**ASSIGNMENT 5**

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**NEURAL NETWORK AND DEEP LEARNING**

**Video Link : https://drive.google.com/file/d/1kFRAsOdqwaOhAOQllcEHBhbDMf1sKB7i/view?usp=sharing**

1. Implement Naïve Bayes method using scikit-learn library

Use dataset available with name glass

Use train\_test\_split to create training and testing part

Evaluate the model on test part using score and

classification\_report(y\_true, y\_pred)

A screen shot of a computer program

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A computer screen shot of a program code

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Output

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A screenshot of a computer

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2. Implement linear SVM method using scikit library

Use the same dataset above

Use train\_test\_split to create training and testing part

Evaluate the model on test part using score and

classification\_report(y\_true, y\_pred)

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Output

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Based on the accuracies, the linear SVM model achieved a higher accuracy of 77%, compared to the Naïve Bayes model, which achieved an accuracy of 55.8%.

Here's a brief justification for why the linear SVM might have outperformed Naïve Bayes:

Complexity of Decision Boundary: SVM aims to find the hyperplane that best separates the classes, which can lead to a more flexible decision boundary compared to Naïve Bayes, especially when the classes are not linearly separable. This flexibility can result in better performance, especially when the data is more complex.

Handling Non-Linearity: While we used a linear SVM in this case, SVMs can employ various kernel functions to handle non-linear decision boundaries. This flexibility allows SVMs to capture more complex relationships in the data, potentially leading to higher accuracy.

Feature Independence Assumption: Naïve Bayes assumes that features are independent of each other given the class label. If this assumption is violated in the dataset, the performance of Naïve Bayes may degrade. In contrast, SVM does not make such assumptions about feature independence.