**Project Development Phase**
**Model Performance Test**

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| Date | 19 July 2025 |
| Team ID | LTVIP2025TMID41526 |
| Project Name | Revolutionizing Liver Care: Predicting Liver Cirrhosis Using Advanced Machine Learning Techniques. |
| Maximum Marks | 10 Marks |

**Model Performance Testing:**

Model performance testing :

| S.No. | Parameter | Values | Screenshot |
|---|---|---|---|
| 1. | Metrics | **Classification Model:**<br>**Confusion Matrix:** [[51 17], [7 115]]<br>**Accuracy Score:** 87.36%<br>**Classification Report:**<br>Class 0 → Precision: 88%, Recall: 75%, F1: 81%<br>Class 1 → Precision: 87%, Recall: 94%, F1: 91%<br>Overall Accuracy: **87.36%** | Train score with tuned model: 0.8985507246376812<br>Test score with tuned model: 0.8421052631578947<br>Optimal hyperparameters for KNN: {'n_neighbors': np.int64(12)}<br>Accuracy on test set: 0.84<br>Confusion Matrix (KNN):<br>[[ 51 17]<br>[ 13 109]]<br>Classification Report (KNN):<br>precision recall f1-score support<br>0 0.80 0.75 0.77 68<br>1 0.87 0.89 0.88 122<br>accuracy 0.84 190<br>macro avg 0.83 0.82 0.83 190<br>weighted avg 0.84 0.84 0.84 190 |
| 2. | Tune the Model | **Hyperparameter Tuning:** Done using RandomizedSearchCV for KNN<br>**Best parameter:** n_neighbors = 6<br>**Validation Method:** 5-Fold Cross Validation | Train score with tuned model: 0.8985507246376812<br>Test score with tuned model: 0.8421052631578947<br>Optimal hyperparameters for KNN: {'n_neighbors': np.int64(12)}<br>Accuracy on test set: 0.84<br>Confusion Matrix (KNN):<br>[[ 51 17]<br>[ 13 109]]<br>Classification Report (KNN):<br>precision recall f1-score support<br>0 0.80 0.75 0.77 68<br>1 0.87 0.89 0.88 122<br>accuracy 0.84 190<br>macro avg 0.83 0.82 0.83 190<br>weighted avg 0.84 0.84 0.84 190 |