Project Development Phase
Model Performance Test

Date	19th November 2023
Team ID	Team-592083
Project Name	Project – Disease Prediction using Machine Learning
Maximum Marks	10 Marks

Model Performance Testing:

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

S.No.	Parameter	Values
1.	Matrics	**Model Type : Random Forest Classifier** **#Accuracy Score** The Testing Accuracy of the algorithm is 0.9523809523809523 **Model Type : KNN** **#Accuracy Score** The Testing Accuracy of the algorithm is 0.9523809523809523

#CONFUSION MATRIX

```
[81] confusion_matrix(y1_test, y_pred1)

array([[1, 0, 0, ..., 0, 0, 0],
       [0, 1, 0, ..., 0, 0, 0],
       [0, 1, 0, ..., 0, 0, 0],
       ...,
       [0, 0, 0, ..., 1, 0, 0],
       [0, 0, 0, ..., 0, 1, 0],
       [0, 0, 0, ..., 0, 0, 1]])
```

```
pd.crosstab(y1_test, y_pred1)
```

col_0	(vertigo) Paroymsal Positional Vertigo	AIDS	Arthritis	Bronchial Asthma	Cervical spondylosis	Chicken pox	Chronic cholestasis	Common Cold	Dengue	Diabetes	...	Osteoarthristis	h
prognosis													
(vertigo) Paroymsal Positional Vertigo	1	0	0	0	0	0	0	0	0	0	...	0	
AIDS	0	1	0	0	0	0	0	0	0	0	...	0	
Acne	0	1	0	0	0	0	0	0	0	0	...	0	
Alcoholic hepatitis	0	1	0	0	0	0	0	0	0	0	...	0	
Allergy	0	1	0	0	0	0	0	0	0	0	...	0	
Arthritis	0	0	1	0	0	0	0	0	0	0	...	0	
Bronchial Asthma	0	0	0	1	0	0	0	0	0	0	...	0	
Cervical													

GERD	0	0	0	0	0	0	0	0	0	0	...	0	0
Gastroenteritis	0	0	0	0	0	0	0	0	0	0	...	0	0
Heart attack	0	0	0	0	0	0	0	0	0	0	...	0	0
Hepatitis B	0	0	0	0	0	0	0	0	0	0	...	0	0
Hepatitis C	0	0	0	0	0	0	0	0	0	0	...	0	0
Hepatitis D	0	0	0	0	0	0	0	0	0	0	...	0	0
Hepatitis E	0	0	0	0	0	0	0	0	0	0	...	0	0
Hypertension	0	0	0	0	0	0	0	0	0	0	...	0	0
Hyperthyroidism	0	0	0	0	0	0	0	0	0	0	...	0	0
Hypoglycemia	0	0	0	0	0	0	0	0	0	0	...	0	0
Hypothyroidism	0	0	0	0	0	0	0	0	0	0	...	0	0
Impetigo	0	0	0	0	0	0	0	0	0	0	...	0	0
Jaundice	0	0	0	0	0	0	0	0	0	0	...	0	0
Malaria	0	0	0	0	0	0	0	0	0	0	...	0	0
Migraine	0	0	0	0	0	0	0	0	0	0	...	0	0
Osteoarthristis	0	0	0	0	0	0	0	0	0	0	...	1	0
Paralysis (brain hemorrhage)	0	0	0	0	0	0	0	0	0	0	...	0	1
Peptic ulcer diseae	0	0	0	0	0	0	0	0	0	0	...	0	0
Pneumonia	0	0	0	0	0	0	0	0	0	0	...	0	0
Psoriasis	0	0	0	0	0	0	0	0	0	0	...	0	0

