Model Development Phase Template

Date	15 March 2024
Team ID	SWTID1720014456
Project Title	Thyroid Classification
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:

```
# Separate features and target variable
X = data.drop(columns=['target'])
y = data['target']

# Encode the target variable
label_encoder = LabelEncoder()
y = label_encoder.fit_transform(y)

# Split the dataset into training and testing sets
X_train, X_test, y_train, y_test = train_test_split(X, y, test_size=0.2, random_state=42)

# Train a Random Forest model
rf_model = RandomForestClassifier(n_estimators=100, random_state=42)
rf_model.fit(X_train, y_train)

# Make predictions
y_pred = rf_model.predict(X_test)

# Evaluate the model
accuracy = accuracy_score(y_test, y_pred)
```

Model Validation and Evaluation Report:

Model	Classification Report	Accuracy	Confusion Matrix
Random Forest	Accuracy: 0.9307901907356948 Classification Report: precision recall f1-score support - 0.95 0.97 0.96 1328 A 0.63 0.81 0.71 21 AK 0.80 0.80 0.80 10 B 0.00 0.00 0.00 4 F 0.93 0.93 0.93 40 FK 0.00 0.00 0.00 1 G 0.95 1.00 0.97 69 GI 0.00 0.00 0.00 1 GK 0.86 1.00 0.92 6 I 0.85 0.71 0.77 82 J 1.00 0.25 0.40 12 K 0.87 0.92 0.89 106 KJ 1.00 0.50 0.67 2 L 0.67 0.50 0.57 28 M 1.00 1.00 1.00 25 MK 1.00 1.00 1.00 6 N 0.71 0.85 0.77 20 O 0.67 0.50 0.57 4 Q 1.00 0.67 0.80 3 R 0.89 0.71 0.79 45 S 0.96 1.00 0.98 22 accuracy 0.93 1835 macro avg 0.75 0.67 0.69 1835 weighted avg 0.93 0.93 0.93 1835	0.9307901907356948	conf_matrix = confusion_matrix(y_test, y_pred) print('Confusion Matrix:') print(conf_matrix) Confusion Matrix: [[1291 4 2 0 1 0 2 0 0 9 0 11 0 5 0 0 0 1 0 1 1] [4 17 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0] [0 0 8 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 2 0] [4 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0] [0 0 0 0 37 0 2 0 1 0 0 0 0 0 0 0 0 0 0 0 0] [0 0 0 0 1 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0] [0 0 0 0 0 0 69 0 0 0 0 0 0 0 0 0 0 0 0 0 0] [1 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0] [0 0 0 0 0 0 0 0 6 0 0 0 0 0 0 0 0 0 0 0 0] [21 2 0 0 0 0 0 0 0 58 0 0 0 0 0 0 1 0 0 0 0] [7 0 0 0 0 0 0 0 0 0 3 2 0 0 0 0 0 0 0 0 0] [8 0 0 0 0 0 0 0 0 0 0 98 0 0 0 0 0 0 0 0 0] [1 0 0 0 0 0 0 0 0 0 0 0 1 0 0 0 0 0 0 0 0] [5 1 0 0 0 0 0 0 0 1 0 0 0 14 0 0 6 0 0 1 0] [0 0 0 0 0 0 0 0 0 0 0 0 0 0 25 0 0 0 0 0 0] [0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 6 0 0 0 0 0] [0 1 0 0 0 0 0 0 0 0 0 0 0 2 0 0 17 0 0 0 0] [1 0 0 0 1 0 0 0 0 0 0 0 0 0 0 0 0 2 0 0 0] [0 0 0 0 0 0 0 0 0 0 0 0 1 0 0 0 0 0 2 0 0] [10 2 0 0 0 0 0 0 0 0 0 1 0 0 0 0 0 0 0 32 0] [0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 22]]