COE 292 project
Applying K-NN, SVL and ML

Team 03-12:

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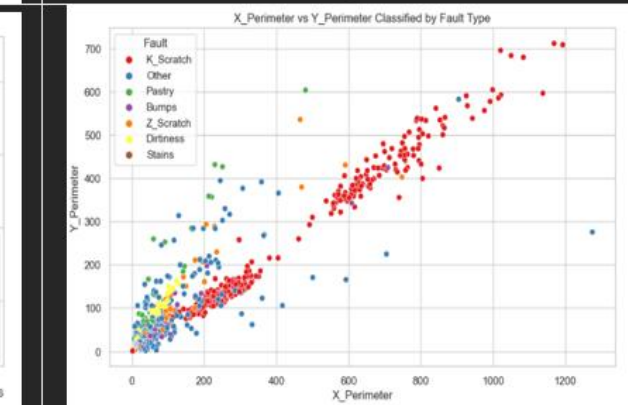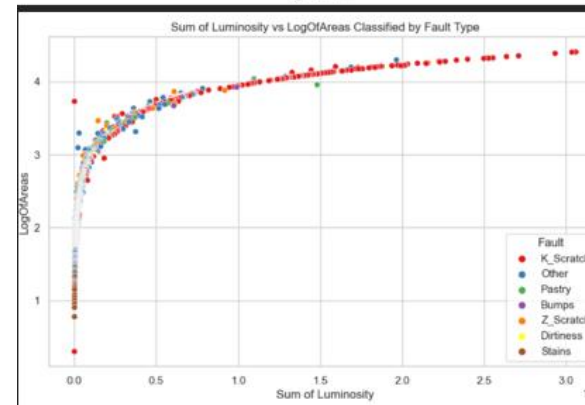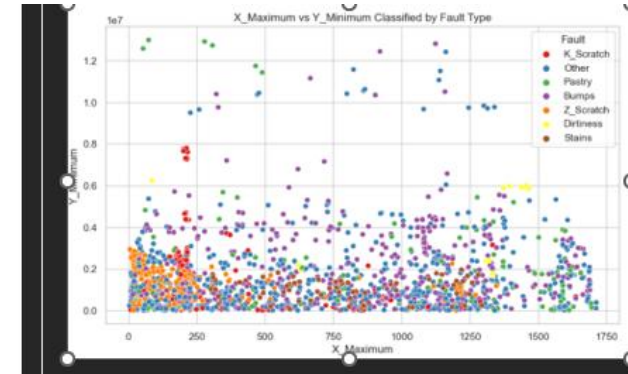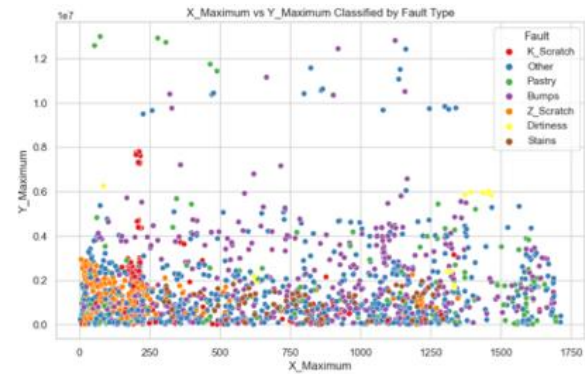
Najaf Bumijdad

Outline

- Introduction

- Applying/Results
  - K-NN
  - SVL
  - ML

- Conclusion

Introduction

- Steal faults dataset

- Contains :

    - 27 features

    - 7 targets

Applying K-NN to the Dataset
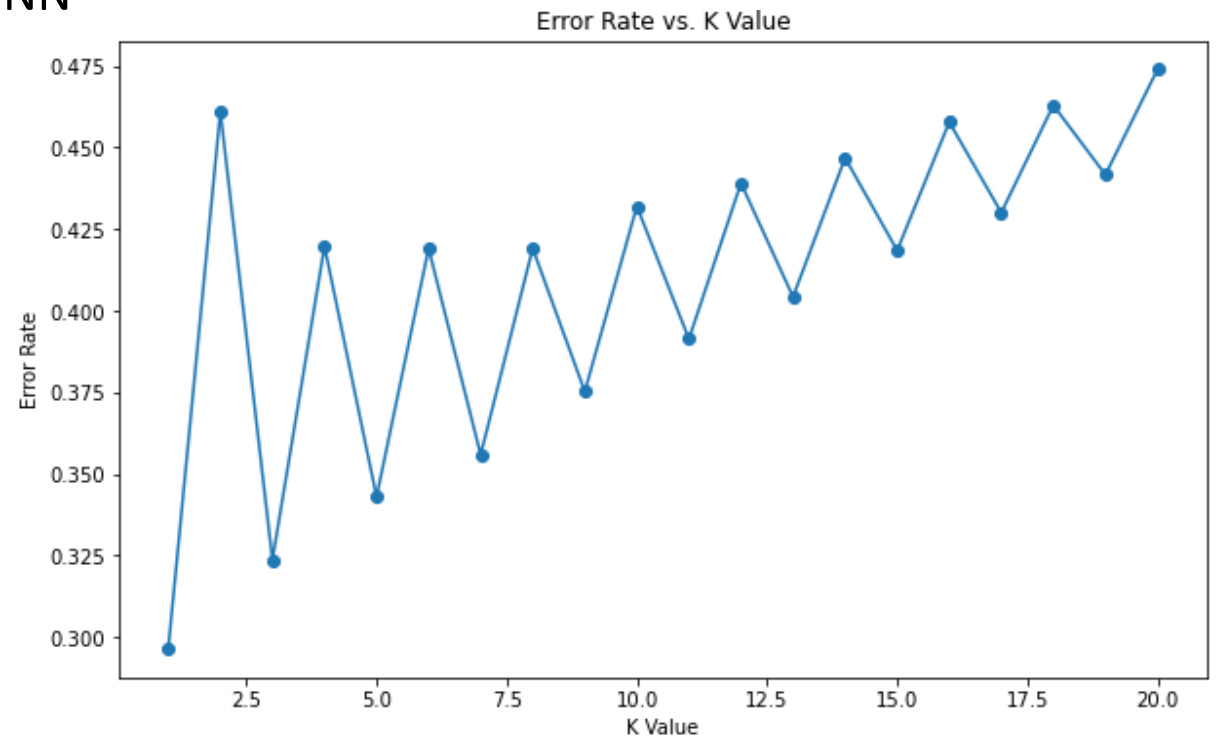
•**Scaling**:
Used StandardScaler to standardize features for K-NN

