Data Collection and Preprocessing Phase

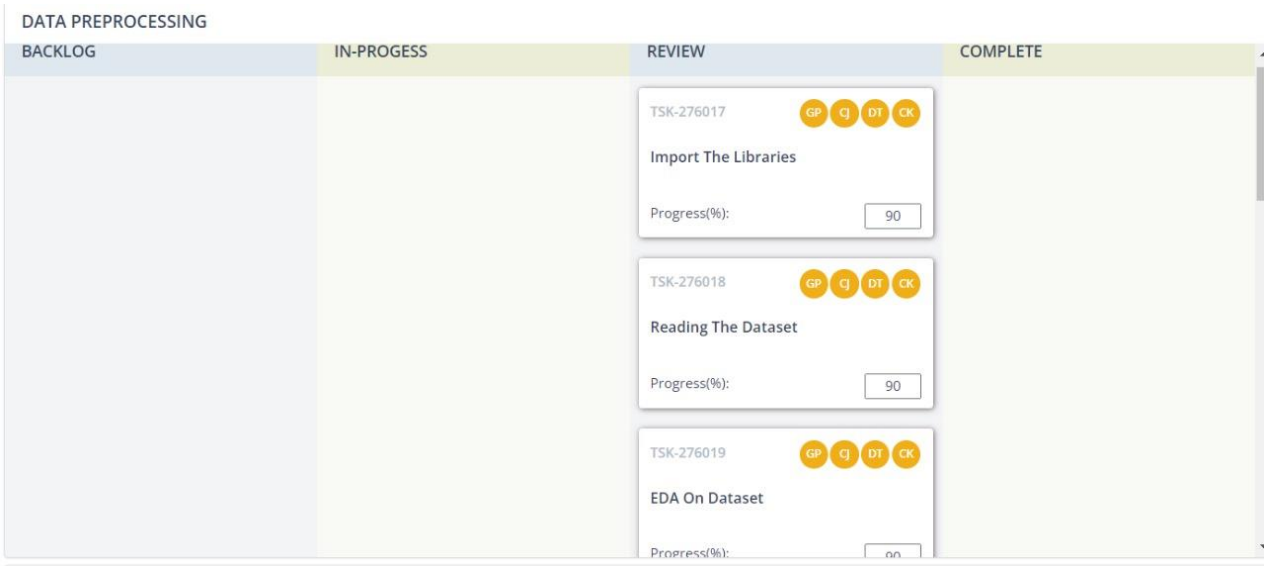
Date	15 August 2024
Team ID	LTVIP2024TMID24955
Project Title	SMS Spam Detection - AIML
Maximum Marks	6 Marks

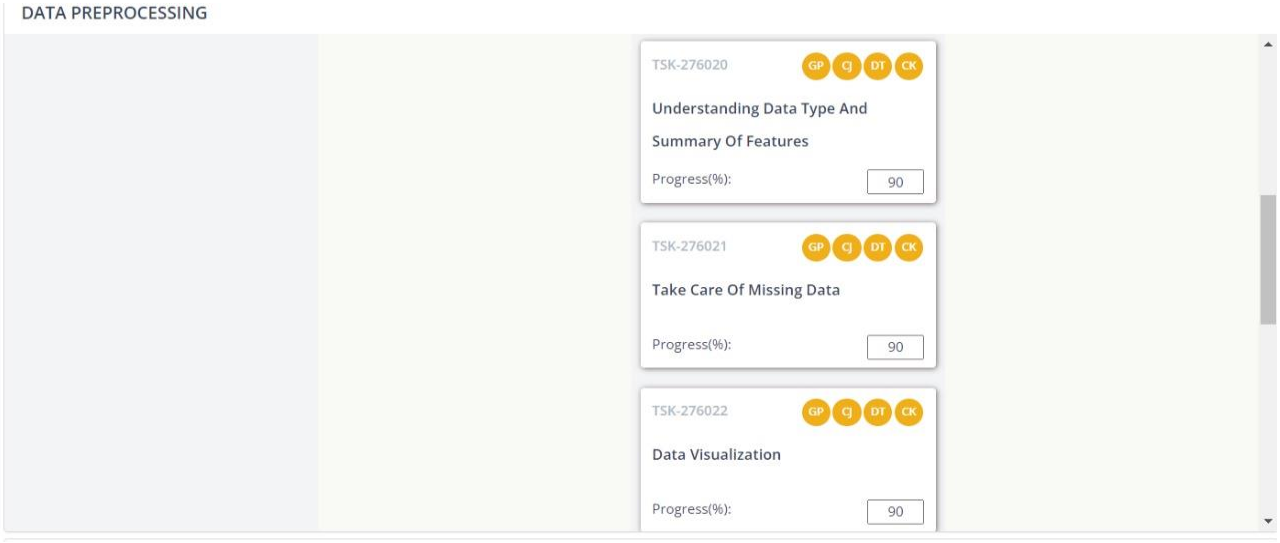
Data Exploration and Preprocessing Template

Identifies data sources, assesses quality issues like missing values and duplicates, and implements resolution plans to ensure accurate and reliable analysis.

Section	Description
1. Data Collection	Gathering SMS message data from reliable sources such as SMS datasets (e.g., public datasets, user-contributed data, or synthetic data). Includes both spam and non-spam messages for balanced classification..
2. Data Inspection	Examining the structure of the dataset, including attributes such as message content, labels (spam/not spam), and metadata e.g., time of message, sender info.
3.Exploratory Data Analysis (EDA)	Visualizing and analyzing the distribution of messages, word frequencies, and the relationship between message features (e.g., message length, most common words) and their labels (spam/not spam).
4. Data Cleaning	Removing or correcting noise such as duplicate messages, irrelevant content (e.g., system messages), and non-text characters (special symbols or emojis). Handling missing or incomplete data by filling in, removing, or imputing values.
5. Data Balancing	Addressing any class imbalance between spam and non-spam messages by applying techniques like oversampling

Data Preprocessing Code Screenshots





6. Text Preprocessing	Processing the raw text of SMS messages by converting to lowercase, removing stop words , punctuation, and stemming/lemmatizing. Transforming the text into a format suitable for machine learning models (e.g., tokenization).
7. Label Encoding	Converting the labels (spam, not spam) into a numerical format (e.g., 0 for not spam, 1 for spam) for use in machine learning models.
8. Data Splitting	Dividing the dataset into training, validation, and test sets to evaluate model performance.
9. Model Building	Developing a machine learning model to classify SMS messages as spam or not spam. This includes selecting appropriate algorithms like Multinomial Naïve base
10.Model Evaluation	Assessing the performance of the trained model using various evaluation metrics such as accuracy, precision, recall, F1-score, and AUC-ROC. This involves testing the model on the validation and test datasets