Assignement-4: Naive Bayes Model
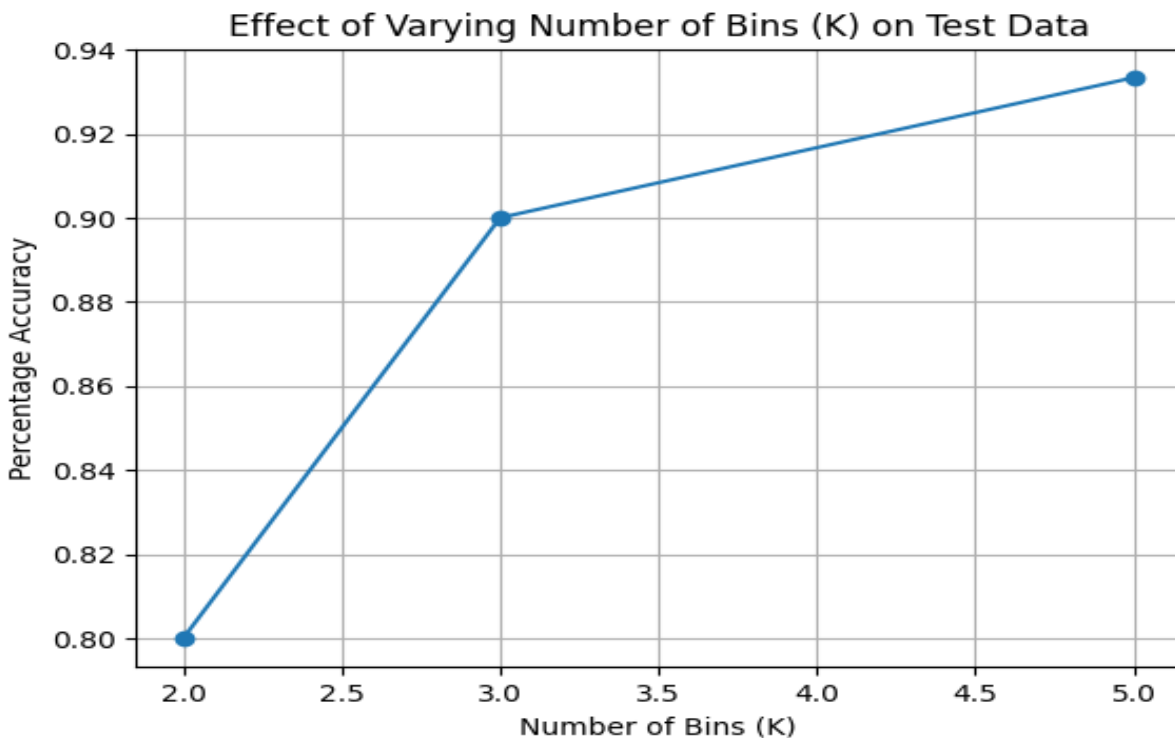
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#Experiment 1

In this experiment, we investigated the performance of the Naive Bayes Classifier with different number of bins (K). We measured the percentage accuracy achieved by the classifier for each value of K.

Results:

Effect of Varying Number of Bins (K) on Test Data

Observations:

Best value of K: 5 with accuracy: 93.33%

#Experiment 2

In this experiment, we evaluated the robustness of the Naive Bayes Classifier to noise in the training dataset. We introduced different levels of noise and measured the classifier's performance.

Results:

- Accuracy with 10.0% noise: 83.33%
- Accuracy with 40.0% noise: 73.33%
- Accuracy with 80.0% noise: 70.00%
- Accuracy with 90.0% noise: 70.00%
- Accuracy without noise: 93.33%

Observations:

- The Naive Bayes Classifier demonstrates good performance even under low to medium levels of noise, with accuracies ranging from 70.00% to 83.33%.
- However, at high levels of noise (80.0% and 90.0%), the accuracy drops to 70.00%, indicating a reduced ability to generalize in highly noisy environments.
- Comparatively, the classifier achieves the highest accuracy of 93.33% when trained on clean data without any noise.
- Overall, the classifier exhibits reasonable robustness to noise but may require additional preprocessing or tuning to handle highly noisy data effectively.