Model Development Phase Template

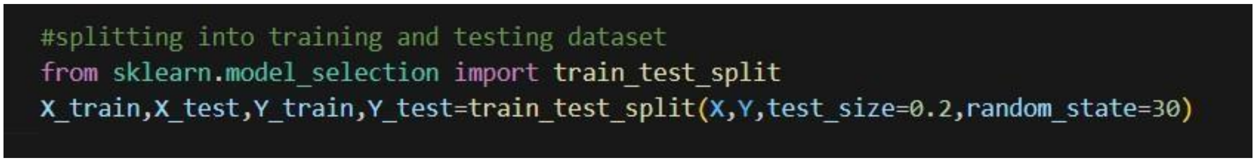
Date	03 June 2024
Team ID	739692
Project Title	Harvesting Brilliance : A Taxanomic Tale of Pumpkin Seeds Varieties
Maximum Marks	4 Marks

Initial Model Training Code, Model Validation and Evaluation Report

The initial model training code will be showcased in the future through a screenshot. The model validation and evaluation report will include classification reports, accuracy, and confusion matrices for multiple models, presented through respective screenshots.

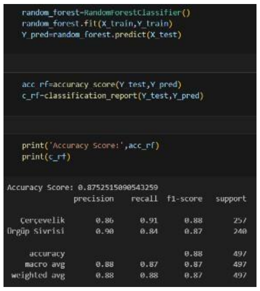
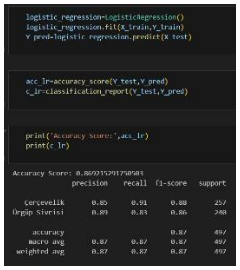
Model	Classification Report& Accuracy	Accuracy

Initial Model Training Code:



```
#splitting into training and testing dataset
from sklearn.model_selection import train_test_split
X_train,X_test,Y_train,Y_test=train_test_split(X,Y,test_size=0.2,random_state=30)
```

Model Validation and Evaluation Report:

Random forest classifier	 random_forest=RandomForestClassifier() random_forest.fit(X_train,Y_train) Y_pred=random_forest.predict(X_test) acc_rf=accuracy_score(Y_test,Y_pred) c_rf=classification_report(Y_test,Y_pred) print('Accuracy Score:',acc_rf) print(c_rf) Accuracy Score: 0.8752515090543259 precision recall f1-score support Çerçevelik 0.86 0.91 0.88 257 Ürgüp Sivrisi 0.90 0.84 0.87 240 accuracy 0.88 497 macro avg 0.88 0.87 0.87 497 weighted avg 0.88 0.88 0.87 497	0.875
Logistic regression	 logistic_regression=LogisticRegression() logistic_regression.fit(X_train,Y_train) Y_pred=logistic_regression.predict(X_test) acc_lr=accuracy_score(Y_test,Y_pred) c_lr=classification_report(Y_test,Y_pred) print('Accuracy Score:',acc_lr) print(c_lr) Accuracy Score: 0.869215291750503 precision recall f1-score support Çerçevelik 0.85 0.91 0.88 257 Ürgüp Sivrisi 0.89 0.83 0.86 240 accuracy 0.87 497 macro avg 0.87 0.87 0.87 497 weighted avg 0.87 0.87 0.87 497	0.86

<table>
<tr>
<td>Decision Tree classifier</td>
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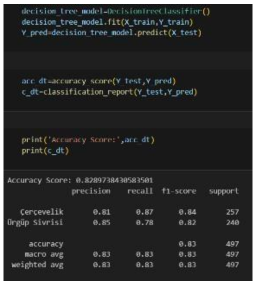

```
decision_tree_model-DecisionTreeClassifier()
decision_tree_model.fit(X_train,Y_train)
Y_pred=decision_tree_model.predict(X_test)


acc dt=accuracy score(Y test,Y pred)
c_dt-classification_report(Y_test,Y_pred)


print('Accuracy Score:',acc dt)
print(c_dt)

Accuracy Score: 0.8289738430583501
              precision    recall  f1-score   support

   Çerçevelik       0.81      0.87      0.84       257
Ürgüp Sivrisi       0.85      0.78      0.82       240

     accuracy                           0.83       497
    macro avg       0.83      0.83      0.83       497
 weighted avg       0.83      0.83      0.83       497
```

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<td>0.82</td>
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<td>Naïve Bayes</td>
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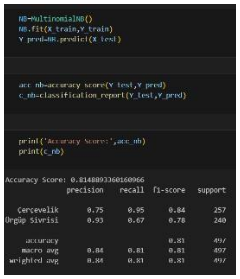

```
NB-MultinomialNB()
NB.fit(X_train,Y_train)
Y pred-NB.predict(X test)


acc nb-accuracy score(Y test,Y pred)
c_nb-classification_report(Y_test,Y_pred)


print('Accuracy Score:',acc_nb)
print(c_nb)

Accuracy Score: 0.8148893360160966
              precision    recall  f1-score   support

   Çerçevelik       0.75      0.95      0.84       257
Ürgüp Sivrisi       0.93      0.67      0.78       240

     accuracy                           0.81       497
    macro avg       0.84      0.81      0.81       497
 weighted avg       0.84      0.81      0.81       497
```

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<td>Gradient Boosting Classifier</td>
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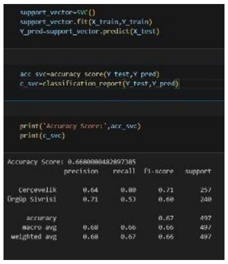

```
support_vector=SVC()
support_vector.fit(X_train,Y_train)
Y_pred-support_vector.predict(X_test)


acc svc=accuracy score(Y test,Y pred)
c_svc=classification_report(Y_test,Y_pred)


print('Accuracy Score:',acc_svc)
print(c_svc)

Accuracy Score: 0.6680080482897385
              precision    recall  f1-score   support

   Çerçevelik       0.64      0.80      0.71       257
Ürgüp Sivrisi       0.71      0.53      0.60       240

     accuracy                           0.67       497
    macro avg       0.68      0.66      0.66       497
 weighted avg       0.68      0.67      0.66       497
```

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<td>Support vector classifier</td>
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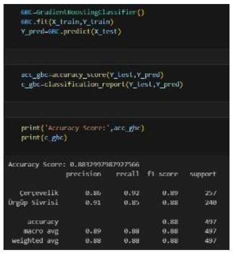

```
GBC-GradientBoostingClassifier()
GBC.fit(X_train,Y_train)
Y_pred-GBC.predict(X_test)


acc_gbc-accuracy_score(Y_test,Y_pred)
c_gbc-classification_report(Y_test,Y_pred)


print('Accuracy Score:',acc_gbc)
print(c_gbc)

Accuracy Score: 0.8832997987927566
              precision    recall  f1-score   support

   Çerçevelik       0.86      0.92      0.89       257
Ürgüp Sivrisi       0.91      0.85      0.88       240

     accuracy                           0.88       497
    macro avg       0.89      0.88      0.88       497
 weighted avg       0.88      0.88      0.88       497
```

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<td>0.88</td>
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