Model Development Phase

Date	15 July 2024
Team ID	740091
Project Title	Thyroid Classification using ML
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:

```python
from sklearn.ensemble import RandomForestClassifier
from sklearn.metrics import accuracy_score,confusion_matrix,classification_report
from sklearn.model_selection import GridSearchCV

rf = RandomForestClassifier(random_state=42, bootstrap=False, max_depth=None,
                            max_features='sqrt', min_samples_leaf=2,
                            min_samples_split=2, n_estimators=100)
rf.fit(x_train,y_train)
```

```
▼                    RandomForestClassifier
RandomForestClassifier(bootstrap=False, min_samples_leaf=2, random_state=42)
```

```python
x_pred=rf.predict(x_train)
y_pred=rf.predict(x_test)
```

Model Validation and Evaluation Report:

Model	Classification Report	Accuracy	Confusion Matrix
| Random forest Classifier | ```
print(classification_report(y_test,y_pred))

                        precision    recall  f1-score   support

compensated hypothyroid      0.84      0.88      0.86        24
               negative      1.00      1.00      1.00       893

               accuracy                          0.99       917
              macro avg      0.92      0.94      0.93       917
           weighted avg      0.99      0.99      0.99       917
``` | 99.86% | ```
confusionMatrix = confusion_matrix(y_train,x_pred)
print("Confusion Matrix:",confusionMatrix)

Confusion Matrix: [[3534    0]
 [  10 3524]]
``` |