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**	**23CSBTB34**
Assignment Number: 04			

Q. No.	Question	Expected Time to complete
1	**Wine Quality (Multiclass Classification)**	

Objectives:

- Apply Permutation Importance to assess the role of chemical features.
- Use SHAP to explain wine class predictions globally and locally.
- Use LIME to interpret why specific wines are classified as type X or Y.
- Compare method agreement.

Assignment Details:

- Goal: Identify chemical properties that distinguish different wines.
- Data: sklearn.datasets.load_wine()
- Model: LogisticRegression (multi-class, standardized)

Steps:

- ✓ Train LogisticRegression.
- ✓ Permutation Importance: Compute global importance.
- ✓ SHAP: Summary plot + 1 local force plot.
- ✓ LIME: Explanations for two wines of different classes.
- ✓ Compare explanations across methods.

Deliverables:

- Permutation Importance plot.
- SHAP summary plot + 1 local plot.
- LIME for 2 wine samples.
- 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.