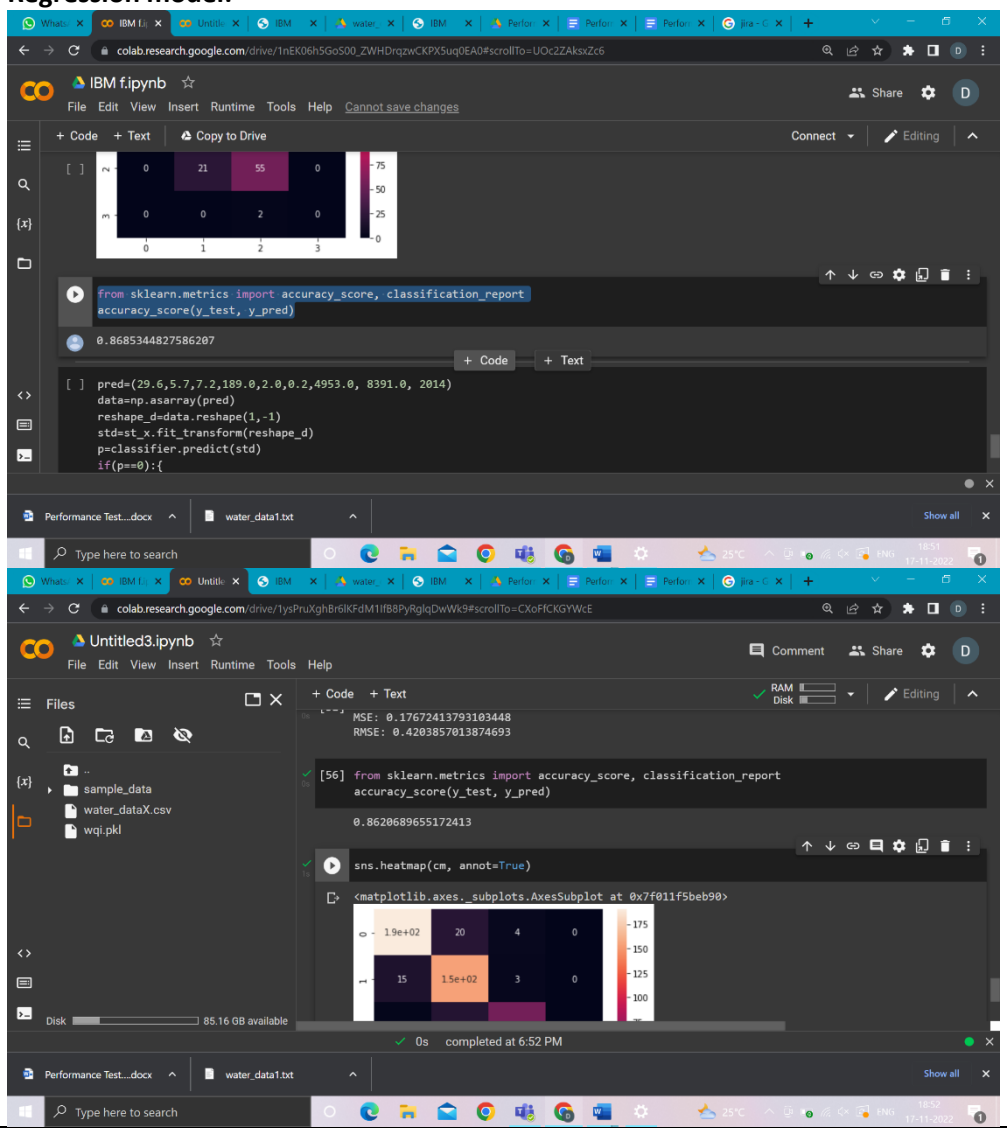
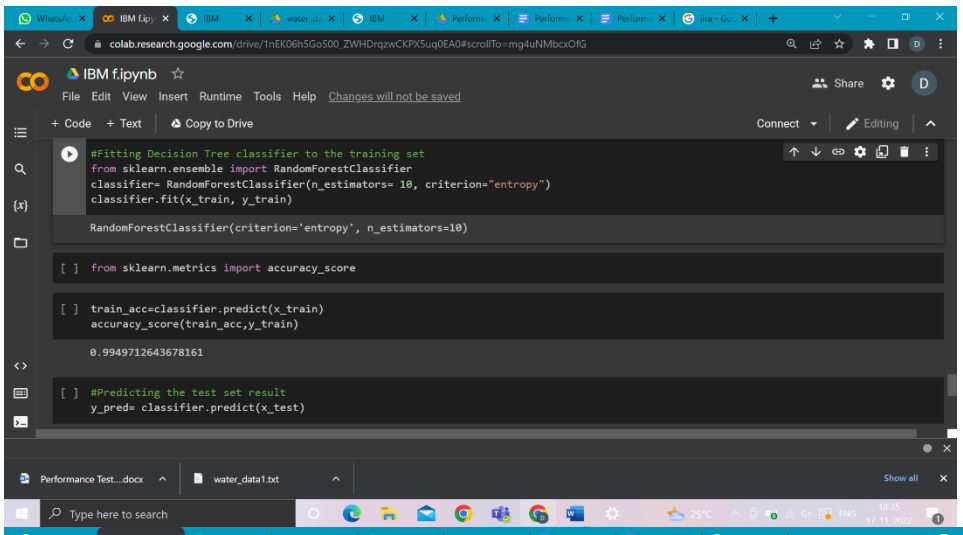
Project Development Phase
Model Performance Test

