

## ORDINAL REGRESSION WITH A TABULAR WINE QUALITY MODELS TEAM PROJECT

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### MY Contribution

I significantly contributed to the ordinal regression project utilizing the tabular wine quality dataset. I presented three classification models, namely the Random Forest Classifier, K Neighbors Classifier, and Support Vector Machine (SVM) Classifier, to my team. Our research findings indicate that these models have a high level of accuracy in predicting wine quality based on the provided dataset. I assumed the duties of overseeing meetings, scheduling team collaboration, offering feedback to the instructor, and facilitating communication for the project's entirety. My contributions included technical expertise in model selection, as well as organizing and facilitating team collaboration, which played a crucial role in the project's success.

### Random Forest Classifier

The Random Forest Classifier is a machine-learning technique that uses multiple decision trees to predict outcomes, leveraging ensemble learning to improve accuracy and handle complex data patterns. It is a valuable tool for addressing classification challenges in machine learning. Fig1: Shows the result of my firsts model

[ ] model: RandomForestClassifier()				
	precision	recall	f1-score	support
3	1.00	0.00	0.00	2
4	1.00	0.00	0.00	18
5	0.72	0.77	0.74	271
6	0.57	0.65	0.61	242
7	0.51	0.38	0.43	96
8	1.00	0.09	0.17	11
accuracy			0.63	640
macro avg	0.80	0.31	0.33	640
weighted avg	0.64	0.63	0.61	640

Fig 1: Shows the result of Random Forest

### K Neighbors Classifier

The K Neighbors Classifier is a machine learning methodology that predicts the class of a data point based on its closest neighbors in the feature space. By considering the majority class among the k nearest neighbors, it achieves accurate predictions, making it significant in machine learning research. Fig2: Shows the result of my second model.

model: KNeighborsClassifier()				
	precision	recall	f1-score	support
3	1.00	0.00	0.00	2
4	0.00	0.00	0.00	18
5	0.61	0.69	0.65	271
6	0.47	0.54	0.50	242
7	0.46	0.26	0.33	96
8	1.00	0.00	0.00	11
accuracy			0.53	640
macro avg	0.59	0.25	0.25	640
weighted avg	0.53	0.53	0.51	640

Fig 2: Shows the result of the K Neighbors Classifier

## Support Vector Machine

The SVM (Support Vector Machine) Classifier is a classification technique that constructs a hyperplane in high-dimensional space to differentiate between different classes of data points. By optimizing the margin between the hyperplane and the nearest data points, it can handle classification scenarios with both linear and non-linear decision boundaries, making it a powerful tool in machine learning research.

Fig 3: Shows the result of my third model.

```
model: SVC()
      precision    recall  f1-score   support

     3         1.00      0.00      0.00         2
     4         1.00      0.00      0.00        18
     5         0.68      0.75      0.71       271
     6         0.52      0.67      0.58       242
     7         0.54      0.16      0.24         96
     8         1.00      0.00      0.00         11

 accuracy          0.59       640
 macro avg         0.79      0.26      0.26       640
 weighted avg         0.61      0.59      0.56       640
```

Fig 3: Shows the result of the Support Vector Machine

## Importance of Team Work

Teamwork fosters collaboration, enhances problem-solving abilities, promotes knowledge sharing, and enables the pooling of resources and skills, ultimately leading to more comprehensive and successful outcomes.