

Model Development Phase Template

Date	10 July 2024
Team ID	740021
Project Title	Sepsis Survival Minimal Clinical Records
Maximum Marks	4 Marks

Initial Model Training Code, Model Validation and Evaluation Report

This 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

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```
In [ ]: y_train_pred = log.predict(x_train)
        y_test_pred = log.predict(x_test)
```

```
In [ ]: from sklearn.metrics import accuracy_score
        from sklearn.metrics import precision_score
        from sklearn.metrics import recall_score
        from sklearn.metrics import f1_score
```

```
In [ ]: train_accuracy = accuracy_score(y_train, y_train_pred)
```

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etricWarning: Precision is ill-defined and being set to 0.0 in labels with no predicted samples. Use 'zero_division' parameter to control this behavior.
_warn_prf(average, modifier, msg_start, len(result))

```
In [ ]: test_accuracy = accuracy_score(y_test, y_test_pred)
        test_precision = precision_score(y_test, y_test_pred, average='weighted')
        test_recall = recall_score(y_test, y_test_pred, average='weighted')
        test_f1score = f1_score(y_test, y_test_pred, average='weighted')
```

/usr/local/lib/python3.10/dist-packages/sklearn/metrics/_classification.py:1344: UndefinedMetricWarning: Precision is ill-defined and being set to 0.0 in labels with no predicted samples. Use 'zero_division' parameter to control this behavior.
_warn_prf(average, modifier, msg_start, len(result))

```
In [ ]: print("log train accuracy:", train_accuracy)
        print("log test accuracy:", test_accuracy)
        print("log train precision:", train_precision)
        print("log test precision:", test_precision)
        print("log train recall:", train_recall)
        print("log test recall:", test_recall)
        print("log train f1score:", train_f1score)
        print("log test f1score:", test_f1score)
```

```
In [ ]: #checking the accuracy of the model using KNN classifier
        from sklearn.neighbors import KNeighborsClassifier
        knn = KNeighborsClassifier(n_neighbors=5, p=2)
```

```
In [ ]: knn.fit(x_train, y_train)
```

```
Out[ ]: KNeighborsClassifier()
```

In a Jupyter environment, please rerun this cell to show the HTML representation or trust the notebook.

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```
In [ ]: train_accuracy = accuracy_score(y_train, y_train_pred)
        train_precision = precision_score(y_train, y_train_pred, average='weighted')
        train_recall = recall_score(y_train, y_train_pred, average='weighted')
        train_f1score = f1_score(y_train, y_train_pred, average='weighted')
```

```
In [ ]: test_accuracy = accuracy_score(y_test, y_test_pred)
        test_precision = precision_score(y_test, y_test_pred, average='weighted')
        test_recall = recall_score(y_test, y_test_pred, average='weighted')
        test_f1score = f1_score(y_test, y_test_pred, average='weighted')
```

```
In [ ]: print("knn train accuracy:", train_accuracy)
        print("knn test accuracy:", test_accuracy)
        print("knn train precision:", train_precision)
        print("knn test precision:", test_precision)
        print("knn train recall:", train_recall)
        print("knn test recall:", test_recall)
        print("knn train f1score:", train_f1score)
        print("knn test f1score:", test_f1score)
```

```
In [ ]: #checking the accuracy of the model using decision tree classifier
from sklearn.tree import DecisionTreeClassifier
dt = DecisionTreeClassifier(criterion='entropy',max_depth=3)
```

```
In [ ]: dt.fit(x_train,y_train)
```

```
Out[ ]: DecisionTreeClassifier(criterion='entropy', max_depth=3)
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On GitHub, the HTML representation is unable to render, please try loading this page with nbviewer.org.
```

```
In [ ]: y_train_pred = dt.predict(x_train)
y_test_pred = dt.predict(x_test)
```

```
In [ ]: train_accuracy = accuracy_score(y_train,y_train_pred)
train_precision = precision_score(y_train,y_train_pred,average='weighted')
```

