

LENDING CLUB CASE STUDY
GROUP STUDY ASSIGNMENT
C67 BATCH

SUBMISSION

By

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LENDING CLUB CASE STUDY

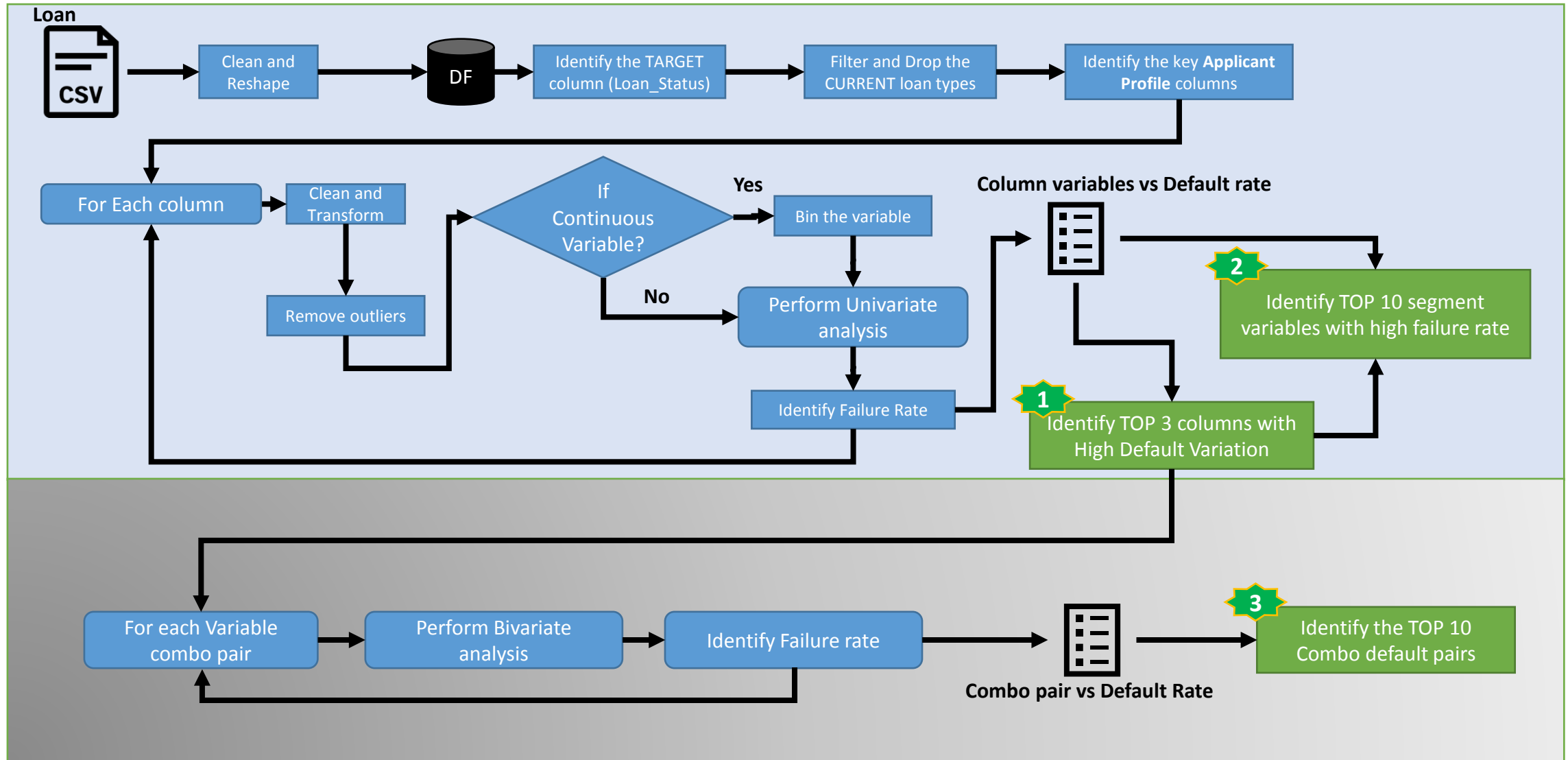
OVERVIEW

To analyse the Lending Club past loan records and build a system to validate future loan applicants based on the applicant's profile and provide a set of recommendations predicting the risk and impact of a loan application.