•**Choosing the Right Value of K:**
Values of K were tested (Range:1 to 20).

•**Distance Metric**:
 Used Euclidean distance (default) for K-NN.

Error Rate vs. K Value

Model Results and Evaluation

Performance Metrics:

- **Accuracy**: 0.7242

- **Precision (Macro Avg)**: 0.7527

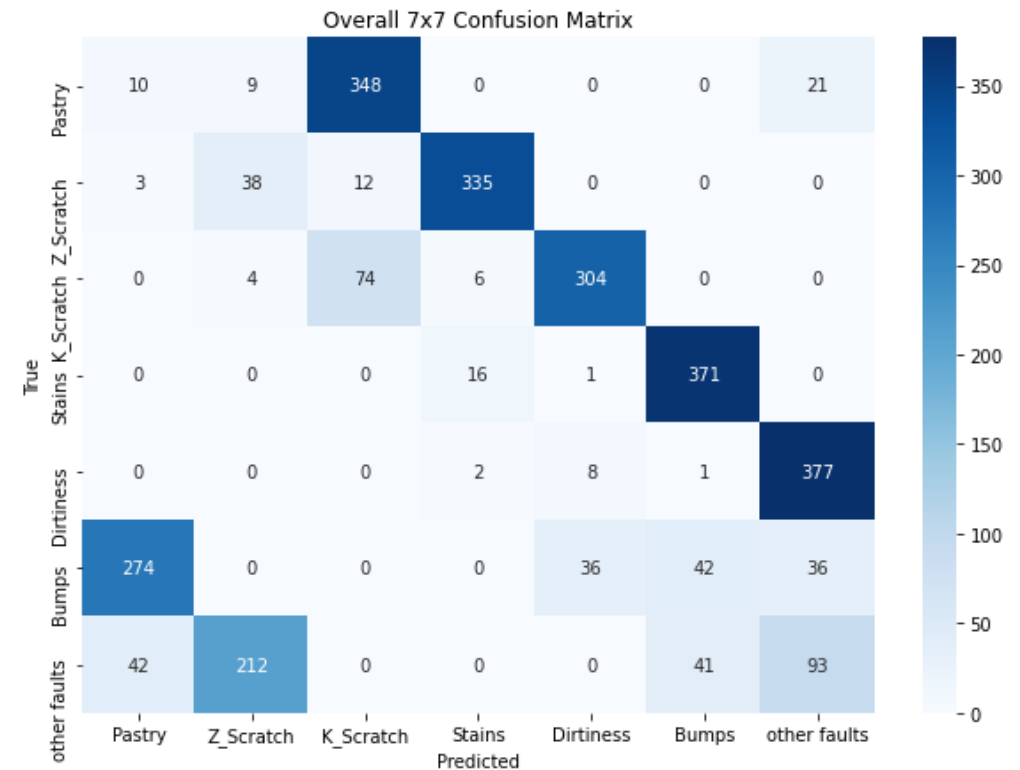- **Recall (Macro Avg)**: 0.7472

- **F1 Score (Macro Avg)**: 0.7448

Insights:

- **Good Performance**:

Overall accuracy of 72% but room for improvement.

- **Challenges**:

"Pastry" and "Other Faults" have low metrics, suggesting potential for class removal or improvements.

Applying SVM to the Dataset

- **Scaling**:
StandardScaler to standardize features for SVM

- **Support Vectors**
 Soft margin was more practical due to noise in the data

- **Kernal functions**:
 RBF kernel performed well.

Model Results and Evaluation

Performance Metrics:

- **Accuracy:** 76%

- **Precision:** 77%

- **Recall:** 76%

Cross-Validation:

- **10-fold** cross-validation

- **Avg Accuracy:** 71%