

LABORATORY REPORT
Application Development Lab
(CS33002)

B.Tech Program in CSE

Submitted By

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Kalinga Institute of Industrial Technology
(Deemed to be University)
Bhubaneswar, India

Spring 2025-2026

Experiment Number	3
Experiment Title	Regression Analysis
Date of Experiment	14-01-2026
Date of Submission	21-01-2026

1. Objective:- Learn simple linear regression for predictive analysis.

2. Code:-

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

from sklearn.datasets import fetch_california_housing
from sklearn.model_selection import train_test_split
from sklearn.linear_model import LinearRegression
from sklearn.metrics import mean_squared_error, r2_score

housing = fetch_california_housing(as_frame=True)
df = housing.frame

plt.figure(figsize=(10, 6))
sns.heatmap(df.corr(), annot=True, cmap="coolwarm")
plt.title("Correlation Heatmap of California Housing Dataset")
plt.show()

X = df[['MedInc']]
y = df['MedHouseVal']

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)

mse = mean_squared_error(y_test, y_pred)
r2 = r2_score(y_test, y_pred)

print("Mean Squared Error:", mse)
print("R2 Score:", r2)

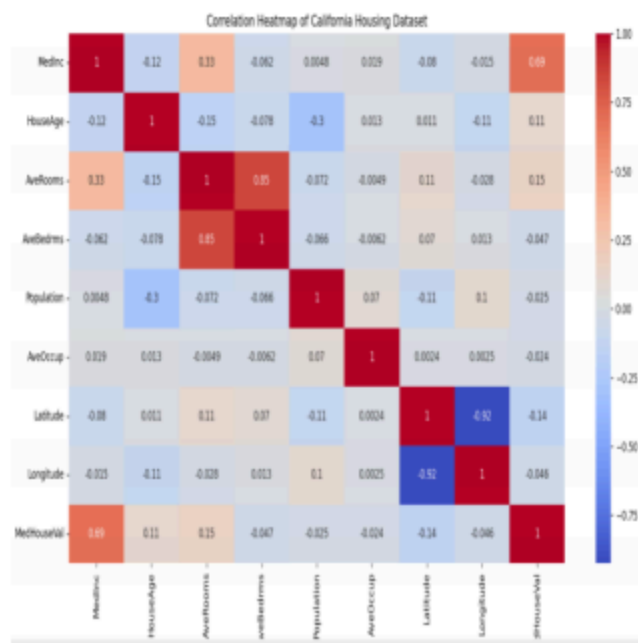
plt.figure(figsize=(8, 5))
plt.scatter(X_test, y_test, color='blue', label='Actual Values')
plt.plot(X_test, y_pred, color='red', linewidth=2, label='Regression Line')
plt.xlabel("Median Income")
plt.ylabel("House Price")
plt.title("Simple Linear Regression: House Price Prediction")
```

```
plt.legend()
plt.show()
```

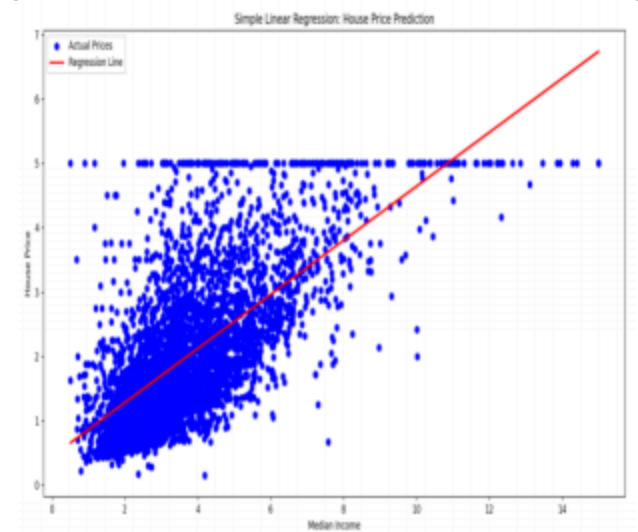
3. Results/Output:-

Mean Squared Error: 0.7091157771765548
R2 Score: 0.45885918903846656

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Roll number: 2305941

Signature of the Student

(Name of the Student)

Signature of the Lab Coordinator

(Name of the Coordinator)