Erfan Norozi —---------- 810102281

Part 1: Implementation Overview

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1. Object-Oriented Feature Selection Framework:
- Developed a comprehensive FeatureSelector class implementing 12 different feature selection methods
- Created flexible, modular code with consistent interfaces and extensive documentation
- Implemented robust parameter handling and validation
- Added support for both classification and regression tasks

2. Comparison Framework:
- Built an extensive comparison pipeline with 13 different classifiers
- Implemented three feature selection approaches (Ensemble, Random Forest, Boruta)
- Created comprehensive evaluation metrics and cross-validation
- Integrated advanced models including XGBoost, LightGBM, and Neural Networks

Part 2: Results Analysis

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1. Feature Selection Performance:
- Ensemble and Random Forest methods significantly outperformed Boruta:
** * Random Forest: 0.890 average accuracy**
** * Ensemble: 0.888 average accuracy**
** * Boruta: 0.752 average accuracy**

2. Classifier Performance:
- Top performing classifiers (average across methods):
** * XGBoost & LightGBM: 0.867**
** * SVM, ModelSelector, & GradientBoosting: 0.857**
** * Neural Network: 0.848**

3. Best Combinations:
- Overall best: Ensemble + Neural Network (0.943 accuracy)
- Consistent high performers:
** * SVM with Ensemble/RF: 0.914**
** * LightGBM with Ensemble/RF: 0.914**
** * XGBoost with RF: 0.914**

4. Method Stability:
- Ensemble and Random Forest methods showed consistent performance across classifiers
- Most models performed significantly better with Ensemble/RF compared to Boruta

- Traditional models (KNN, Decision Tree) showed lower but stable performance (0.819-0.829)

The analysis demonstrates that combining advanced feature selection (Ensemble/RF) with modern classifiers (Neural Network, XGBoost, LightGBM) provides the best performance for this dataset.