LAB ASSIGNMENT-5

Title: For a given set of training data examples stored in a .CSV file, implement and demonstrate various feature selection algorithms and compare the performance of the algorithms.

Objective: The objective of this lab assignment is to implement and demonstrate various feature selection algorithms on a given set of training data stored in a .CSV file. The goal is to compare the performance of these algorithms in terms of improving model accuracy and reducing dimensionality.

Dataset: Load a dataset of your choice or generate a synthetic dataset.

Tasks:

1) Implement and demonstrate the following feature selection algorithms:
   - Univariate feature selection (e.g., SelectKBest with chi-squared or mutual information scores)
   - Recursive feature elimination (RFE)
   - L1-based feature selection (Lasso regularization)
   - Tree-based feature selection (Random Forest or XGBoost feature importance)
2) Compare a machine learning model (e.g., a classification or regression model) performance using the original dataset without feature selection and with feature selection.
3) Visualize the performance metrics (e.g., accuracy) for each feature selection method using appropriate plots (e.g., bar chart or line plot).

Submission:
Prepare a PDF file that covers all the tasks mentioned above. Include code snippets, visualizations, and tables to support your analysis. Clearly explain the steps you took, the results you obtained, and your interpretation of the findings.

Additional Notes:
You can choose a dataset that aligns with your interests.