

9-simple-linear-regression-tilak

October 20, 2024

1 Simple Linear Regression

Aim: Simple Linear Regression

Experiment no.: 9

```
[ ]: #Name:Aniket Khatkhede  
    #Roll no.: 63  
    #Sec : A  
    #Year: 3rd Year  
    #Sub: DSS
```

```
[2]: import pandas as pd
```

```
[3]: from matplotlib import pyplot as plt
```

```
[4]: import numpy as np
```

```
[5]: import os
```

```
[6]: os.getcwd()
```

```
[6]: 'C:\\Users\\hp\\Desktop\\DSS Practicals'
```

```
[7]: os.chdir('C:\\Users\\HP\\Desktop')
```

```
[8]: df=pd.read_csv("Salary_dataset.csv")
```

```
[9]: df.head()
```

```
[9]:
```

	Unnamed: 0	YearsExperience	Salary
0	0	1.2	39344.0
1	1	1.4	46206.0
2	2	1.6	37732.0
3	3	2.1	43526.0
4	4	2.3	39892.0

```
[10]: df.tail()
```

```
[10]:      Unnamed: 0  YearsExperience      Salary
      25          25              9.1  105583.0
      26          26              9.6  116970.0
      27          27              9.7  112636.0
      28          28             10.4  122392.0
      29          29             10.6  121873.0
```

```
[11]: df.info()
```

```
<class 'pandas.core.frame.DataFrame'>
RangeIndex: 30 entries, 0 to 29
Data columns (total 3 columns):
#   Column          Non-Null Count  Dtype
---  -
0   Unnamed: 0      30 non-null    int64
1   YearsExperience 30 non-null    float64
2   Salary          30 non-null    float64
dtypes: float64(2), int64(1)
memory usage: 852.0 bytes
```

```
[12]: df.describe()
```

```
[12]:      Unnamed: 0  YearsExperience      Salary
count    30.000000      30.000000      30.000000
mean     14.500000       5.413333  76004.000000
std       8.803408       2.837888  27414.429785
min       0.000000       1.200000  37732.000000
25%       7.250000       3.300000  56721.750000
50%      14.500000       4.800000  65238.000000
75%      21.750000       7.800000 100545.750000
max      29.000000      10.600000 122392.000000
```

```
[13]: df.shape
```

```
[13]: (30, 3)
```

```
[14]: df.size
```

```
[14]: 90
```

```
[15]: df.ndim
```

```
[15]: 2
```

```
[16]: df.isnull().sum()
```

```
[16]: Unnamed: 0      0
      YearsExperience  0
      Salary         0
      dtype: int64
```

```
[17]: df.head()
```

```
[17]:   Unnamed: 0  YearsExperience  Salary
0         0         1.2  39344.0
1         1         1.4  46206.0
2         2         1.6  37732.0
3         3         2.1  43526.0
4         4         2.3  39892.0
```

```
[18]: df.columns
```

```
[18]: Index(['Unnamed: 0', 'YearsExperience', 'Salary'], dtype='object')
```

```
[19]: a=(1,2,3,4,5,6,7,8,9,10)
```

```
[20]: a[0]
```

```
[20]: 1
```

```
[21]: a[-1]
```

```
[21]: 10
```

```
[22]: a[9]
```

```
[22]: 10
```

```
[23]: a[-10]
```

```
[23]: 1
```

```
[24]: df.loc[4, 'Salary']
```

```
[24]: 39892.0
```

```
[25]: df.head()
```

```
[25]:   Unnamed: 0  YearsExperience  Salary
0         0         1.2  39344.0
1         1         1.4  46206.0
2         2         1.6  37732.0
3         3         2.1  43526.0
```

```
4          4          2.3  39892.0
```

```
[26]: df.loc[29]
```

```
[26]: Unnamed: 0          29.0  
      YearsExperience    10.6  
      Salary          121873.0  
      Name: 29, dtype: float64
```

```
[27]: df.head(30)
```

```
[27]: Unnamed: 0  YearsExperience  Salary  
0          0          1.2    39344.0  
1          1          1.4    46206.0  
2          2          1.6    37732.0  
3          3          2.1    43526.0  
4          4          2.3    39892.0  
5          5          3.0    56643.0  
6          6          3.1    60151.0  
7          7          3.3    54446.0  
8          8          3.3    64446.0  
9          9          3.8    57190.0  
10         10          4.0    63219.0  
11         11          4.1    55795.0  
12         12          4.1    56958.0  
13         13          4.2    57082.0  
14         14          4.6    61112.0  
15         15          5.0    67939.0  
16         16          5.2    66030.0  
17         17          5.4    83089.0  
18         18          6.0    81364.0  
19         19          6.1    93941.0  
20         20          6.9    91739.0  
21         21          7.2    98274.0  
22         22          8.0   101303.0  
23         23          8.3   113813.0  
24         24          8.8   109432.0  
25         25          9.1   105583.0  
26         26          9.6   116970.0  
27         27          9.7   112636.0  
28         28         10.4   122392.0  
29         29         10.6   121873.0
```

```
[28]: df.loc[4]
```

```
[28]: Unnamed: 0          4.0  
      YearsExperience    2.3
```

```
Salary          39892.0
Name: 4, dtype: float64
```

```
[29]: a=(1,2,3,4,5,6,7,8,9,10)
```

```
[30]: a[1:4]
```

```
[30]: (2, 3, 4)
```

```
[31]: df.iloc[1,2]
```

```
[31]: 46206.0
```

```
[32]: df.head()
```

```
[32]:
```

