

## 4.1 Model Development Phase Template

Date	11 July 2024
Team ID	SWTID1720099206
Project Title	Anemia Sense: Leveraging Machine Learning For Precise Anemia Recognitions
Maximum Marks	5 Marks

### Feature Selection Report Template

In the forthcoming update, each feature will be accompanied by a brief description. Users will indicate whether it's selected or not, providing reasoning for their decision. This process will streamline decision-making and enhance transparency in feature selection.

Feature	Description	Selected (Yes/No)	Reasoning
Mean Corpuscular Volume (MCV)	The average volume of a red blood cell, measured in femtoliters (fL). This helps classify the type of anemia	Yes	MCV measures the average volume of red blood cells and is a critical parameter for classifying anemia types.
Mean Corpuscular Hemoglobin (MCH)	The average amount of hemoglobin per red blood cell, measured in picograms (pg). It helps in	Yes	MCH measures the average amount of hemoglobin per red blood cell and helps determine the hemoglobin content within each cell.

	understanding the hemoglobin content per cell.		
Mean Corpuscular Hemoglobin Concentration	The average concentration of hemoglobin in a given volume of packed red blood cells, measured in grams per deciliter (g/dL). It indicates the hemoglobin concentration within red blood cells.	Yes	MCHC measures the average concentration of hemoglobin in a given volume of packed red blood cells, providing insight into the hemoglobin saturation within cells.

## 4.2 Model Development Phase Template

Date	15 March 2024
Team ID	XXXXXX
Project Title	XXXXXX
Maximum Marks	6 Marks

### Model Selection Report

In the forthcoming Model Selection Report, various models will be outlined, detailing their descriptions, hyperparameters, and performance metrics, including Accuracy or F1 Score. This comprehensive report will provide insights into the chosen models and their effectiveness.

### Model Selection Report:

Model	Description	Hyperparameters	Performance Metric (e.g., Accuracy, F1 Score)
Model 1: Random Forest Classifier	Random Forest is an ensemble learning method that operates by constructing multiple decision trees during training and outputs the class that is the mode of the classes (classification) or mean prediction (regression) of the individual trees	<ul style="list-style-type: none"> <li>n_estimators</li> <li>max_depth</li> </ul>	<ul style="list-style-type: none"> <li><b>Accuracy:</b> Overall accuracy of predictions.</li> <li><b>Precision:</b> Measures the proportion of true positive predictions out of all positive predictions.</li> <li><b>F1 Score:</b> Harmonic mean of precision and recall, balancing both metrics.</li> </ul>

Model 2: Decision Tree Model	A Decision Tree is a supervised learning algorithm used for both classification and regression tasks. It splits the data into subsets based on the most significant attribute, creating a tree structure	<ul style="list-style-type: none"> <li>• Criterion</li> <li>• splitter</li> </ul>	<ul style="list-style-type: none"> <li>• <b>Accuracy:</b> Overall accuracy of predictions.</li> <li>• <b>Precision:</b> Measures the proportion of true positive predictions out of all positive predictions.</li> <li>• <b>F1 Score:</b> Harmonic mean of precision and recall, balancing both metrics.</li> </ul>
<b>Model 3:</b> Guassian Naive Bayes	Gaussian Naive Bayes is a variant of the Naive Bayes algorithm that assumes the features follow a normal (Gaussian) distribution.	<ul style="list-style-type: none"> <li>• var_smoothing</li> </ul>	<ul style="list-style-type: none"> <li>• <b>Accuracy:</b> The proportion of correctly predicted instances out of the total instances.</li> <li>• <b>Precision:</b> The proportion of true positive predictions out of all positive predictions.</li> <li>• <b>F1 Score:</b> The harmonic mean of precision and recall, providing a balance between the two</li> </ul>

### 4.3 Model Development Phase Template

Date	11 July 2024
Team ID	SWTID1720099206
Project Title	Anemia Sense: Leveraging Machine Learning for Precise Anemia Recognitions
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:

Paste the screenshot of the model training code

#### Model Validation and Evaluation Report:

Model	Classification Report	Accuracy	Confusion Matrix
Model 1	<pre> Classification Report:       precision    recall  f1-score   support       0       1.00      1.00      1.00      128      1       1.00      1.00      1.00      120   accuracy:      1.00      1.00      1.00      248  macro avg:      1.00      1.00      1.00      248  weighted avg:      1.00      1.00      1.00      248           </pre>	Accuracy Value : 1.0	<p>Screenshot of the confusion matrix:</p> <pre> Confusion Matrix: [[128  0]  [ 0 120]]           </pre>
Model 2	<pre> Classification Report:       precision    recall  f1-score   support       0       1.00      1.00      1.00      128      1       1.00      1.00      1.00      120   accuracy:      1.00      1.00      1.00      248  macro avg:      1.00      1.00      1.00      248  weighted avg:      1.00      1.00      1.00      248           </pre>	Accuracy Value : 1.0	<p>Screenshot of the confusion matrix :</p> <pre> Confusion Matrix: [[128  0]  [ 0 120]]           </pre>

Model 3	<pre> Classification Report:       precision    recall  f1-score   support       0       0.99      0.95      0.97       128      1       0.95      0.99      0.97       120   accuracy          0.97       0.97       0.97       248  macro avg          0.97       0.97       0.97       248  weighted avg          0.97       0.97       0.97       248 </pre>	<p>Accuracy Value: 0.97 1774</p>	<p>Screenshot of confusion matrix:</p> <p>Confusion Matrix:</p> <pre> [[122   6]  [   1 119]] </pre>
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