Write programme for linear regression

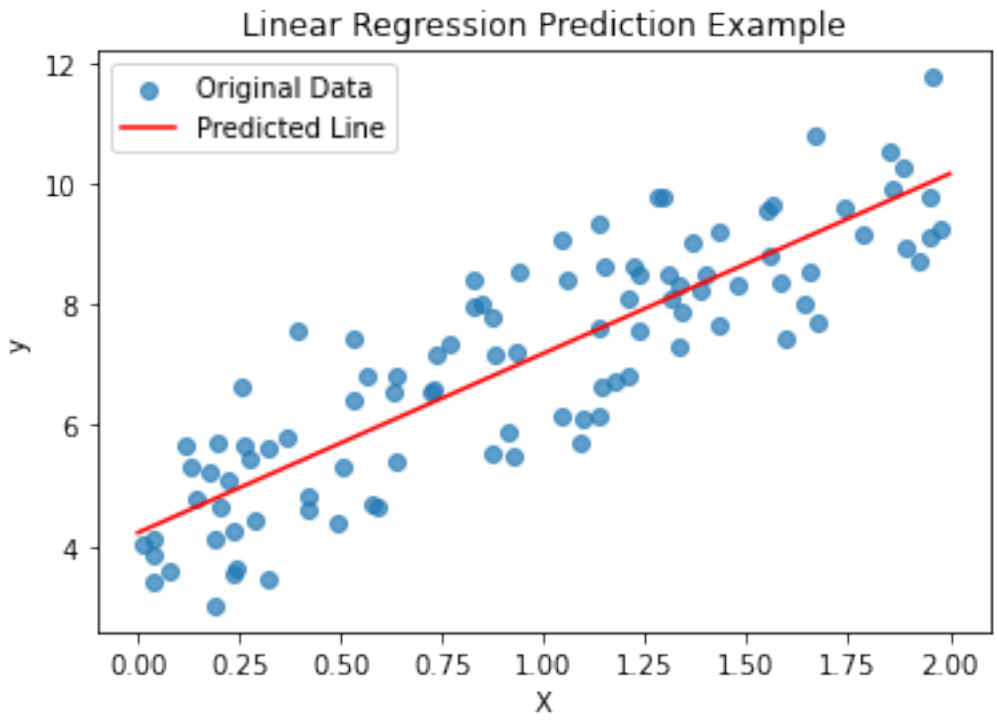
```
import numpy as np
from sklearn.linear_model import LinearRegression
from sklearn.metrics import r2_score, mean_squared_error
import matplotlib.pyplot as plt


# Generating random data for demonstration
np.random.seed(0)
X = 2 * np.random.rand(100, 1)
y = 4 + 3 * X + np.random.randn(100, 1)

# Creating a Linear Regression model
model = LinearRegression()

# Fitting the model to the data
model.fit(X, y)
```

```
LinearRegression()
```

```
# Generating new data for prediction
X_new = np.linspace(0, 2, 100).reshape(-1, 1)  # Generating 100 evenly
spaced values between 0 and 2

# Making predictions using the model
y_pred = model.predict(X_new)

# Evaluating the model
r2 = r2_score(y, model.predict(X))
mse = mean_squared_error(y, model.predict(X))

print("R-squared:", r2)
print("Mean Squared Error:", mse)
```

```
R-squared: 0.7469629925504755
Mean Squared Error: 0.9924386487246479
```

```
# Plotting the original data and the regression line
plt.scatter(X, y, alpha=0.7, label='Original Data')
plt.plot(X_new, y_pred, color='red', label='Predicted Line')
plt.xlabel('X')
plt.ylabel('y')
plt.title('Linear Regression Prediction Example')
plt.legend()
plt.show()
```


Linear Regression Prediction Example
Original Data
Predicted Line
12
10
8
6
4
y
0.00
0.25
0.50
0.75
1.00
1.25
1.50
1.75
2.00
X