**Logistic Regression**

Best Parameters: {'C': 100, 'max\_iter': 100, 'penalty': 'l1', 'solver': 'liblinear'}

Classification Report:

precision recall f1-score support

0 0.96 0.97 0.97 1224

1 0.72 0.64 0.68 135

accuracy 0.94 1359

macro avg 0.84 0.81 0.82 1359

weighted avg 0.94 0.94 0.94 1359

Confusion Matrix:

[[1191 33]

[ 48 87]]

Accuracy: 0.9403973509933775

**Decision Tree**

Best Parameters: {'max\_depth': 3, 'min\_samples\_leaf': 1, 'min\_samples\_split': 2}

Classification Report (Best Model):

precision recall f1-score support

0 0.97 0.97 0.97 1224

1 0.72 0.72 0.72 135

accuracy 0.94 1359

macro avg 0.84 0.84 0.84 1359

weighted avg 0.94 0.94 0.94 1359

Confusion Matrix (Best Model):

[[1186 38]

[ 38 97]]

Accuracy (Best Model): 0.9440765268579838

**Random Forest**

Best Parameters: {'max\_depth': 15, 'min\_samples\_leaf': 2, 'min\_samples\_split': 10, 'n\_estimators': 100}

Classification Report (Best Model):

precision recall f1-score support

0 0.97 0.97 0.97 1224

1 0.73 0.69 0.71 135

accuracy 0.94 1359

macro avg 0.85 0.83 0.84 1359

weighted avg 0.94 0.94 0.94 1359

Confusion Matrix (Best Model):

[[1190 34]

[ 42 93]]

Accuracy (Best Model): 0.9440765268579838

Based on the output of the 3 models, Logistic Regression, Decision Tree and Random forest, we have accuracy, precision, recall and F1-score to determine the performance and compare the three models. All three models have overall high accuracy, Decision Tree and Random Forest slightly outperforming Logistic Regression. However, in medical diagnostic dataset context, it is crucial to look at other performance metrics to have comprehensive assessment to decide which is most suitable.

For medical diagnostic dataset, recall metric is more crucial compared to precision because it is important to correctly identify many true cases as possible, less false negatives. From the results, Decision Tree model show a balanced precision and recall for predicting diabetes, both at 0.72. Random Forest has slightly higher precision but lower recall compared to Decision Tree. On the other hand, Logistic Regression has lower recall which means it might miss the true cases of diabetes compared to the other two models.

F1 score in the modelling is the harmonic mean of precision and recall. Decision Tree has highest F1 score, suggesting a better balance between precision and recall. F1 score of Logistic Regression and Random Forest are similar but slightly lower than that of Decision Tree.

In summary, with the model results and interpretability of the three models, Decision Tree is preferred due to its straightforward nature and balanced metric performance. If the business requirement is to prioritize precision, random forest is a better choice with the cost of being slightly more complex.