SCHOOL OF COMPUTER SCIENCE AND ARTIFICIAL INTELLIGENCE	DEPARTMENT OF COMPUTER SCIENCE ENGINEERING	
Program Name: B. Tech	**Assignment Type:** Lab	**Academic Year:** 2025-26
Course Coordinator Name	Dr.Vairachilai Shenbagavel	
Instructor(s) Name	Srinivas Komakula	

Course Code	23CA201SE402	**Course Title**	Explainable AI (P)
Year/Sem	III/V	**Regulation**	R24
Date and Day of Assignment	28-08-2025	**Time(s)**	09:00AM -05:00PM
Duration	2 Hours	**Applicable to Batch**	**23CSBTB43**

Assignment Number: 04

Q. No.	Question	Expected Time to complete
1	**20 Newsgroups (Text Classification)**	

Objectives:

- Use Permutation Importance to identify key words influencing text classification.
- Apply SHAP to visualize global importance of word features.
- Use LIME to explain two document predictions.
- Compare findings across methods.

Assignment Details:

- Goal: Understand how words drive text classification.
- Data: sklearn.datasets.fetch_20newsgroups(subset='train'/'test').
- Model: LogisticRegression with TF-IDF vectorization.

Steps:

- Train LogisticRegression pipeline with TF-IDF features.
- Permutation Importance: Rank word features globally.
- SHAP: Create summary plot + local force plot for one news article.
- LIME: Explain predictions for two different articles.
- Compare explanations across PI, SHAP, and LIME.

Deliverables:

- PI bar chart of word importance.
- SHAP summary + local explanation.
- LIME explanations for 2 documents.
- Comparative analysis.

Submission Requirements:

- Short methods summary (3–5 lines).
- Clean, runnable code/notebook.
- All required plots (PI, SHAP global + local, LIME local).
- 5–10 bullet insights highlighting consistencies and differences.