Date	16 November 2022
Team ID	PNT2022TMID14644
Project Name	Efficient Water Quality Analysis and Prediction Machine Learning
Maximum Marks	10 Marks

Model Performance Testing:

S.No.	Parameter	Values	Screenshot
1.	Metrics	**Regression Model:** MAE - , MSE - , RMSE - , R2 score - **Classification Model:** Confusion Matrix - , Accuray Score- & Classification Report -	**Regression model:** 

Classification Model :



```
#Fitting Decision Tree classifier to the training set
from sklearn.ensemble import RandomForestClassifier
classifier= RandomForestClassifier(n_estimators= 10, criterion="entropy")
classifier.fit(x_train, y_train)
```

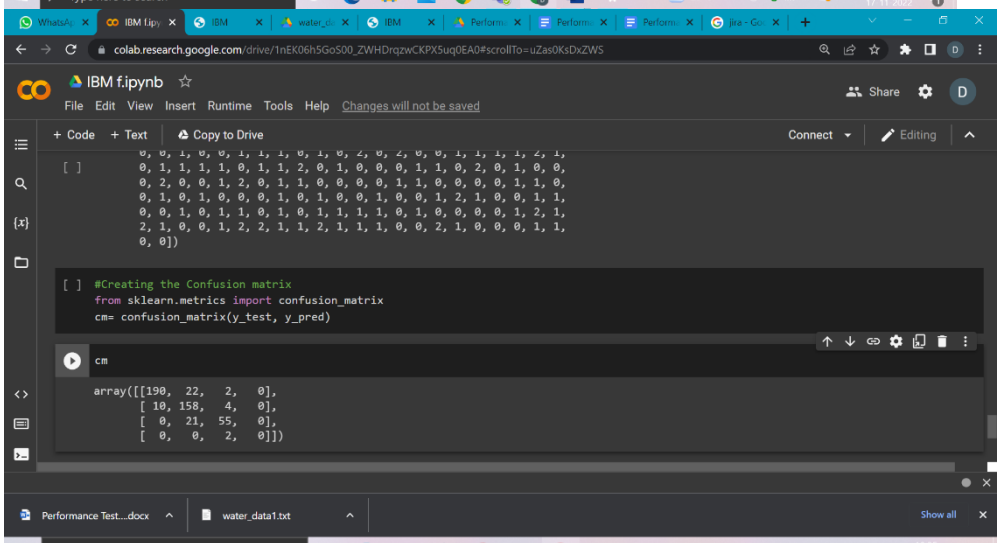
```
RandomForestClassifier(criterion='entropy', n_estimators=10)
```

```
from sklearn.metrics import accuracy_score
```

```
train_acc=classifier.predict(x_train)
accuracy_score(train_acc,y_train)
```

```
0.9949712643678161
```

```
#Predicting the test set result
y_pred= classifier.predict(x_test)
```

