Linear-Regression

January 14, 2025

```
[ ]: '''
     Simple Linear Regression ->

     Linear regression is a fundamental statistical technique used to model the␣
     ↪relationship between
     a dependent variable (also called the target or outcome) and one or more␣
     ↪independent variables
     (also called predictors or features). It assumes that the relationship␣
     ↪between the variables is linear,
     meaning that changes in the independent variables lead to proportional␣
     ↪changes in the dependent variable
     '''
```

```
[ ]: '''
     Equation -->

     y =  0 +  1x +

     y = Dependent Variable
     x = Independent Variable
      0 = Intercept
      1 = Slope
       = Error Term
     '''
```

```
[ ]: #   Importing Libraries -->

     import numpy as np
     import pandas as pd
     import matplotlib.pyplot as plt
     from sklearn.linear_model import LinearRegression
     from sklearn.model_selection import train_test_split
```

```
[ ]: #   Importing Dataset -->

     data = pd.read_csv('Data/Salary_Data.csv')
     data.head()
```

```
[ ]:    YearsExperience    Salary
     0              1.1   39343.0
     1              1.3   46205.0
     2              1.5   37731.0
     3              2.0   43525.0
     4              2.2   39891.0
```

```python
[6]: x_data = data.iloc[:, :-1].values
     y_data = data.iloc[:, -1].values
```

```python
[ ]: #    Splitting Dataset -->

     x_train, x_test, y_train, y_test = train_test_split(x_data, y_data, test_size =␣
      ↪0.2, random_state = 0)
```

```python
[ ]: #    Training Linear Regression Model -->

     reg = LinearRegression()
     reg.fit(x_train, y_train)
```

```python
[ ]: LinearRegression()
```

```python
[ ]: #    Predicting Test Set Results -->

     y_pred = reg.predict(x_test)
```

```python
[ ]: #    Visualising Training Set Results -->

     plt.scatter(x_train, y_train, color = 'red')
     plt.plot(x_train, reg.predict(x_train), color = 'blue')
     plt.title("Salary Prediction")
     plt.xlabel("Years Of Experience")
     plt.ylabel("Salary")
     plt.show()
```

Salary Prediction


```
# Visualising Test Set Results -->

plt.scatter(x_test, y_test, color = 'red')
plt.plot(x_train, reg.predict(x_train), color = 'blue')
plt.title("Salary Prediction")
plt.xlabel("Years Of Experience")
plt.ylabel("Salary")
plt.show()
```

Salary Prediction