**Credit Risk Analysis Report**

The credit risk analysis is checking how well a logistic regression model can classify loans as healthy (0) or high-risk (1). Using metrics like recall, precision and F1 score helped to evaluate the model and received better results.

**Model Performance Overview**

1. **Healthy Loans:**

Precision: 1.00, Recall: 0.99, F1-score: 1.00

1. **High-Risk Loans:**

Precision: 0.84, Recall: 0.94, F1-score: 0.89

**Detailed Analysis**

**Precision for Healthy Loans (0):**

* A precision of 1.00 means the model predicts healthy loans **100% correctly.**

**Recall for Healthy Loans (0):**

* A recall of 0.99 means the model correctly identifies **99% of all actual healthy loans, but 1%** are incorrectly marked as high-risk.

**Precision for High-Risk Loans (1):**

* A precision of 0.84 means the model correctly predicts **84% of high-risk loans**, but 16% of loads predicted as high-risk were actually healthy.

**Recall for High-Risk Loans (1):**

* A recall of 0.94 means the model correctly identifies **94% of high-risk loans but 6 % should be marked as healthy.**

**F1- Score for Healthy Loans (0):**

* An F1-score of 1.00 means the model has a **perfect balance** between precision and recall for healthy loans.

**F1- Score for High-Risk Loans (1):**

* An F1-score of 0.89 means the model is doing well with high-risk loans, but it can be better, especially in precision.

**Model Results**

The model works really well at predicting healthy loans. It has perfect precision and recall for these loans, meaning it correctly identifies safe loans almost all the time.

**What can be done better?**

* The model could do better at predicting high-risk loans. Right now, 16% of loans marked as high-risk are actually healthy. This means the model sometimes confuses healthy loans with high-risk ones.
* The recall for high-risk loans could also be better. Currently, 6% of high-risk loans are missed and wrongly classified as healthy. If these loans are approved, it could cause financial problems.

**Next Steps**

To improve the model, we could try changing the features, fine-tuning the settings, or using more advanced models like random forests or XGBoost. Also, adjusting the decision threshold for high-risk loans might help balance precision and recall.

**Conclusion**

The logistic regression model works really well for both healthy and high-risk loans. However, there’s still room for improvement, especially with high-risk loans, to reduce mistakes and make the model more accurate. The current model is a good starting point and can be made even better.