

Assignments

Multiple Liner Regression

Multiple Variables of Data

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- Feature - output
- Input Data - Predication
- InDependent Variables - Dependent Variables

```
In [7]: # import Libraries
import pandas as pd
df = ('ML-Salary-Data.csv')
df = pd.read_csv(df)
df.head()
```

```
Out[7]:
```

	age	distance	YearsExperience	Salary
0	31.1	77.75	1.1	39343
1	31.3	78.25	1.3	46205
2	31.5	78.75	1.5	37731
3	32.0	80.00	2.0	43525
4	32.2	80.50	2.2	39891

Step 2 Splitting dataset into Training and testing data

```
In [8]: # Seprate the Features and Labels
X = df[['age', 'distance', 'YearsExperience']]
y = df['Salary']
```

```
In [9]: X.head()
```

```
Out[9]:
```

	age	distance	YearsExperience
0	31.1	77.75	1.1
1	31.3	78.25	1.3
2	31.5	78.75	1.5

	age	distance	YearsExperience
3	32.0	80.00	2.0
4	32.2	80.50	2.2

In [10]: `y.head()`

Out[10]:

```
0    39343
1    46205
2    37731
3    43525
4    39891
Name: Salary, dtype: int64
```

In [11]:

```
# Train Test Split
from sklearn.model_selection import train_test_split
X_train, X_test, y_train, y_test = train_test_split(X, y, test_size=0.3, random_state=1)
```

Step-3 Fit Linear Regression Model

In [16]:

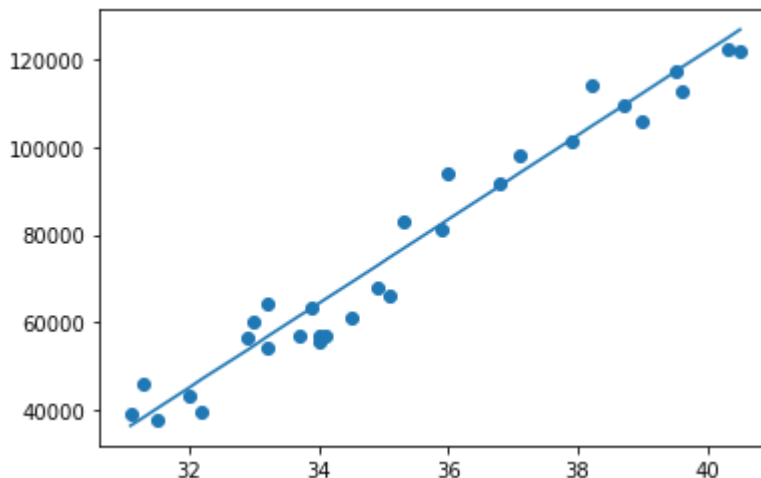
```
# test the model with the test data
from sklearn.linear_model import LinearRegression
model = LinearRegression().fit(X_train, y_train)
model
```

Out[16]: LinearRegression()

Step-4 Plotting

In [19]:

```
# plot the multiple linear regression
import matplotlib.pyplot as plt
plt.scatter(X['age'], y)
plt.plot(X['age'], model.predict(X))
plt.show()
```



In [20]: *# Testing the model with the test data*

```
y_pred = model.predict(X_test)
y_pred
```

```
Out[20]: array([ 91104., 109344., 56736., 82496., 40384., 118080., 117056.,
        74880., 112224.])
```

Step-5 Testing or Evaluating your Model

```
In [21]: # Print the coefficients
model.coef_
```

```
Out[21]: array([ 1.55256435e+16, -9.06218360e+15, 7.12981548e+15])
```

```
In [22]: # print the intercept
model.intercept_
```

```
Out[22]: 2.1389446432507773e+17
```

```
In [23]: # print the score of the model
model.score(X_test,y_test)
```

```
Out[23]: 0.973964442358535
```

Step-6 Predication of Unknow Value

```
In [29]: #predict a salary for a person with age 25, distance of 10 years of experience and 20 y
model.predict([[25,10,20]])
```

```
Out[29]: array([6.54010026e+17])
```

```
In [30]: model.predict(X_test)
```

```
Out[30]: array([ 91104., 109344., 56736., 82496., 40384., 118080., 117056.,
        74880., 112224.])
```

```
In [40]: model.predict(X_train)
```

```
Out[40]: array([124672., 63328., 45152., 38432., 83488., 101664., 64320.,
        53728., 69088., 36544., 94048., 47168., 56736., 65312.,
        61504., 72896., 126656., 104608., 54720., 76768., 64320.])
```