01_ML.Simple_linear_regression

1 Machine Learning

1.1 Simple Linear Regression

Step 0 Import Libraries

```
import pandas as pd
import numpy as np
import seaborn as sns
import matplotlib.pyplot as plt
```

Step-1 Import dataset

```
 df = pd.read_csv("salary_data.csv")
df.head()
```

	YearsExperience	Salary
0	1.1	39343
1	1.3	46205
2	1.5	37731
3	2.0	43525
4	2.2	39891

Step-2 Spliting dataset into training and testing data

```
 X = df[["YearsExperience"]]
y = df["Salary"]
from sklearn.model_selection import train_test_split
X_train, X_test, y_train, y_test = train_test_split(X,y,test_size=0.2,random_state=0)
```

Step-3 Fit Linear Regression Model

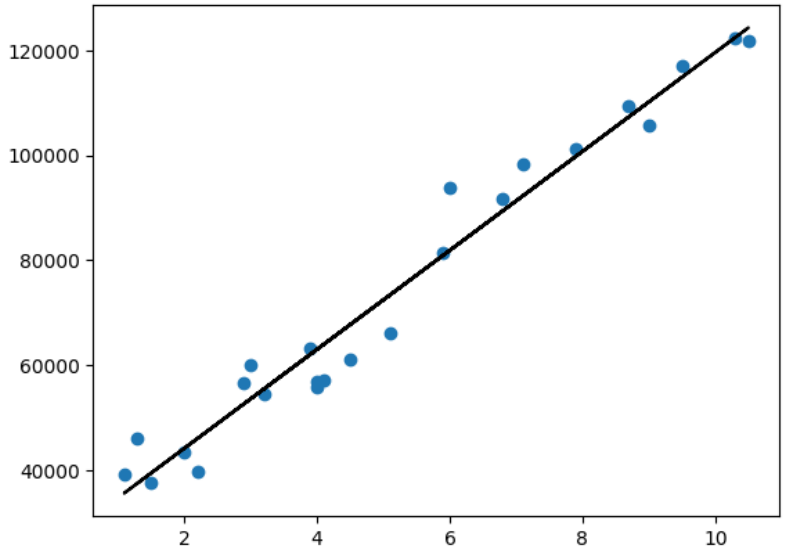
```
from sklearn.linear_model import LinearRegression
model = LinearRegression()
model = model.fit(X_train, y_train)
model
```

```
LinearRegression
LinearRegression()
```

Step-4 Plotting

```
import matplotlib.pyplot as plt
plt.scatter(X_train,y_train)
plt.plot(X_train.values, model.predict(X_train), color="black")
```

```
[<matplotlib.lines.Line2D at 0x7fd5167aa590>]
```



Step-5 Evaluating Model Fitness

```
# Model Fitness
print("Score for training data =" ,model.score(X_train, y_train))
print("Score for test data =" ,model.score(X_test, y_test))
```

```
Score for training data = 0.9645401573418146
Score for test data = 0.9024461774180497
```

Step-6 Prediction of unknown values

```
model.predict([[10],[15],[20]])
```

```
/usr/local/lib/python3.10/dist-packages/sklearn/base.py:439: UserWarning: X does not have valid feature names, but LinearRegression was fitted with feature names
  warnings.warn(
array([119559.73624209, 166678.81285724, 213797.8894724 ])
```

Step-7 Linear accuracy score

```
import numpy as np
import pandas as pd
from sklearn.model_selection import train_test_split
from sklearn.linear_model import LinearRegression
from sklearn.metrics import r2_score
X_train, X_test, y_train, y_test = train_test_split(X, y, test_size=0.2, random_state=42)
model = LinearRegression()
model.fit(X_train, y_train)
y_pred = model.predict(X_test)
accuracy = r2_score(y_test, y_pred)
print("Accuracy score:", accuracy)
```

```
Accuracy score: 0.9024461774180497
```