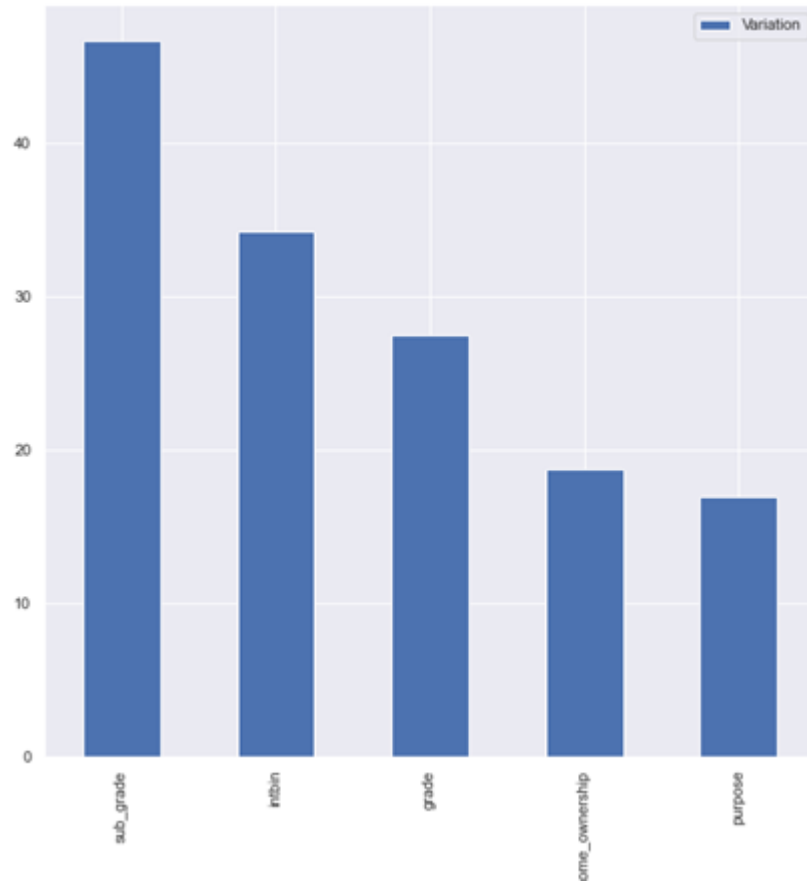
OBJECTIVES

- Identify top 3 features that drive Defaults
- Identify top 5 feature values that impacts Default rate
- Identify top 10 Risky combinations of the above top variables

