ModelDevelopmentPhaseTemplate

Date	June
TeamID	LTVIP2025TMID35140
Project Title	Revolutionizing Liver Care: Predicting Liver CirrhosisUsingAdvancedMachineLearning Techniques.
Maximum Marks	4 Marks

InitialModelTrainingCode,ModelValidationandEvaluationReport

TheinitialmodeltrainingcodewillbeshowcasedinthefuturethroughascreenshotThemodel validation and evaluation report will include classification reports, accuracy, and confusion matrices for multiple models, presented through respective screenshots.

InitialModelTrainingCode:

NAIVE BAYES

```
from sklearn.naive_bayes import GaussianNB

nb = GaussianNB()
nb.fit(X_train, y_train)
```
.52]
·· GaussianNB()

RANDOM FOREST

```
from sklearn.ensemble import RandomForestClassifier

rf = RandomForestClassifier()
rf.fit(X_train, y_train)
```
.53]
·· RandomForestClassifier()

LOGISTIC REGRESSION CV

```
from sklearn.linear_model import LogisticRegressionCV

# Logistic Regression CV
lcv = LogisticRegressionCV(cv=5)
lcv.fit(X_train, y_train)
```
.54]
·· LogisticRegressionCV(cv=5)

RIDGE CLASSIFIER

```
from sklearn.linear_model import RidgeClassifier

# Ridge Classifier
rg = RidgeClassifier()
rg.fit(X_train, y_train)
```
[155]
··· RidgeClassifier()

SUPPORT VECTOR CLASSIFIER [SVC]

```
from sklearn.svm import SVC

# Support Vector Classifier (SVC)
svc = SVC()
svc.fit(X_train, y_train)
```
[156]
··· SVC()

LOGISTIC REGRESSION

```
from sklearn.linear_model import LogisticRegression

log = LogisticRegression()
logistic = log.fit(X_train, y_train)
```
[157]

KNN

```python
from sklearn.neighbors import KNeighborsClassifier

knn = KNeighborsClassifier()
knn.fit(X_train, y_train)
```

[162]

··· KNeighborsClassifier()

XGBOOST

```python
from xgboost import XGBClassifier
model=XGBClassifier()
model.fit(X,y)
```

9]

```
XGBClassifier(base_score=None, booster=None, callbacks=None,
              colsample_bylevel=None, colsample_bynode=None,
              colsample_bytree=None, device=None, early_stopping_rounds=None,
              enable_categorical=False, eval_metric=None, feature_types=None,
              gamma=None, grow_policy=None, importance_type=None,
              interaction_constraints=None, learning_rate=None, max_bin=None,
              max_cat_threshold=None, max_cat_to_onehot=None,
              max_delta_step=None, max_depth=None, max_leaves=None,
              min_child_weight=None, missing=nan, monotone_constraints=None,
              multi_strategy=None, n_estimators=None, n_jobs=None,
              num_parallel_tree=None, random_state=None, ...)
```

ModelValidationandEvaluationReport:

Model	Classification Report	Accuracy	Confusion Matrix
Naive Bayes	Classification Report (Naive bayes): <pre> precision recall f1-score support 0 0.68 0.72 0.70 68 1 0.84 0.81 0.82 122 accuracy 0.78 190 macro avg 0.76 0.77 0.76 190 weighted avg 0.78 0.78 0.78 190</pre>	35.79 %	Confusion Matrix (Naive bayes): [[49 19] [23 99]]
Random Forest	Classification Report (Random Forest): <pre> precision recall f1-score support 0 0.84 0.71 0.77 68 1 0.85 0.93 0.89 122 accuracy 0.85 190 macro avg 0.85 0.82 0.83 190 weighted avg 0.85 0.85 0.84 190</pre>	73.16 %	Confusion Matrix (Random Forest): [[48 20] [9 113]]
Logistic Regression CV	Classification Report (Logistic Regression CV): <pre> precision recall f1-score support 0 0.81 0.63 0.71 68 1 0.82 0.92 0.86 122 accuracy 0.82 190 macro avg 0.81 0.78 0.79 190 weighted avg 0.82 0.82 0.81 190</pre>	73.16 %	Confusion Matrix (Logistic Regression CV): [[43 25] [10 112]]

Ridge Classifier	Classification Report (Ridge Classifier):
	        precision recall f1-score support
	
	      0 0.85 0.68 0.75 68
	      1 0.84 0.93 0.88 122
	
	  accuracy 0.84 190
	 macro avg 0.85 0.81 0.82 190
	weighted avg 0.84 0.84 0.84 190
		35.79 %	Confusion Matrix (Ridge Classifier):
			[[46 22]
			 [8 114]]

Support Vector Classifier	Classification Report (Support Vector Classifier):
	        precision recall f1-score support
	
	      0 0.50 0.09 0.15 68
	      1 0.65 0.95 0.77 122
	
	  accuracy 0.64 190
	 macro avg 0.58 0.52 0.46 190
	weighted avg 0.60 0.64 0.55 190
		35.79 %	Confusion Matrix (Support Vector Classifier):
			[[6 62]
			 [6 116]]

Logistic Regression	Classification Report (Logistic Regression):
	        precision recall f1-score support
	
	      0 0.80 0.57 0.67 68
	      1 0.79 0.92 0.85 122
	
	  accuracy 0.79 190
	 macro avg 0.80 0.75 0.76 190
	weighted avg 0.79 0.79 0.79 190
		74.21 %	Confusion Matrix (Logistic Regression):
			[[39 29]
			 [10 112]]

KNN	[7 115]]
	Classification Report (KNN):
	        precision recall f1-score support
	
	      0 0.88 0.72 0.79 68
	      1 0.86 0.94 0.90 122
	
	  accuracy 0.86 190
	 macro avg 0.87 0.83 0.84 190
	weighted avg 0.86 0.86 0.86 190
		86.32 %	Confusion Matrix (KNN):
			[[49 19]
			 [7 115]]

XG Boost	Classification Report (XGBoost):
	        precision recall f1-score support
	
	      0 0.83 0.71 0.76 68
	      1 0.85 0.92 0.88 122
	
	  accuracy 0.84 190
	 macro avg 0.84 0.81 0.82 190
	weighted avg 0.84 0.84 0.84 190
		64.21 %	Confusion Matrix (XGBoost):
			[[48 20]
			 [10 112]]