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```
In [ ]: test_accuracy = accuracy_score(y_test,y_test_pred)
test_precision = precision_score(y_test,y_test_pred,average='weighted')
test_recall = recall_score(y_test,y_test_pred,average='weighted')
test_fscore = f1_score(y_test,y_test_pred,average='weighted')

/usr/local/lib/python3.10/dist-packages/sklearn/metrics/_classification.py:1344: UndefinedMetricWarning: Precision is ill-defined and being set to 0.0 in labels with no predicted samples. Use 'zero_division' parameter to control this behavior.
warn_prf(average, modifier, msg_start, len(result))

In [ ]: print("dt train accuracy:",train_accuracy)
print("dt test accuracy:",test_accuracy)
print("dt train precision:",train_precision)
print("dt test precision:",test_precision)
print("dt train recall:",train_recall)
print("dt test recall:",test_recall)
print("dt train fscore:",train_fscore)
print("dt test fscore:",test_fscore)
```

```

In [ ]: #checking accuracy using randomforest classifier
from sklearn.ensemble import RandomForestClassifier
rf= RandomForestClassifier(n_estimators=2,max_depth=2,criterion='entropy',bootstrap= T

In [ ]: rf.fit(x_train,y_train)

Out[ ]: RandomForestClassifier(criterion='entropy', max_depth=2, n_estimators=2)
In a Jupyter environment, please rerun this cell to show the HTML representation or trust the
notebook.
On GitHub, the HTML representation is unable to render, please try loading this page with
nbviewer.org.

In [ ]: y_train_pred = rf.predict(x_train)
y_test_pred = rf.predict(x_test)

In [ ]: train_accuracy = accuracy_score(y_train,y_train_pred)
train_precision = precision_score(y_train,y_train_pred,average='weighted')
train_recall = recall_score(y_train,y_train_pred,average='weighted')
train_fscore = f1_score(y_train,y_train_pred,average='weighted')

/usr/local/lib/python3.10/dist-packages/sklearn/metrics/_classification.py:1344: Undefined
etricWarning: Precision is ill-defined and being set to 0.0 in labels with no predicted
ples. Use 'zero_division' parameter to control this behavior.
_warn_prf(average, modifier, msg_start, len(result))

In [ ]: test_accuracy = accuracy_score(y_test,y_test_pred)
test_precision = precision_score(y_test,y_test_pred,average='weighted')
test_recall = recall_score(y_test,y_test_pred,average='weighted')

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warn_prf(average, modifier, msg_start, len(result))

In [ ]: print("rf train accuracy:",train_accuracy)
print("rf test accuracy:",test_accuracy)
print("rf train precision:",train_precision)
print("rf test precision:",test_precision)
print("rf train recall:",train_recall)
print("rf test recall:",test_recall)
print("rf train fscore:",train_fscore)
print("rf test fscore:",test_fscore)

```



Model Valuation And Evalution Report

Model	Classification Report	F1 Score
KNN	<pre> knn train accuracy: 0.9126849117458935 knn test accuracy: 0.9129812796494459 knn train precision: 0.8615128571673442 knn test precision: 0.8634128153243682 knn train recall: 0.9126849117458935 knn test recall: 0.9129812796494459 </pre>	88%
Random Forest	<pre> rf train accuracy: 0.9232590737741729 rf test accuracy: 0.9226494776617826 rf train precision: 0.8524873173863437 rf test precision: 0.8512828586204125 rf train recall: 0.9232590737741729 rf test recall: 0.9226494776617826 </pre>	89%

Decision Tree	dt train accuracy: 0.9232590737741729 dt test accuracy: 0.9226494776617026 dt train precision: 0.8524073173063437 dt test precision: 0.8512020506204125 dt train recall: 0.9232590737741729 dt test recall: 0.9226494776617026	89%
Logistic Regression	log train accuracy: 0.9232590737741729 log test accuracy: 0.9226494776617026 log train precision: 0.8524073173063437 log test precision: 0.8512020506204125 log train recall: 0.9232590737741729 log test recall: 0.9226494776617026	89%