RISK ANALYSIS PROCESS



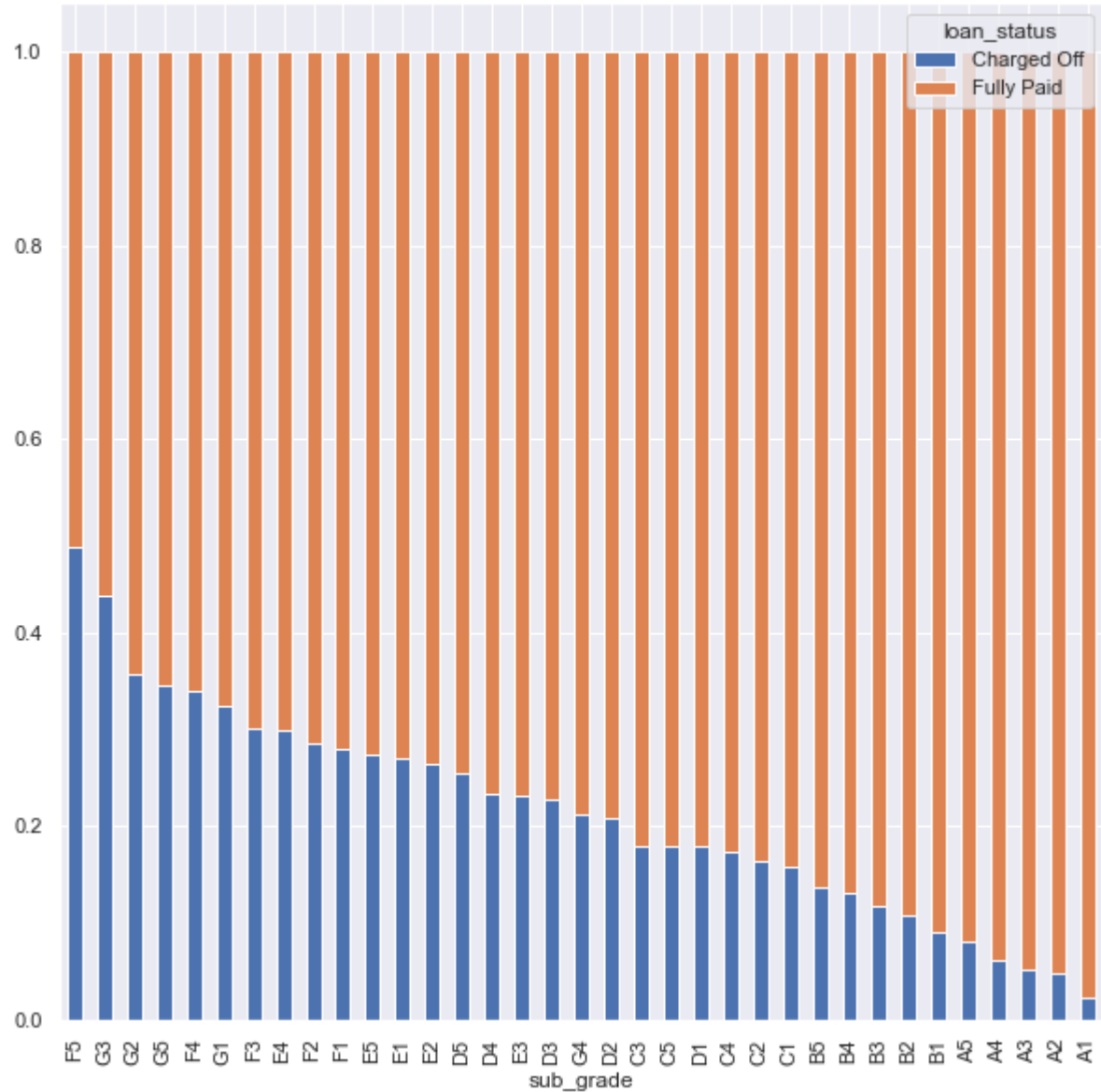
FEATURE VARIATION ANALYSIS



Feature	% Variation
Sub Grade	46.63
Interest Rate	34.25
Grade	27.49
Home Ownership	18.75
Purpose	16.93
Term	14.12
Loan Amount	7.49
Annual Income	7.13
DTI value	4.40
Verification Status	3.82
Employment Length	2.50

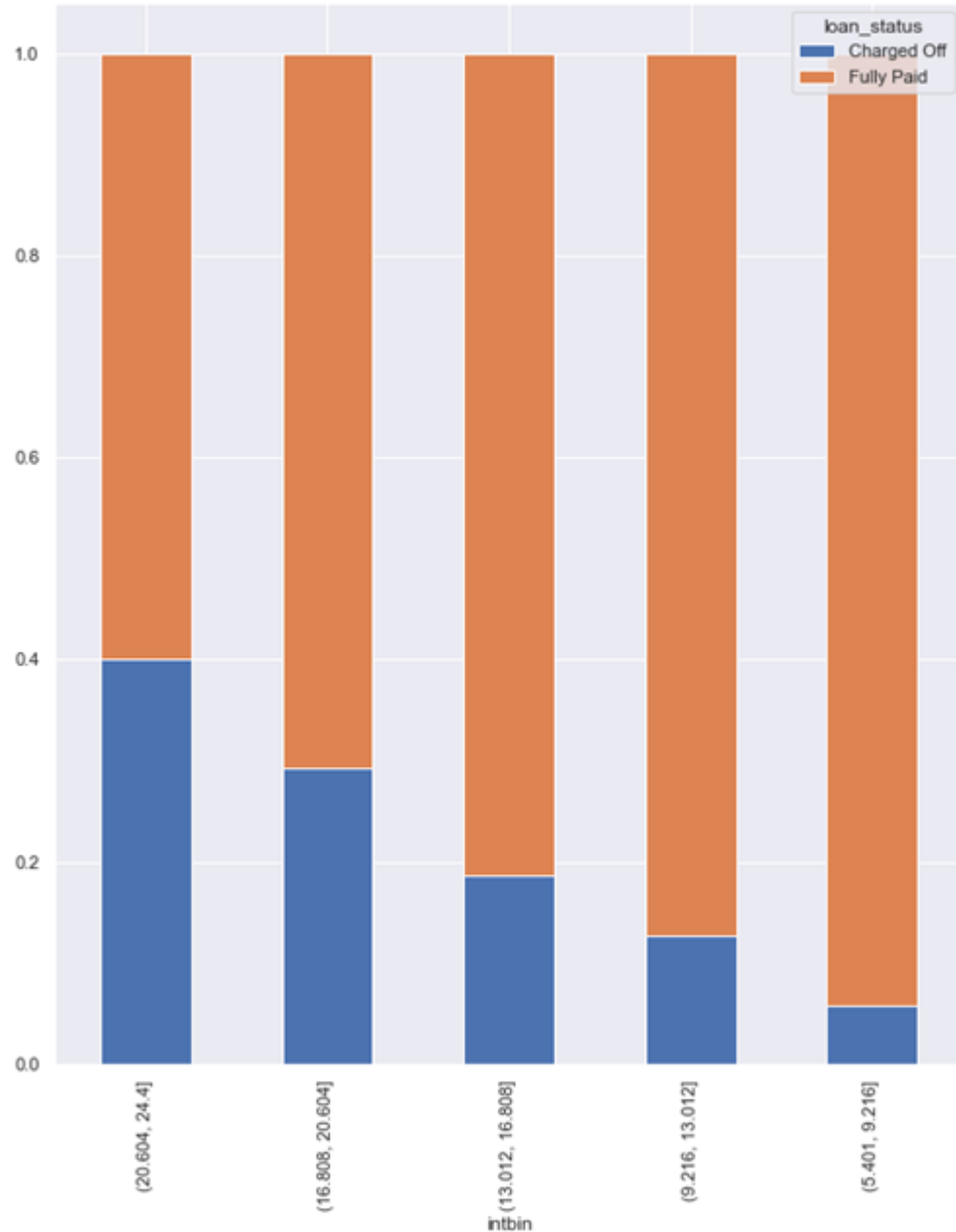
- Variation is the difference in default rates within a Feature for different segment values
- Higher the difference the more volatile the feature

