6. Write a program to demonstrate linear regression using an appropriate dataset.

```
import numpy as np
```

```
import matplotlib.pyplot as plt
from sklearn.linear_model import LinearRegression
from sklearn.datasets import fetch_california_housing
from sklearn.model_selection import train_test_split
from sklearn.metrics import mean_squared_error, r2_score

# Load the California housing dataset (as Boston dataset is
deprecated)
housing = fetch_california_housing()

# Use only one feature for simplicity: e.g., average number of rooms
(MedInc)
X = housing.data[:, [0]]  # 'MedInc' feature
y = housing.target        # Target: house price

# Split the dataset into training and testing sets
X_train, X_test, y_train, y_test = train_test_split(X, y, test_size=0.2,
random_state=42)

# Create and train the model
model = LinearRegression()
model.fit(X_train, y_train)

# Predict using the model
y_pred = model.predict(X_test)


# Display model coefficients
print(f"Coefficient: {model.coef_[0]}")
print(f"Intercept: {model.intercept_}")

# Evaluate the model
print(f"Mean squared error: {mean_squared_error(y_test, y_pred):.2f}")
print(f"R² score: {r2_score(y_test, y_pred):.2f}")

# Plot outputs
plt.scatter(X_test, y_test, color='blue', label='Actual')
plt.plot(X_test, y_pred, color='red', linewidth=2, label='Predicted')
plt.title('Linear Regression: Predicting House Prices')
plt.xlabel('Median Income (MedInc)')
plt.ylabel('House Price')
plt.legend()
plt.show()
```

OUTPUT

```
Coefficient: 0.42801731927408824
Intercept: 0.4466031245082787
```

Mean squared error: 0.52
R^2 score: 0.47