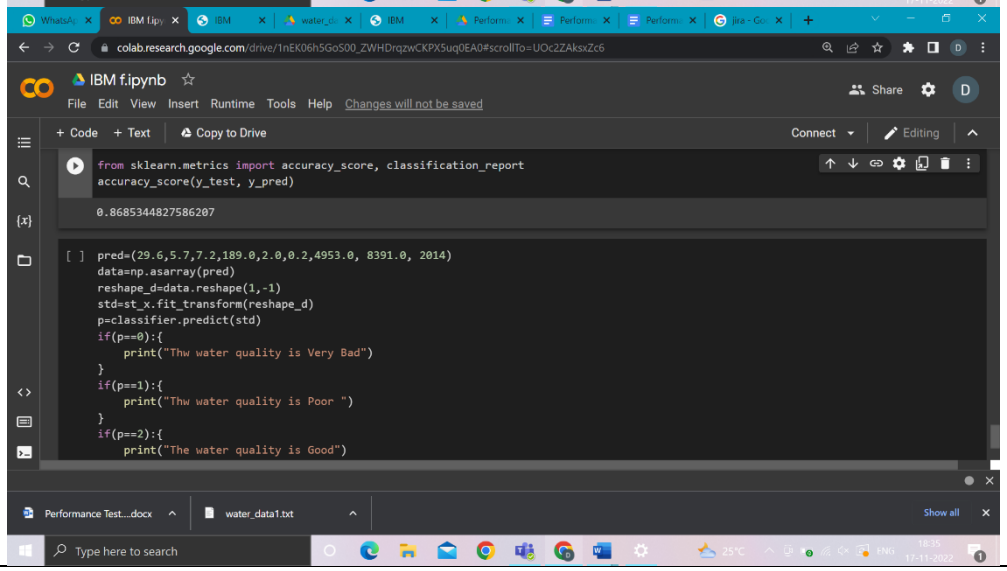


```
0, 0, 1, 0, 0, 1, 1, 1, 0, 1, 0, 2, 0, 2, 0, 0, 1, 1, 1, 2, 1,
0, 1, 1, 1, 1, 0, 1, 1, 2, 0, 1, 0, 0, 0, 1, 1, 0, 2, 0, 1, 0, 0,
0, 2, 0, 0, 1, 2, 0, 1, 1, 0, 0, 0, 0, 1, 1, 0, 0, 0, 0, 1, 1, 0,
0, 1, 0, 1, 0, 0, 0, 1, 0, 1, 0, 0, 1, 0, 0, 1, 2, 1, 0, 0, 1, 1,
0, 0, 1, 0, 1, 1, 0, 1, 0, 1, 1, 1, 1, 0, 1, 0, 0, 0, 0, 1, 2, 1,
2, 1, 0, 0, 1, 2, 2, 1, 1, 2, 1, 1, 1, 0, 0, 2, 1, 0, 0, 0, 1, 1,
0, 0])
```

```
#Creating the Confusion matrix
from sklearn.metrics import confusion_matrix
cm= confusion_matrix(y_test, y_pred)
```

```
cm
```

