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**	**23CSBTB38**
Assignment Number: 04			

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

Objectives:

- Use Permutation Importance to identify ecological features that affect penguin species classification.
- Apply SHAP to visualize global and local feature contributions.
- Use LIME to explain predictions for penguins from different islands.
- Compare alignment and divergence across methods.

Assignment Details:

- Goal: Interpret ecological predictors of penguin species.
- Data: seaborn load_dataset('penguins') (after dropping NaNs).
- Model: RandomForestClassifier

Steps:

- Train RandomForestClassifier.
- Permutation Importance: Rank key features (bill length, bill depth, flipper length).
- SHAP: Produce summary plot + force plot for one Gentoo penguin.
- LIME: Generate explanations for two penguins from different species.
- Compare across methods.

Deliverables:

- PI plot.
- SHAP summary + one force plot.
- LIME explanations for two penguins.
- 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.