Activity Tasks:(Individual Activity)

Part A: Theoretical Understanding (10 Marks)

1. **Define Explainable AI (XAI).**
   Explain its need and relevance in real-world applications.

2. **Compare and contrast** at least two XAI techniques:

   - Model-specific vs. Model-agnostic methods

   - Local vs. Global explanations

3. **Case Study Review:**
   Choose any one domain (Healthcare, Finance, Law, or Autonomous Vehicles) and summarize a real-life case where XAI played or could have played a crucial role.

Part B: Practical Implementation (15 Marks)

Use Python and any dataset of your choice (e.g., Titanic, Heart Disease, Breast Cancer, etc.). Use tools like **LIME**, **SHAP**, or **What-If Tool** or other tools

1. Train a classification model using any ML algorithm (Logistic Regression, Decision Tree, Random Forest, etc.).

2. Apply at least **two XAI tools** to interpret the model predictions:

   - Generate local and global explanations.

   - Visualize feature importance.

3. Answer the following:

   - Which features influenced the prediction the most?

   - Were there any unexpected or biased outcomes?

   - How would you present these results to a non-technical stakeholder?

Deliverables:

- PDF Report containing:
    - Answers to Part A
    - Screenshots and explanation of Part B
- Python Notebook (Jupyter/Colab) with comments
- A short reflection (150–200 words) on how XAI contributes to building trustworthy AI systems.
- **The demonstration of Activity will be conducted in Regular Lab.**