#CLASSIFICATION REPORT

```
print(classification_report(y1_test,y_pred1))
```

```
                                    precision    recall  f1-score   support

    (vertigo) Paroymsal  Positional Vertigo       1.00      1.00      1.00         1
                                  AIDS       0.20      1.00      0.33         1
                                  Acne       0.00      0.00      0.00         1
                  Alcoholic hepatitis       0.00      0.00      0.00         1
                              Allergy       0.00      0.00      0.00         1
                            Arthritis       1.00      1.00      1.00         1
                       Bronchial Asthma       1.00      1.00      1.00         1
                   Cervical spondylosis       1.00      1.00      1.00         1
                            Chicken pox       1.00      1.00      1.00         1
                   Chronic cholestasis       1.00      1.00      1.00         1
                            Common Cold       1.00      1.00      1.00         1
                                 Dengue       1.00      1.00      1.00         1
                               Diabetes       1.00      1.00      1.00         1
            Dimorphic hemmorhoids(piles)       0.00      0.00      0.00         1
                          Drug Reaction       1.00      1.00      1.00         1
                      Fungal infection       1.00      1.00      1.00         2
                                  GERD       1.00      1.00      1.00         1
                        Gastroenteritis       1.00      1.00      1.00         1
                           Heart attack       1.00      1.00      1.00         1
                           Hepatitis B       1.00      1.00      1.00         1
                           Hepatitis C       0.50      1.00      0.67         1
                           Hepatitis D       0.00      0.00      0.00         1
                           Hepatitis E       1.00      1.00      1.00         1
                          Hypertension       1.00      1.00      1.00         1
                       Hyperthyroidism       1.00      1.00      1.00         1
                          Hypoglycemia       1.00      1.00      1.00         1
                       Hypothyroidism       1.00      1.00      1.00         1
                             Impetigo       1.00      1.00      1.00         1
                             Jaundice       1.00      1.00      1.00         1
                              Malaria       1.00      1.00      1.00         1
                             Migraine       1.00      1.00      1.00         1
                     Osteoarthristis       1.00      1.00      1.00         1
          Paralysis (brain hemorrhage)       1.00      1.00      1.00         1
                   Peptic ulcer diseae       1.00      1.00      1.00         1
                             Pneumonia       1.00      1.00      1.00         1
                             Psoriasis       1.00      1.00      1.00         1
                          Tuberculosis       1.00      1.00      1.00         1
                               Typhoid       1.00      1.00      1.00         1
               Urinary tract infection       0.50      1.00      0.67         1
                        Varicose veins       1.00      1.00      1.00         1
                           hepatitis A       1.00      1.00      1.00         1

                              accuracy                           0.95        42
                             macro avg       0.93      0.95      0.93        42
                          weighted avg       0.93      0.95      0.94        42

/usr/local/lib/python3.10/dist-packages/sklearn/metrics/_classification.py:1344: UndefinedMetr
  _warn_prf(average, modifier, msg_start, len(result))
/usr/local/lib/python3.10/dist-packages/sklearn/metrics/_classification.py:1344: UndefinedMetr
  _warn_prf(average, modifier, msg_start, len(result))
/usr/local/lib/python3.10/dist-packages/sklearn/metrics/_classification.py:1344: UndefinedMetr
  _warn_prf(average, modifier, msg_start, len(result))
```

For Random Forest Classifier

2.	Accuracy	Training Accuracy – 0.940 Validation Accuracy –0.927

```
y_pred = rfc_new.predict(X1_val)
yt_pred = rfc_new.predict(X1_train)
y_pred1 = rfc_new.predict(X1_test)
print('The Training Accuracy of the algorithm is ', accuracy_score(y1_train, yt_pred))
print('The Validation Accuracy of the algorithm is ', accuracy_score(y1_val, y_pred))
print('The Testing Accuracy of the algorithm is', accuracy_score(y1_test, y_pred1))
```

```
The Training Accuracy of the algorithm is  0.9402947154471545
The Validation Accuracy of the algorithm is  0.9278455284552846
The Testing Accuracy of the algorithm is 0.9523809523809523
```

```
[ ] randomf = pd.DataFrame(data = rfc_results,columns=['Number of features','Training Accuracy','Testing Accuracy'])
```

```
randomf
```

	Number of features	Training Accuracy	Testing Accuracy
0	3	0.099085	0.095238
1	9	0.248222	0.238095
2	17	0.435213	0.428571
3	24	0.579522	0.571429
4	33	0.718496	0.714286
5	53	0.936230	0.928571
6	63	0.965955	0.952381

For KNN

2.	Accuracy	Training Accuracy – 0.936 Validation Accuracy –0.935

```
y_pred = knn_new.predict(X1_val)
yt_pred = knn_new.predict(X1_train)
y_pred1 = knn_new.predict(X1_test)
print('The Training Accuracy of the algorithm is ', accuracy_score(y1_train, yt_pred))
print('The Validation Accuracy of the algorithm is ', accuracy_score(y1_val, y_pred))
print('The Testing Accuracy of the algorithm is', accuracy_score(y1_test, y_pred1))
```

```
The Training Accuracy of the algorithm is  0.9367378048780488
The Validation Accuracy of the algorithm is  0.9359756097560976
The Testing Accuracy of the algorithm is 0.9523809523809523
```

```
knn_table = pd.DataFrame(data = knn_results,columns=['Number of features','Training Accuracy','Testing Accuracy'])
```

```
knn_table
```

	Number of features	Training Accuracy	Testing Accuracy
0	3	0.098069	0.095238
1	9	0.244411	0.238095
2	17	0.427846	0.428571
3	24	0.576220	0.571429
4	33	0.716717	0.714286
5	53	0.935976	0.952381
6	63	0.964685	0.952381

```
#comparing our predicted results with the actual values.
test.join(pd.DataFrame(y_pred1,columns=["predicted"]))[["prognosis","predicted"]]
```

	prognosis	predicted
0	Fungal infection	Fungal infection
1	Allergy	Allergy
2	GERD	GERD
3	Chronic cholestasis	Chronic cholestasis
4	Drug Reaction	Fungal infection
5	Peptic ulcer diseae	Peptic ulcer diseae
6	AIDS	AIDS
7	Diabetes	Diabetes
8	Gastroenteritis	Gastroenteritis
9	Bronchial Asthma	Bronchial Asthma
10	Hypertension	Hypertension
11	Migraine	Migraine
12	Cervical spondylosis	Cervical spondylosis
13	Paralysis (brain hemorrhage)	Paralysis (brain hemorrhage)
14	Jaundice	Jaundice
15	Malaria	Malaria
16	Chicken pox	Chicken pox