Project Development Phase
Model Performance Test

Date	8 November 2023
Team ID	Team-593136
Project Name	Car Purchase prediction
Maximum Marks	10 Marks

Model Performance Testing:

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

<table>
<tr><th>S.No.</th><th>Parameter</th><th>Values</th><th>Screenshot</th></tr>
<tr><td>1.</td><td>Metrics</td><td>Classification Model:
Confusion Matrix - ,
Accuray Score- &
Classification Report -</td><td>Accuracy Score<pre>
print("Train Set Accuracy:", train_accuracy)
print("Test Set Accuracy:", test_accuracy)

Train Set Accuracy: 0.9975
Test Set Accuracy: 0.94
</pre>Confusion matrix<pre>
from sklearn.metrics import confusion_matrix
pd.crosstab(y_test,y_pred)

    col_0   0   1
Purchased
    0   115   6
    1   6 73
</pre>Classification Report<pre>
# Display a classification report
print(classification_report(y_test, y_pred))

              precision   recall f1-score   support

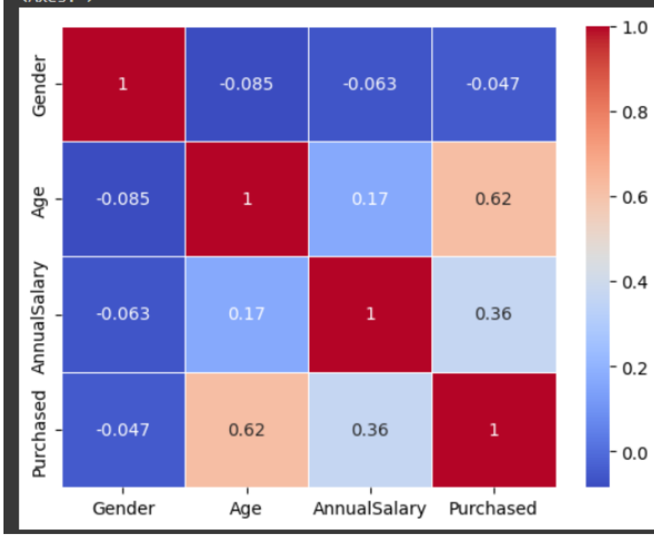
           0   0.95   0.95   0.95   121
           1   0.92   0.92   0.92   79

    accuracy   0.94   200
   macro avg   0.94   0.94   0.94   200
weighted avg   0.94   0.94   0.94   200
</pre></td></tr>
</table>

2.	Tune the Model	Feature Engineering: We have created a new feature “Age_Salary_Interact” as they have a positive interaction with the “Purchased” feature, that is, a positive correlation	

```
sns.heatmap(df.drop(columns=['User ID','Age_Less_Than_Avg','Salary_G
```

```
<Axes: >
```



Correlation of all variables with each other
(We can see Age and AnnualSalary have a positive correlation with purchased)

```
from sklearn.model_selection import train_test_split

# since age and annual salary show relatively high correlation to pu
df['Age_Salary_Interact'] = df['Age'] * df['AnnualSalary']

# Define the features and target variable
X = df[['Gender', 'Age', 'AnnualSalary', 'Age_Salary_Interact']]
y = df['Purchased']
```

We can see that Age_Salary_Interact is the product of age and AnnualSalary feature of the same observation

```
X.head()
```

	Gender	Age	AnnualSalary	Age_Salary_Interact
0	1	35	20000	700000
1	1	40	43500	1740000
2	1	49	74000	3626000
3	1	40	107500	4300000
4	1	25	79000	1975000