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**	**23CSBTB36**
Assignment Number: 04			

Q. No.	Question	Expected Time to complete
1	**Diabetes (Regression)**	

Objectives:

- Apply Permutation Importance for global ranking of medical risk factors.
- Use SHAP to analyze both global and local impacts on disease progression prediction.
- Use LIME to explain local predictions for two patients.
- Compare across all three methods.

Assignment Details:

- Goal: Explain how features like BMI, blood pressure, and age influence diabetes progression.
- Data: sklearn.datasets.load_diabetes()
- Model: GradientBoostingRegressor

Steps:

- 1. Train GradientBoostingRegressor.
- 2. Permutation Importance: Rank features globally.
- 3. SHAP: Summary plot + force plot for one patient.
- 4. LIME: Generate explanations for two patients.
- 5. Compare results across methods.

Deliverables:

- PI plot.
- SHAP summary + local plot.
- LIME explanations for two patients.
- 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.