

Model Development Phase Template

Date	24 April 2024
Team ID	team-739848
Project Title	Identifying Airline Passenger Satisfaction Using Machine Learning
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.

Initial Model Training Code:

Decision Tree:

```
accuracy=model.score(X_test,Y_test)
print(["-----Decision Tree-----"])
print("Model accuracy\t\t",{accuracy})
print(f'Accuracy in Percentage\t{" {:.1%}".format(accuracy)}')
print(classification_report(Y_test,Y_pred))
```

Logistic Regression:

```
accuracy=model.score(X_test,Y_test)
print("-----Logistic Regression-----")
print("Model accuracy\t\t",{accuracy})
print(f'Accuracy in Percentage\t{" {:.1%}".format(accuracy)}')
print(classification_report(Y_test,Y_pred))
```

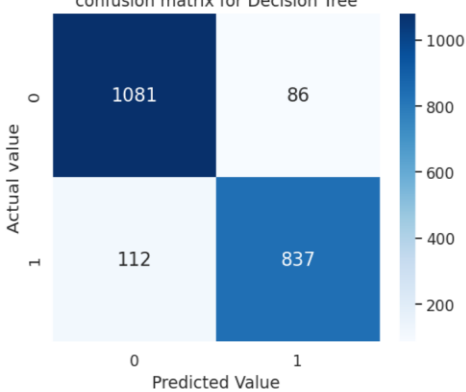
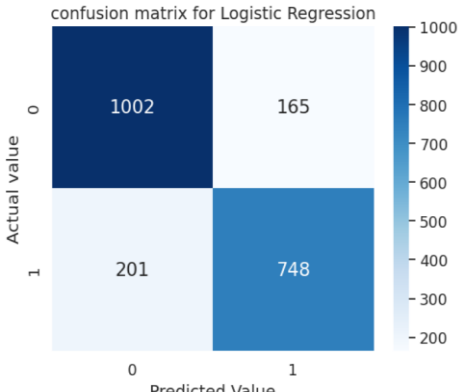
Random Forest:

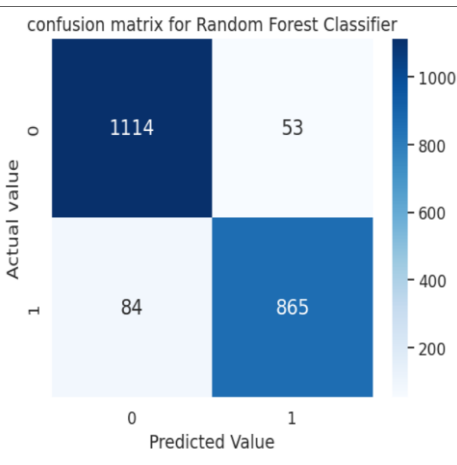
```
accuracy=model.score(X_test,Y_test)
print("-----RandomForest classifier-----")
print("Model accuracy\t\t",{accuracy})
print(f'Accuracy in Percentage\t{" {:.1%}".format(accuracy)}')
print(classification_report(Y_test,Y_pred))
```

K Nearest Nighbor:

```
accuracy=model.score(X_test,Y_test)
print("-----KNearest Neighbor-----")
print("Model accuracy\t\t",{accuracy})
print(f'Accuracy in Percentage\t{" {:.1%}".format(accuracy)}')
print(classification_report(Y_test,Y_pred))
```

Model Validation and Evaluation Report:

Model	Classification Report	Accuracy	Confusion Matrix									
Decision Tree	<pre>-----Decision Tree----- Model accuracy {0.9137562366357804} Accuracy in Percentage 91.4% precision recall f1-score support 1 0.92 0.93 0.92 2357 2 0.91 0.89 0.90 1852 accuracy 0.91 4209 macro avg 0.91 0.91 0.91 4209 weighted avg 0.91 0.91 0.91 4209</pre>	91.4%	 <table><caption>Confusion Matrix Data for Decision Tree</caption><thead><tr><th>Actual \ Predicted</th><th>0</th><th>1</th></tr></thead><tbody><tr><th>0</th><td>1081</td><td>86</td></tr><tr><th>1</th><td>112</td><td>837</td></tr></tbody></table>	Actual \ Predicted	0	1	0	1081	86	1	112	837
Actual \ Predicted	0	1										
0	1081	86										
1	112	837										
Logistic Regression	<pre>-----Logistic Regression----- Model accuracy {0.839391779520076} Accuracy in Percentage 83.9% precision recall f1-score support 1 0.85 0.87 0.86 2357 2 0.83 0.80 0.81 1852 accuracy 0.84 4209 macro avg 0.84 0.83 0.84 4209 weighted avg 0.84 0.84 0.84 4209</pre>	83.9%	 <table><caption>Confusion Matrix Data for Logistic Regression</caption><thead><tr><th>Actual \ Predicted</th><th>0</th><th>1</th></tr></thead><tbody><tr><th>0</th><td>1002</td><td>165</td></tr><tr><th>1</th><td>201</td><td>748</td></tr></tbody></table>	Actual \ Predicted	0	1	0	1002	165	1	201	748
Actual \ Predicted	0	1										
0	1002	165										
1	201	748										

Random Forest	<pre> -----RandomForest classifier----- Model accuracy {0.9453551912568307} Accuracy in Percentage 94.5% precision recall f1-score support 1 0.93 0.97 0.95 2357 2 0.96 0.91 0.94 1852 accuracy 0.95 4209 macro avg 0.95 0.94 0.94 4209 weighted avg 0.95 0.95 0.95 4209 </pre>	94.5%	<p>confusion matrix for Random Forest Classifier</p> 
K Nearest Neighbor	<pre> -----KNearest Neighbor----- Model accuracy {0.8933238298883345} Accuracy in Percentage 89.3% precision recall f1-score support 1 0.93 0.97 0.95 2357 2 0.96 0.91 0.94 1852 accuracy 0.95 4209 macro avg 0.95 0.94 0.94 4209 weighted avg 0.95 0.95 0.95 4209 </pre>	89.3%	<p>confusion matrix for KNearest Neighbor</p> 