	Unnamed: 0	YearsExperience	Salary
0	0	1.2	39344.0
1	1	1.4	46206.0
2	2	1.6	37732.0
3	3	2.1	43526.0
4	4	2.3	39892.0

```
[33]: df.loc[1,'Salary']
```

```
[33]: 46206.0
```

```
[34]: x=df.iloc[:, :-1].values
```

```
[35]: y=df.iloc[:, -1].values
```

```
[36]: print(x)
```

```
[[ 0.  1.2]
 [ 1.  1.4]
 [ 2.  1.6]
 [ 3.  2.1]
 [ 4.  2.3]
 [ 5.  3. ]
 [ 6.  3.1]
 [ 7.  3.3]
 [ 8.  3.3]
 [ 9.  3.8]
[10.  4. ]
[11.  4.1]
[12.  4.1]
[13.  4.2]
[14.  4.6]
```

```
[15.  5. ]
[16.  5.2]
[17.  5.4]
[18.  6. ]
[19.  6.1]
[20.  6.9]
[21.  7.2]
[22.  8. ]
[23.  8.3]
[24.  8.8]
[25.  9.1]
[26.  9.6]
[27.  9.7]
[28. 10.4]
[29. 10.6]]
```

```
[37]: print(y)
```

```
[ 39344.  46206.  37732.  43526.  39892.  56643.  60151.  54446.  64446.
  57190.  63219.  55795.  56958.  57082.  61112.  67939.  66030.  83089.
  81364.  93941.  91739.  98274. 101303. 113813. 109432. 105583. 116970.
 112636. 122392. 121873.]
```

```
[38]: a=(1,2,3,4,5,6,7,8,9,10)
```

```
[39]: a[:2]
```

```
[39]: (1, 2)
```

```
[40]: a[2:]
```

```
[40]: (3, 4, 5, 6, 7, 8, 9, 10)
```

```
[41]: a[1:6:2]
```

```
[41]: (2, 4, 6)
```

```
[42]: a[1:6:1]
```

```
[42]: (2, 3, 4, 5, 6)
```

```
[43]: print(x)
```

```
[[ 0.  1.2]
 [ 1.  1.4]
 [ 2.  1.6]
 [ 3.  2.1]
 [ 4.  2.3]
```

```
[ 5.  3. ]
[ 6.  3.1]
[ 7.  3.3]
[ 8.  3.3]
[ 9.  3.8]
[10.  4. ]
[11.  4.1]
[12.  4.1]
[13.  4.2]
[14.  4.6]
[15.  5. ]
[16.  5.2]
[17.  5.4]
[18.  6. ]
[19.  6.1]
[20.  6.9]
[21.  7.2]
[22.  8. ]
[23.  8.3]
[24.  8.8]
[25.  9.1]
[26.  9.6]
[27.  9.7]
[28. 10.4]
[29. 10.6]]
```

```
[44]: print(y)
```

```
[ 39344.  46206.  37732.  43526.  39892.  56643.  60151.  54446.  64446.
  57190.  63219.  55795.  56958.  57082.  61112.  67939.  66030.  83089.
  81364.  93941.  91739.  98274. 101303. 113813. 109432. 105583. 116970.
 112636. 122392. 121873.]
```