

Project Development Phase Model Performance Test

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

Model Performance Testing:

Our project Model Performance Testing:

S.No.	Parameter	Values	Screenshot																																																						
1.	Trained and compared Logistic Regression, Support Vector Classifier, and K-Nearest Neighbors. Logistic regression showed best performance.	Data Size: 583 records, 42 features Target Variable: Binary classification — Patient has liver cirrhosis (Yes/No) Train-Test Split: 80-20% Best Model: logistic regression Evaluation Metrics Used: Accuracy, Precision, Recall, F1-score, Confusion Matrix.	<pre>[>fire list •ith trained mel_li5t = •Icsistit regression': log, •Isistic r«ession CV': lcv, b7,es•: n, •xecost•: Edel, •Kidge classifier' : rg, 'Random Forest': rf, 'Support Vector Classifier': svc, 'KNN': knn # Assuming } trained km is print(model_eval_info_df)</pre> <table><thead><tr><th></th><th>Name</th><th>Accuracy</th><th>F1 Score</th><th>Precision</th><th>Recall</th></tr></thead><tbody><tr><td>0</td><td>logistic regression</td><td>78.42</td><td>84.53</td><td>91.80</td><td>78.32</td></tr><tr><td>1</td><td>logistic regression CV</td><td>82.63</td><td>87.36</td><td>93.44</td><td>82.01</td></tr><tr><td>2</td><td>naive bayes</td><td>35.79</td><td>0.00</td><td>0.00</td><td>0.00</td></tr><tr><td>3</td><td>XGBoost</td><td>35.79</td><td>6.15</td><td>3.28</td><td>50.00</td></tr><tr><td>4</td><td>Ridge classifier</td><td>84.21</td><td>88.37</td><td>93.44</td><td>83.82</td></tr><tr><td>5</td><td>Random forest</td><td>35.79</td><td>0.00</td><td>0.00</td><td>0.00</td></tr><tr><td>6</td><td>Support Vector Classifier</td><td>35.79</td><td>0.00</td><td>0.00</td><td>0.00</td></tr><tr><td>7</td><td>KNN</td><td>86.32</td><td>89.84</td><td>94.26</td><td>85.82</td></tr></tbody></table>		Name	Accuracy	F1 Score	Precision	Recall	0	logistic regression	78.42	84.53	91.80	78.32	1	logistic regression CV	82.63	87.36	93.44	82.01	2	naive bayes	35.79	0.00	0.00	0.00	3	XGBoost	35.79	6.15	3.28	50.00	4	Ridge classifier	84.21	88.37	93.44	83.82	5	Random forest	35.79	0.00	0.00	0.00	6	Support Vector Classifier	35.79	0.00	0.00	0.00	7	KNN	86.32	89.84	94.26	85.82
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2.	Accuracy	Training Accuracy - 91.30% (logistic_regression)	<pre>Train score with tuned model: 0.9130434782608695 Test score with tuned model: 0.8736842105263158 Optimal hyperparameters for KNN: {'n_neighbors': np.int64(6)} Accuracy on test set: 0.87 Confusion Matrix (KNN): [[51 17] [7 112]] Classification Report (KNN): precision recall f1-score support 0 0.88 0.75 0.81 68 1 0.87 0.94 0.91 122 accuracy 0.87 0.87 0.87 190 macro avg 0.88 0.85 0.86 190 weighted avg 0.87 0.87 0.87 190</pre>																																																						
3.	Validation Accuracy - 87.36%	Validation Accuracy -87.36%	<pre>Train score with tuned model: 0.9130434782608695 Test score with tuned model: 0.8736842105263158 Optimal hyperparameters for KNN: {'n_neighbors': np.int64(6)} Accuracy on test set: 0.87 Confusion Matrix (KNN): [[51 17] [7 112]] Classification Report (KNN): precision recall f1-score support 0 0.88 0.75 0.81 68 1 0.87 0.94 0.91 122 accuracy 0.87 0.87 0.87 190 macro avg 0.88 0.85 0.86 190 weighted avg 0.87 0.87 0.87 190</pre>																																																						