Experiment: 3.1

Student Name: SANJIV GUPTA
UID: 21BCS-*3478*
Branch: CSE
Section/Group: 21BCS-IOT-602B
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1. **AIM:** *Evaluation of the performance of an algorithm: Mean Squared Error, Root Mean Squared Error.*

2. **Objective:**
The objective of this experiment is to evaluate the performance of an algorithm using two error metrics: Mean Squared Error (MSE) and Root Mean Squared Error (RMSE).

3. **Tools/Resource Used:**
1. *Python programming language.*
2. *Jupyter Notebook.*

4. **Algorithm:**

To Calculate MSE (Mean Squared Error)

- *Import the required libraries, typically NumPy.*
- *Define a function called calculate_mse that takes two input arrays: actual and predicted.*
- *Calculate the squared differences between the elements of the actual and predicted arrays.*
- *Compute the mean (average) of the squared differences using np.mean().*
- *Return the result as the Mean Squared Error (MSE).*

To Calculate RMSE (Root Mean Squared Error)

- *Import the required libraries, typically NumPy.*
- *Define a function called calculate_rmse that takes two input arrays: actual and predicted.*
- *Call the calculate_mse function inside calculate_rmse to obtain the MSE value.*
- *Calculate the square root of the MSE using np.sqrt() to get the RMSE.*
- *Return the result as the Root Mean Squared Error (RMSE).*

5. Program Code:

```
import numpy as np

def calculate_mse(actual, predicted):
    return np.mean((actual - predicted) ** 2)

def calculate_rmse(actual, predicted):
    mse = calculate_mse(actual, predicted)
    return np.sqrt(mse)

actual_values = [1, 2, 3, 4, 5]
predicted_values = [1.2, 1.8, 3.2, 4.5, 5.1]

mse = calculate_mse(actual_values, predicted_values)
rmse = calculate_rmse(actual_values, predicted_values)

print("Mean Squared Error (MSE):", mse)
print("Root Mean Squared Error (RMSE):", rmse)
```

6. Output/Result:

```
Mean Squared Error (MSE): 0.09799999999999999
Root Mean Squared Error (RMSE): 0.3130498008461792
```

7. Learning Outcomes:

1. *Implement to implement different python library.*
2. *Understand the concept of mse.*
3. *Understand the concept of rmse.*