

Project Development Phase Model Performance Test

Date	21 November 2022
Team ID	PNT2022TMID49459
Project Name	Efficient Water Quality Analysis and prediction using Machine learning
Maximum Marks	10 Marks

Model Performance Testing:

Project team shall fill the following information in model performance testing template.

S.No.	Parameter	Values	Screenshot
1.	Model Summary	<p>Total params: 3279 rows,16 columns</p> <p>Trainable params: 3279 rows,16 columns</p> <p>Non-trainable params: 0</p>	<pre> 0.575 (0.029) with: {'criterion': 'entropy', 'min_samples_split': 2, 'splitter': 'best'} 0.573 (0.024) with: {'criterion': 'entropy', 'min_samples_split': 2, 'splitter': 'random'} 0.575 (0.034) with: {'criterion': 'entropy', 'min_samples_split': 4, 'splitter': 'best'} 0.571 (0.032) with: {'criterion': 'entropy', 'min_samples_split': 4, 'splitter': 'random'} 0.577 (0.034) with: {'criterion': 'entropy', 'min_samples_split': 6, 'splitter': 'best'} 0.578 (0.028) with: {'criterion': 'entropy', 'min_samples_split': 6, 'splitter': 'random'} 0.574 (0.033) with: {'criterion': 'entropy', 'min_samples_split': 8, 'splitter': 'best'} 0.578 (0.023) with: {'criterion': 'entropy', 'min_samples_split': 8, 'splitter': 'random'} 0.580 (0.029) with: {'criterion': 'entropy', 'min_samples_split': 10, 'splitter': 'best'} 0.582 (0.026) with: {'criterion': 'entropy', 'min_samples_split': 10, 'splitter': 'random'} 0.576 (0.028) with: {'criterion': 'entropy', 'min_samples_split': 12, 'splitter': 'best'} 0.584 (0.026) with: {'criterion': 'entropy', 'min_samples_split': 12, 'splitter': 'random'} 0.576 (0.024) with: {'criterion': 'entropy', 'min_samples_split': 14, 'splitter': 'best'} 0.585 (0.036) with: {'criterion': 'entropy', 'min_samples_split': 14, 'splitter': 'random'} Training Score: 90.11450381679388 Testing Score: 59.29878948786488 </pre>
2.	Accuracy	<p>Training Accuracy – 12.68</p> <p>Validation Accuracy – 13.07</p>	<pre> In [28]: prediction=dt.predict(X_test) print(f"Accuracy Score = {accuracy_score(Y_test,prediction)*100}") print(f"Confusion Matrix =\n {confusion_matrix(Y_test,prediction)}") print(f"Classification Report =\n {classification_report(Y_test,predic Accuracy Score = 56.859756897568975 Confusion Matrix = [[274 128] [155 99]] Classification Report = precision recall f1-score support 0 0.64 0.68 0.66 402 1 0.44 0.39 0.41 254 accuracy 0.57 656 macro avg 0.54 0.54 0.54 656 </pre>

Model Summary

```
0.575 (0.029) with: {'criterion': 'entropy', 'min_samples_split': 2, 'splitter': 'best'}
0.573 (0.024) with: {'criterion': 'entropy', 'min_samples_split': 2, 'splitter': 'random'}
0.575 (0.034) with: {'criterion': 'entropy', 'min_samples_split': 4, 'splitter': 'best'}
0.571 (0.032) with: {'criterion': 'entropy', 'min_samples_split': 4, 'splitter': 'random'}
0.577 (0.034) with: {'criterion': 'entropy', 'min_samples_split': 6, 'splitter': 'best'}
0.578 (0.028) with: {'criterion': 'entropy', 'min_samples_split': 6, 'splitter': 'random'}
0.574 (0.033) with: {'criterion': 'entropy', 'min_samples_split': 8, 'splitter': 'best'}
0.578 (0.023) with: {'criterion': 'entropy', 'min_samples_split': 8, 'splitter': 'random'}
0.580 (0.029) with: {'criterion': 'entropy', 'min_samples_split': 10, 'splitter': 'best'}
0.582 (0.026) with: {'criterion': 'entropy', 'min_samples_split': 10, 'splitter': 'random'}
0.576 (0.028) with: {'criterion': 'entropy', 'min_samples_split': 12, 'splitter': 'best'}
0.584 (0.026) with: {'criterion': 'entropy', 'min_samples_split': 12, 'splitter': 'random'}
0.576 (0.024) with: {'criterion': 'entropy', 'min_samples_split': 14, 'splitter': 'best'}
0.585 (0.036) with: {'criterion': 'entropy', 'min_samples_split': 14, 'splitter': 'random'}
Training Score: 90.11450381679388
Testing Score: 59.29878048780488
```

Accuracy

```
In [28]: prediction=dt.predict(X_test)
print(f"Accuracy Score = {accuracy_score(Y_test,prediction)*100}")
print(f"Confusion Matrix =\n {confusion_matrix(Y_test,prediction)}")
print(f"Classification Report =\n {classification_report(Y_test,prediction)}")

Accuracy Score = 56.859756097560975
Confusion Matrix =
[[274 128]
 [155  99]]
Classification Report =

```

	precision	recall	f1-score	support
0	0.64	0.68	0.66	402
1	0.44	0.39	0.41	254
accuracy			0.57	656
macro avg	0.54	0.54	0.54	656