	3	0

In [31]:

```
car_sales.groupby(["Make"]).max()
```

Out[31]:

	Colour	Odometer (KM)	Doors	Price
Make				
BMW	Black	11179	5	\$22,000.00
Honda	Red	87899	4	\$7,500.00
Nissan	White	213095	4	\$9,700.00
Toyota	White	150043	4	\$7,000.00

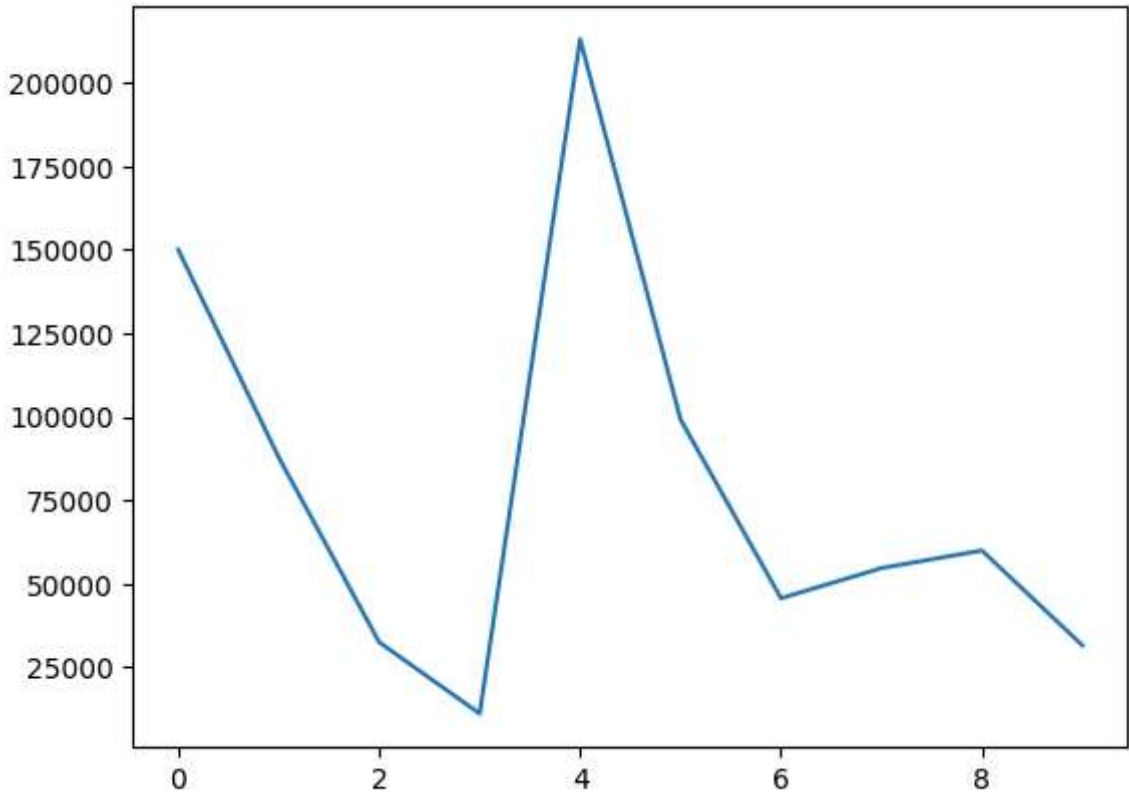
In []:

In [32]:

```
import matplotlib.pyplot as plt
```

In [39]:

```
car_sales["Odometer (KM)"].plot();
```



```
In [47]: car_sales["Price"]=car_sales["Price"].str[:-2]
car_sales
```

Out[47]:

	Make	Colour	Odometer (KM)	Doors	Price
0	Toyota	White	150043	4	
1	Honda	Red	87899	4	
2	Toyota	Blue	32549	3	
3	BMW	Black	11179	5	
4	Nissan	White	213095	4	
5	Toyota	Green	99213	4	
6	Honda	Blue	45698	4	
7	Honda	Blue	54738	4	
8	Toyota	White	60000	4	
9	Nissan	White	31600	4	

```
In [48]: car_sales["Make"].str.lower()
```

```
Out[48]: 0    toyota
          1    honda
          2    toyota
          3      bmw
          4    nissan
          5    toyota
          6    honda
          7    honda
          8    toyota
          9    nissan
          Name: Make, dtype: object
```

```
In [ ]:
```