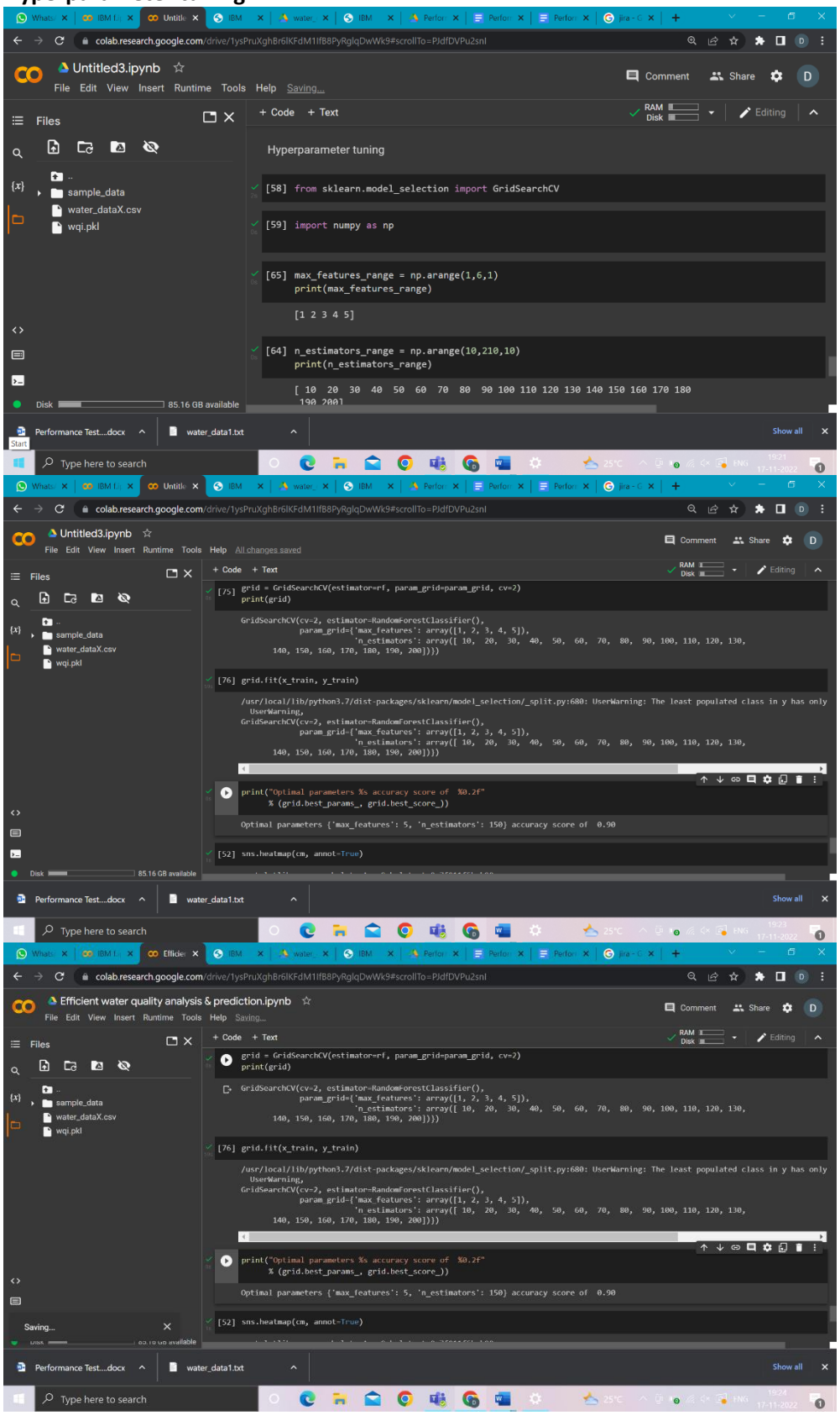
```
array([[190,  22,   2,   0],
       [ 10, 158,   4,   0],
       [  0,  21,  55,   0],
       [  0,   0,   2,   0]])
```



```
from sklearn.metrics import accuracy_score, classification_report
accuracy_score(y_test, y_pred)
```

```
0.8685344827586207
```

```
pred=(29.6,5.7,7.2,189.0,2.0,0.2,4953.0, 8391.0, 2014)
data=np.asarray(pred)
reshape_d=data.reshape(1,-1)
std=st_x.fit_transform(reshape_d)
p=classifier.predict(std)
if(p==0):{
    print("Thw water quality is Very Bad")
}
if(p==1):{
    print("Thw water quality is Poor ")
}
if(p==2):{
    print("The water quality is Good")
```

2.	Tune the Model	Hyperparameter Tuning - Validation Method -	**Hyperparameter tuning :** 

Validation method :