FinSearch 2k25: End-Term Report

Understanding Credit Score Algorithms and Digital Lending in India

Team: Karthikesh Bangi, Mishit Sharma, P Manthan, Shresth Keshari

1. Introduction

Digital lending and fintech platforms have changed how credit is evaluated in India. They have moved past the old methods used by traditional credit bureaus like CIBIL. Our project "FinSearch 2k25" looks into the basics of credit scoring algorithms, how they have evolved, and how modern AI and machine learning techniques help improve financial inclusion. We focus on emerging fintech companies such as KreditBee, CASHe, and Faircent, which use alternative data points to assess credit and help customers who have been underserved or are new to credit.

2. Project Objectives

- To understand the basics of credit cards and their role in building credit history.
- To study credit scores, the factors that affect them, and the main bureaus that calculate these scores in India.
- To examine different credit scoring models and their underlying algorithms.
- To explore techniques used to create, validate, and adjust credit scoring models in changing market conditions.
- To investigate how artificial intelligence and machine learning improve credit scoring.
- To assess inequalities and biases in credit scoring systems and find ways to create fairer solutions.
- To conduct case studies on leading digital lending fintech platforms in India.
- To develop and evaluate a machine learning model that classifies credit scores based on demographic and financial data.

3. Roadmap and Completed Milestones

Checkpoint	Description	Status
1	How to choose your first credit card and its impact on credit score	completed
2	What are credit scores? Factors affecting scores, credit bureaus	completed
3	Types of credit scoring models (FICO, VantageScore, others)	completed

4	Techniques to create and validate scoring models	completed
5	Role of artificial intelligence and machine learning in credit scoring	completed
6	Role of artificial intelligence and machine learning in credit scoring	completed

All six roadmap items have been thoroughly researched and documented during the project.

4. Summary of Key Learnings and Deliverables

4.1 Credit Cards and Credit Building
We examined how credit cards help establish a positive credit history. We also discussed what young adults should consider when choosing their first credit card. We clarified the difference between credit rating and credit score, which laid a solid foundation for understanding creditworthiness.

4.2 Credit Scores and Influential Factors
Credit scores in India fall between 300 and 900, with higher scores indicating lower credit risk. We identified five main factors that influence scores: payment history, credit utilization, length of credit history, credit mix, and new credit inquiries. The major credit bureaus are TransUnion CIBIL, Equifax, Experian, and CRIF Highmark.

4.3 Credit Scoring Models
We analyzed the main scoring models, such as FICO and VantageScore, noting how they emphasize different data factors and algorithms. The landscape also includes proprietary models used by fintech companies that rely on broader data inputs.

4.4 Model Creation and Validation
We emphasized the need for scoring models that adjust to economic cycles. These models require ongoing validation to remain predictive and adapt to changes in consumer behavior during recessions or expansions.

4.5 AI and ML in Credit Scoring
Artificial intelligence, particularly deep learning, offers tools that help credit scoring models learn from various data sources, making predictions more accurate. Both supervised and unsupervised learning techniques are used.

4.6 Bias in Credit Scoring

We looked into how the quality and availability of underlying data can negatively affect disadvantaged groups, leading to structural inequalities even when algorithms are unbiased. We recommend improving data inclusivity and transparency.

4.7 Case Studies: KreditBee, CASHe, Faircent
These fintechs show innovative methods by using non-traditional data such as mobile usage, employment stability, social media, and education to assess creditworthiness beyond standard credit scores. Their models help speed up onboarding and risk assessment while reducing bias.

4.8 Role of Credit Cycles
We explored how economic credit cycles affect credit availability, borrower behavior, and risk management. Boom periods encourage borrowing and credit expansion, while slowdowns can restrict lending and increase default risks. Fintechs need to adjust with risk-based pricing and flexible models.

4.9 Machine Learning Model for Credit Score Classification
We used a dataset of demographic and financial attributes to develop and evaluate a Random Forest classifier that predicts credit score categories (High, Average, Low). The model included preprocessing of features, balancing class weights, tuning hyperparameters, and cross-validation for evaluation. The model achieved high accuracy (over 96%) and precision, showing the effectiveness of data-driven credit risk classification.

5. Technical Implementation Summary
Data preprocessing involved managing categorical and numerical features with methods like imputation, scaling, and one-hot encoding.
A stratified train-test split ensured balanced sampling across credit score classes.
Class weights were calculated to address class imbalance.
Random Forest was chosen for its interpretability and performance, but alternative models (Decision Tree, SVC, SGD) were also supported.
Model hyperparameters were refined using RandomizedSearchCV.
Evaluation metrics included accuracy, precision, recall, F1-score, and ROC curves.
Final models and predictions were prepared for further analysis and integration.

6. Conclusion
The FinSearch 2k25 project met its goals by combining study, case analysis, and practical machine learning work to deepen our understanding of credit scoring systems in India's digital lending space. Our findings highlight how AI-driven credit analytics can improve financial access while keeping effective risk management. Ongoing innovation and responsible model oversight are crucial for reducing bias and adapting to economic cycles in sustainable credit markets.

7. Team Contributions
P Manthan:Evaluation metrics and development of credit score classification models using machine learning
Karthikesh Bangi: Research on the growth of digital lending and fintech trends.

Mishit Sharma: In-depth case studies of key fintech firms KreditBee, CASHe, and Faircent.
Shresth Keshari: Analysis of credit cycles in India and their effects on lending.