Model Performance Report

1. Logistic Regression

Parameters:

- class_weight={0: 2, 1: 1}
- penalty='l1'
- random_state=42
- solver='liblinear'

Accuracy: 85.2%

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2. K-Nearest Neighbors (KNN)

Parameters:

- algorithm='brute'
- metric='cosine'
- n_neighbors=16
- weights='distance'

Accuracy: 84.4%

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3. Random Forest

Parameters:

- criterion='entropy'
- max_features='log2'
- n_estimators=150
- random_state=42

Baseline Accuracy: 85.2%

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4. Support Vector Classifier (SVC)

Parameters:

- C=0.001
- break_ties=True

- class_weight='balanced'
- kernel='poly'
- probability=True
- random_state=42

Baseline Accuracy: 83.3%

Conclusion

The accuracy comparison across all four models is visualized in the following bar chart:

- **Logistic Regression** and **Random Forest** achieved the highest accuracy at **85.2%**.
- **K-Nearest Neighbors (KNN)** performed slightly lower at **84.4%**.
- **Support Vector Classifier (SVC)** had the lowest accuracy at **83.3%**.

Further optimization, such as hyperparameter tuning or feature selection, may improve model performance.