# LendingClub Loan Classification

Module 5 Project
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# Overview

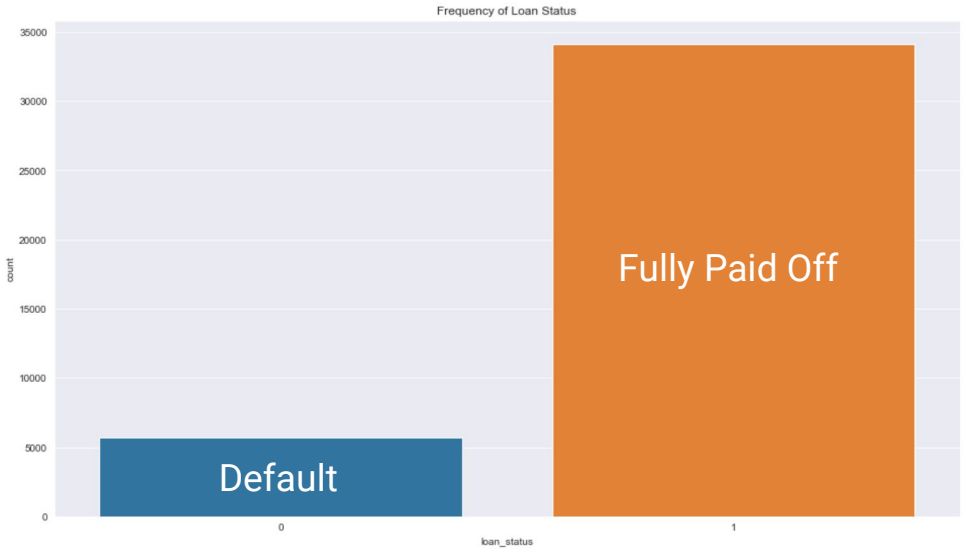
1. Stakeholder Information
2. Methodology
3. Data Exploration & Preprocessing
4. Model Selection
5. Actionable Insights

# Stakeholder Information

- Lending Club is a peer-to-peer lending platform for various types of loans
- LC offers credit at a lower cost than traditional loan sources
- LC provides servicing & screening of loan applicants
- Investors can purchase ‘notes’ of loans

**Mission Statement:** To develop a machine learning classification model, given applicants’ loan application data, to accurately classify whether the applicant will default on the loan.

# Data Exploration & Preprocessing




- LendingClub Statistics - Website
- 24 features, 38646 entries (Misc. Loan Titles;  2007 - 2011)
- Features: Income, Loan Purpose, FICO Avg., Grade, Term, etc.
- Target Variable:
    - Loan Status: **Default** or **Fully Charged Off**
- Percentage of borrowers with loans fully paid: 85.75 %

# Model Selection

- 7 Classification models trained & tested
  - KNN, Random Forest, SVM, Logistic, XGboost etc.
- Evaluation Methods:

| Model | Accuracy Score | AUC Score |
|---|---|---|
| Random Forest DT | 59.21 % | 0.62 |
| Random Forest GridSearch | 70.60 % | 0.62 |
| SVM | 63.41% | 0.62 |
| XGboost | 88.38 % | 0.63 |
| KNN | 72.38 % | 0.53 |
| Logistic Regression | 65.01% | 0.63 |

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# Actionable Insights

- Credit Grade & FICO average are most influential
- XGboost was significantly best performing model
    - Classification method: 90% of loans are being paid off
- Further hyperparameter tuning necessary