**Model Development Phase Template**

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| Date | 19 June 2025 |
| Team ID | SWTID1749712812 |
| Project Title | Unlocking Silent Signals: Decoding Body Language with Mediapipe |
| Maximum Marks | 6 Marks |

**Model Selection Report:**

In this project, multiple machine learning models were implemented to classify body language gestures based on landmark data extracted using Mediapipe. The models were evaluated using **accuracy** as the primary metric. The following table provides a comparative analysis.

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| **Model** | **Description** | **Hyperparameters** | **Performance**  **Metric (e.g.,**  **Accuracy, F1**  **Score)** |
| Random  Forest | Ensemble of decision trees; handles complex body language patterns; resistant to overfitting; interpretable. | n\_estimators=100 | Accuracy score =  85% |
| Decision  Tree | Simple and interpretable; captures basic gesture logic, useful for fast testing and smaller datasets. | max\_depth=5 | Accuracy score =  81% |
| KNN | Classifies based on nearby pose vectors; effective for small datasets but sensitive to noise and scale. | n\_neighbors=5 | Accuracy score =  70% |

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| Gradient  Boosting | Boosted decision trees; strong generalization; better separation in confusing gesture zones (e.g., Angry vs. Victory). | learning\_rate=0.1 | Accuracy score =  83% |

