

JPMorganChase

# Loan Default Prediction & Expected Loss Estimation

QUANTITATIVE RESEARCH TEAM — JP MORGAN CHASE VIRTUAL EXPERIENCE

[www.github.com/rohancmd](https://www.github.com/rohancmd)

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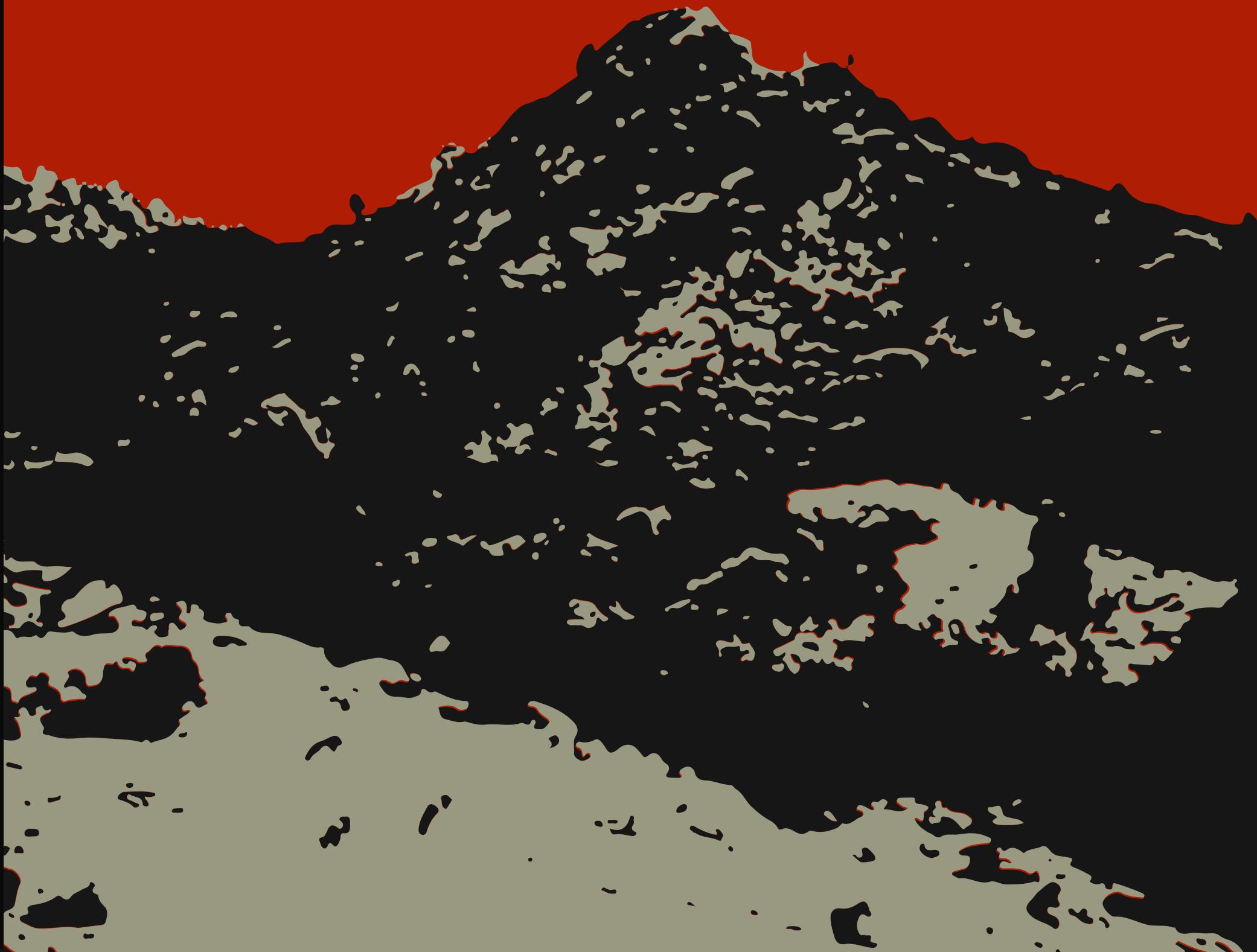
**Key insights and  
recommendations**

**Expected loss  
calculation**

**Data used for  
prediction**

**Models applied  
and results**

# Project Overview





# Our Approach

**Started by understanding the business objective: estimate Probability of Default (PD).**

**Explored borrower data to identify key financial indicators affecting default risk.**

**Selected two models for testing: Logistic Regression and Random Forest.**

**Compared model results using Accuracy and ROC-AUC metrics.**

**Integrated Probability of Default with Expected Loss calculation.**



# Expected Loss Calculation

## Example:

**Borrower details → Income: ₹60,000;  
Loan: ₹20,000; FICO: 620 Predicted PD =  
99.7% Recovery Rate = 10% Expected Loss  
=  $0.997 \times (1 - 0.10) \times 20,000 = ₹17,954$**

## Formula:

$$\text{Expected Loss (EL)} = \text{PD} \times (1 - \text{Recovery Rate}) \times \text{Loan Amount}$$

High debt and low FICO lead to higher default risk.

**Project**

# Modeling Performance



Both models show excellent performance, with Logistic Regression slightly ahead in interpretability and consistency

<b>Model</b>	<b>Accuracy</b>	<b>ROC-AUC</b>
Logistic Regression	0.9955	0.99557
Random Forest	0.9945	0.99969



- Use Expected Loss output to guide capital allocation and pricing.
  - Regularly retrain models with new borrower data for accuracy.
  - Consider adding macroeconomic variables for long-term improvement.
- FICO score and total debt are the strongest predictors of default.
  - Integrate this model into JP Morgan's risk assessment framework.

## Insights & Recommendations





A black and white photograph of a cross-section of a brain, showing various structures like the cerebellum and cerebral cortex.

**Thank you so much**

By Rohan Veer