Capstone outline

1. **Problem Definition**:
   * Identify the problem
   * Define clear objectives and goals.
2. **Data Collection**:
3. **Data Cleaning and Preprocessing**:
   * handling missing values, outliers, and errors.
   * Perform preprocessing tasks such as normalization, standardization, or feature scaling.
   * Convert categorical variables into numerical representations - one-hot encoding or label encoding.
4. **Exploratory Data Analysis (EDA)**:
   * Understand the structure, relationships, and patterns.
   * Statistical summaries, visualizations (e.g., histograms, scatter plots, heatmaps), and correlation analysis to gain insights.
5. **Feature Engineering**:
   * Create new features or transform existing features.
   * polynomial features, interactions, transformations, and dimensionality reduction techniques (e.g., PCA).
6. **Model Selection**:
7. **Model Training**:
   * Split the data into training and validation/test sets.
   * Train the selected models using the training data.
   * Optimize model hyperparameters using techniques like grid search, random search, or Bayesian optimization.
8. **Model Evaluation**:
   * Evaluate model performance using appropriate metrics (accuracy, precision, recall, F1-score, RMSE, etc.).
   * Compare different models and select the best-performing one.
   * Use techniques like cross-validation to ensure robustness of the evaluation.
9. **Model Deployment**:
   * Deploy the trained model into production environment.
   * Integrate the model with existing systems or applications.
   * Monitor model performance and retrain/update as needed.

Draft Work

To combat illegal utilization of forest resources, you could consider the following

objectives: 1. Identifying Patterns: Analyze historical data to identify patterns of illegal poaching and logging, including locations, timing, and methods used. 2. Understanding Drivers: Conduct research to understand the underlying drivers of illegal activities, such as poverty, lack of alternative livelihoods, or weak enforcement.

3. Assessing Impacts: Evaluate the environmental, economic, and social impacts of illegal resource utilization on the forest ecosystem and local communities. 4. Stakeholder Engagement: Engage with local communities, government agencies, NGOs, and other stakeholders to raise awareness and build support for anti-poaching and anti-logging efforts.

5. Enhancing Enforcement: Strengthen law enforcement capacity through training, equipment provision, and collaboration with relevant authorities to deter illegal activities. 6. Promoting Sustainable Alternatives: Support the development of sustainable livelihood options for communities living near forests, reducing their reliance on forest resources.