

Model Development Phase Template

Date	8 July 2024
Team ID	739902
Project Title	FetalAI: Using Machine Learning To Predict And Monitor Fetal Health
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:

Random Forest:

Model Building

✓ Random Forest

```
[ ] Rf_model = RandomForestClassifier()  
    Rf_model.fit(x_train_smote, y_train_smote)  
    Rf_model_pred = Rf_model.predict(x_test)  
    print(accuracy_score(y_test, Rf_model_pred))
```

⇒ 0.9435736677115988

Decision Tree:

▼ Decision Tree

```
[ ] DT_model = DecisionTreeClassifier()  
    DT_model.fit(x_train_smote, y_train_smote)  
    DT_model_pred = DT_model.predict(x_test)  
    print(accuracy_score(y_test, DT_model_pred))
```

⇒ 0.9216300940438872

Logistic Regression:

▼ Logistic Regression

```
[ ] LR_model = LogisticRegression()  
    LR_model.fit(x_train_smote, y_train_smote)  
    LR_model_pred = LR_model.predict(x_test)  
    print(accuracy_score(y_test, LR_model_pred))
```

⇒ 0.8605015673981191

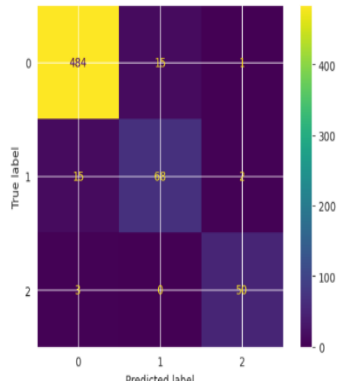
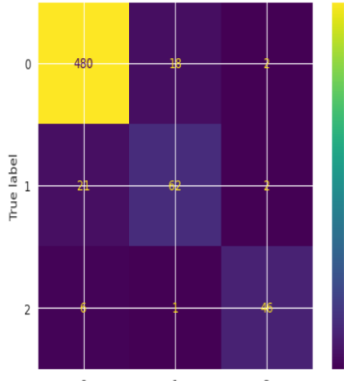
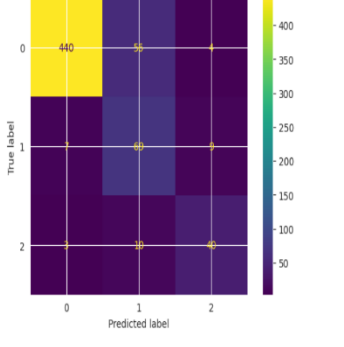
K- Nearest Neighbors:

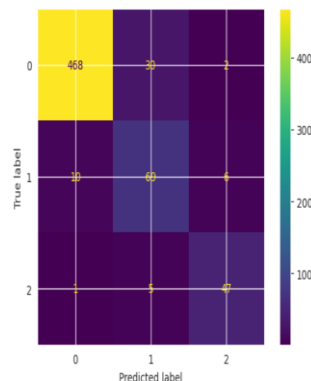
▼ K-Nearest Neighbors

```
▶ KNN_model = KNeighborsClassifier()  
    KNN_model.fit(x_train_smote, y_train_smote)  
    KNN_model_pred = KNN_model.predict(x_test)  
    print(accuracy_score(y_test, KNN_model_pred))
```

⇒ 0.9153605015673981

Model Validation and Evaluation Report:

Model	Classification Report	Accuracy	Confusion Matrix
Random Forest	<p>Model Building</p> <p>▼ Random Forest</p> <pre>[] RF_model = RandomForestClassifier() RF_model.fit(x_train_smote, y_train_smote) RF_model_pred = RF_model.predict(x_test) print(accuracy_score(y_test, RF_model_pred))</pre> <p>0.9435736677115988</p>	94%	<pre>cm = confusion_matrix(y_test, RF_model_pred) disp = ConfusionMatrixDisplay(confusion_matrix=cm) disp.plot()</pre> <p><sklearn.metrics._plot.confusion_matrix.ConfusionMatrixDisplay at 0x7899dc8dd660></p> 
Decision Tree	<p>▼ Decision Tree</p> <pre>[] DT_model = DecisionTreeClassifier() DT_model.fit(x_train_smote, y_train_smote) DT_model_pred = DT_model.predict(x_test) print(accuracy_score(y_test, DT_model_pred))</pre> <p>0.9216300940438872</p>	92%	<pre>cm = confusion_matrix(y_test, DT_model_pred) disp = ConfusionMatrixDisplay(confusion_matrix=cm) disp.plot()</pre> <p><sklearn.metrics._plot.confusion_matrix.ConfusionMatrixDisplay at 0x7899dc8d></p> 
Logistic Regression	<p>▼ Logistic Regression</p> <pre>[] LR_model = LogisticRegression() LR_model.fit(x_train_smote, y_train_smote) LR_model_pred = LR_model.predict(x_test) print(accuracy_score(y_test, LR_model_pred))</pre> <p>0.8605015673981191</p>	86%	<pre>cm = confusion_matrix(y_test, LR_model_pred) disp = ConfusionMatrixDisplay(confusion_matrix=cm) disp.plot()</pre> <p><sklearn.metrics._plot.confusion_matrix.ConfusionMatrixDisplay at 0x7899dcea020></p> 

<p>K - Nearest Neighbors</p>	<p>▼ K-Nearest Neighbors</p> <pre> KNN_model = KNeighborsClassifier() KNN_model.fit(x_train_smote, y_train_smote) KNN_model_pred = KNN_model.predict(x_test) print(accuracy_score(y_test, KNN_model_pred)) </pre> <p>0.9153605015673981</p>	<p>91.5%</p>	<pre> cm = confusion_matrix(y_test, KNN_model_pred) disp = ConfusionMatrixDisplay(confusion_matrix=cm) disp.plot() </pre> <p>sklearn.metrics._plot.confusion_matrix.ConfusionMatrixDisplay at 0x7899dcf02ddb</p>  <table border="1"> <thead> <tr> <th>True label \ Predicted label</th> <th>0</th> <th>1</th> <th>2</th> </tr> </thead> <tbody> <tr> <th>0</th> <td>468</td> <td>1</td> <td>1</td> </tr> <tr> <th>1</th> <td>1</td> <td>1</td> <td>1</td> </tr> <tr> <th>2</th> <td>1</td> <td>1</td> <td>1</td> </tr> </tbody> </table>	True label \ Predicted label	0	1	2	0	468	1	1	1	1	1	1	2	1	1	1
True label \ Predicted label	0	1	2																
0	468	1	1																
1	1	1	1																
2	1	1	1																