

Simple Linear Regression

* Predict continuous numerical value

* Dataset → Salary with respect to exp of employees

* Importing the libraries

import numpy as np

import matplotlib.pyplot as plt

import pandas as pd

* Importing the Dataset

dataset = pd.read_csv('Salary-data.csv')

X = dataset.iloc[:, :-1].values

y = dataset.iloc[:, -1].values

* Splitting the Dataset into Training & Test Set

from sklearn.model_selection import train_test_split
X_train, X_test, y_train, y_test = train_test_split(X, y, test_size=1/3,
random_state=0)

* Training the Simple Linear Regression model on the Training Set

from sklearn.linear_model import LinearRegression

regressor = LinearRegression()

regressor.fit(X_train, y_train)

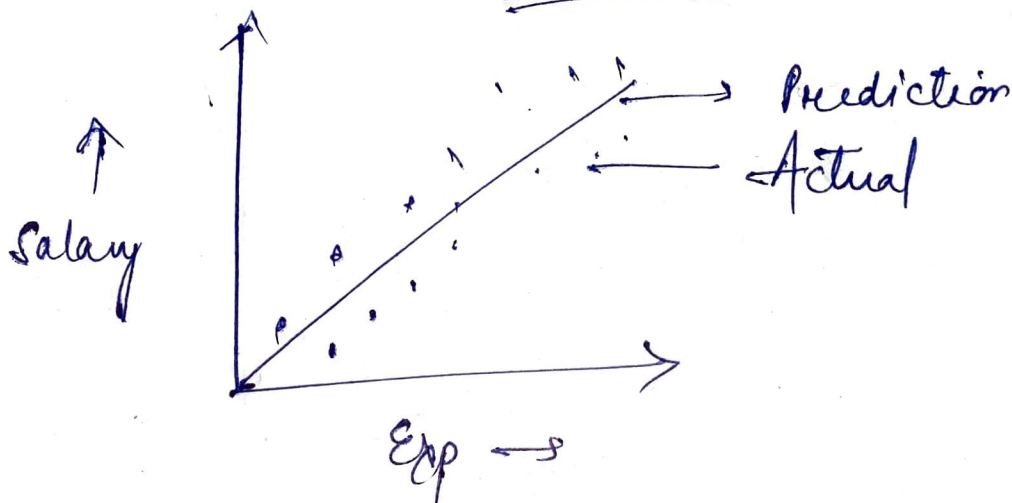
(2)
* Predicting the test set results

$y_{\text{pred}} = \text{regressor.predict}(X_{\text{test}})$

* Visualising the training set results

```
plt.scatter(X_train, y_train, color='red')  
plt.plot(X_train, regressor.predict(X_train), color='blue')  
plt.title('Salary vs Experience (Training set)')  
plt.xlabel('years of experience')  
plt.ylabel('salary')  
plt.show()
```

Salary vs Exp.



4 Visualizing test set results

```
plt.scatter(X_test, y_test, color='red')  
plt.plot(x_train, X_test, regressor.predict(X_test),  
         color='blue')
```

```
plt.title('Salary vs exp (Test set)')
```

```
plt.xlabel('years of experience')
```

```
plt.ylabel('Salary')
```

```
plt.show()
```

7ml Linear Regression frequently asked questions

(4)

Q1: How do I use my simple linear regression model to make a single prediction, for ex, to predict the salary of an employee with 12 years of experience?

Q2: How do I get final regression equation $y = b_0 + b_1x$ with the final values of the coefficients b_0 and b_1 ?

Ans 1: `point(regressor, predict([[12]]))`

* Value of feature (12 years) was put in a double pair of square brackets. That's because the predict method always expects a 2D array as the format of its inputs.

Ans 2: `point(regressor, coef-) → [9345.22]`
`point(regressor, intercept-) → 26816.192`

∴ Eq:

$$\text{Salary} = 9345.22 \times \text{years of exp} + 26816.192$$