

Project-Performance

Model Performance Test

Date	15 November 2023
Team ID	Team-591794
Project Name	USING MACHINE LEARNING TO PREDICT AND MONITER FETAL HEALTH
Maximum Marks	10 Marks

Metrics:

Accuracy-Score:

```
C:\> Fetal-AI-master > Fetal-AI-master > Model > Fetal_Health.ipynb > Requirements Gathering
+ Code + Markdown | ▶ Run All | ⌵ Clear All Outputs | ⌵ Outline ...

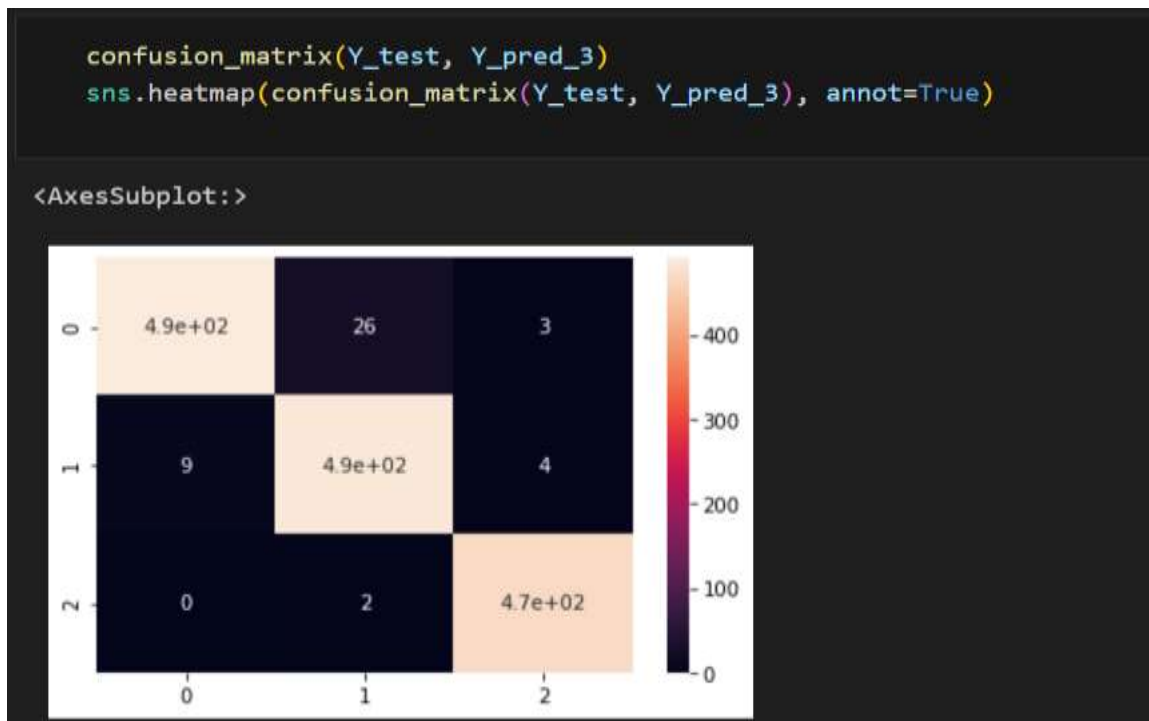
Metrics

from sklearn.metrics import accuracy_score, classification_report, confusion_matrix
acc = [accuracy_score(Y_test, Y_pred_1), accuracy_score(Y_test, Y_pred_2), accuracy_score(Y_test, Y_pred_3),
acc

[98]

... [0.6463087248322148,
0.9100671140939597,
0.9704697986577181,
0.9395973154362416,
0.885234899328859]
```

Confusion Matrix:



Classification-Report:

```
[91] print(classification_report(Y_test, Y_pred_3))
```

	precision	recall	f1-score	support
1.0	0.98	0.94	0.96	520
2.0	0.95	0.97	0.96	500
3.0	0.99	1.00	0.99	470
accuracy			0.97	1490
macro avg	0.97	0.97	0.97	1490
weighted avg	0.97	0.97	0.97	1490

Hyper-Parameter Tuning:

```
[31] params = {  
    'max_depth':[8,8,10],  
    'min_samples_leaf':[2,3],  
    'n_estimators':[80,90,100,110],  
    'max_features':[2,3,4,5]  
}
```

Pyth

Validation-Method:

Cross-Fold Validation with 2 folds


```
[34] from sklearn.model_selection import GridSearchCV  
  
grid_search = GridSearchCV(estimator=model3,  
                           param_grid = params,  
                           cv=2,  
                           verbose=1,  
                           scoring="accuracy")
```

Python

```
[35] grid_search.fit(X_train, Y_train)
```

Python

... Fitting 2 folds for each of 96 candidates, totalling 192 fits

... 

```
grid_search.best_score_
```

```
[36]
```

```
... 0.9493526794143389
```

```
rf_best=grid_search.best_estimator_  
rf_best
```

```
[37]
```

```
... * RandomForestClassifier  
RandomForestClassifier(max_depth=10, max_features=4, min_samples_leaf=2)
```

```
rf_classify=RandomForestClassifier(random_state=42,  
                                   n_jobs=-1,  
                                   max_depth=9,  
                                   min_samples_split=2,  
                                   max_features='sqrt',  
                                   n_estimators=90,  
                                   bootstrap=True)
```

```
[38]
```

```
rf_classify.fit(X_train,Y_train)
```

```
[40]
```

```
... * RandomForestClassifier  
RandomForestClassifier(max_depth=9, n_estimators=90, n_jobs=-1, random_state=42)
```