Project Report:

I have completed all the tasks (1, Bonus and 2) for the ML Module of Coding Club IIT Guwahati.

The reports for each part are as follows:

Task1 :

- I have loaded the dataset
- Found correlation and scatterplot for the anonymous Features with other known Features to predict the anonymous ones.
- Found the columns with missing data and filled them accordingly--- Mostly I have used KNN Imputer to maintain high accuracy for later Classifiers and used filling with Simple Imputer with Mean for columns with less Nan values.
- Asked relevant questions and explained them—Found ViolinPlot, Boxplot, ScatterPlot, Countplot to find correlations among various column features.
- Developed model to predict target column by Classifier Machine Learning Models—Used LogisticRegression, Random Forest, SVM(Support Vector Machine), XGBoost to get predictions of Target Column(Romantic) and also checked accuracy score of each model.
- Developed Decision Boundaries and SHAP to analyse the Classifier Models – Determined the background based on which the Classifiers got their predictions using SHAP and visualized the predictions using Decision Boundary.

Bonus Task:

- Based on Visual Clues like Complexity, Linearity and Shape of Boundary predicted the used Classifier Models for each of the 5 given Decision Boundaries

Task2:

- Developed Basic chatbot with BODMAS tools and showed the skeleton of the LLM model made using LangChain and LangGraph
- Used API keys to get Weather Forecast and Trending search for cities using LLM – Used OpenWeather and Tavily Search consecutively to get real time data.
- Integrated the tools/agents for performing Math operations, Forecast Weather and search Trends – Used the concept of Routing to connect tools with each other.
- Developed the multiagent system – Used the Concept of Supervisor node to develop Multiagent in LLM model.