SUB GRADE DEFAULT TREND



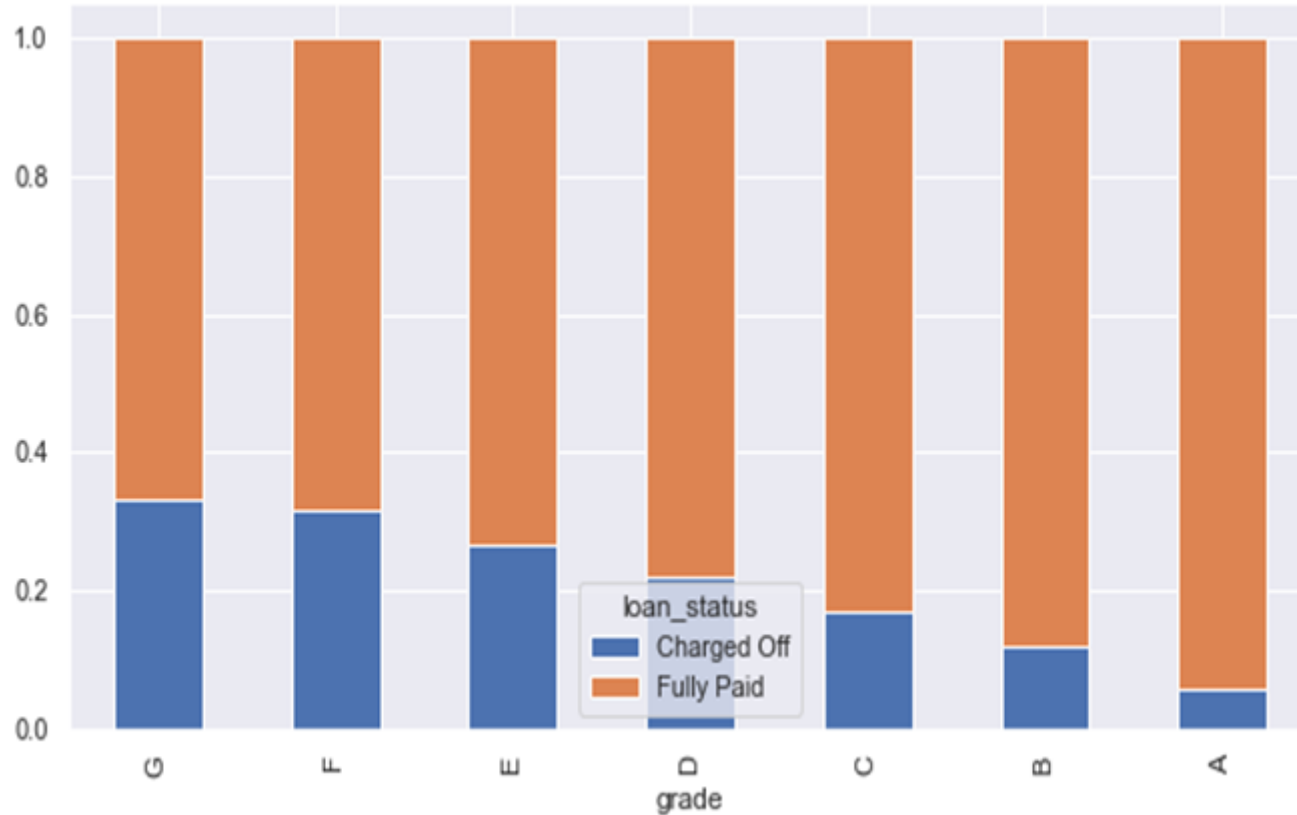
- Sub Group displays a strong trend of different values having default rates
- E, F, G grade Loan types seem to default more
- A,B grade loan types tend to be relatively safer

INTEREST RATE DEFAULT TREND



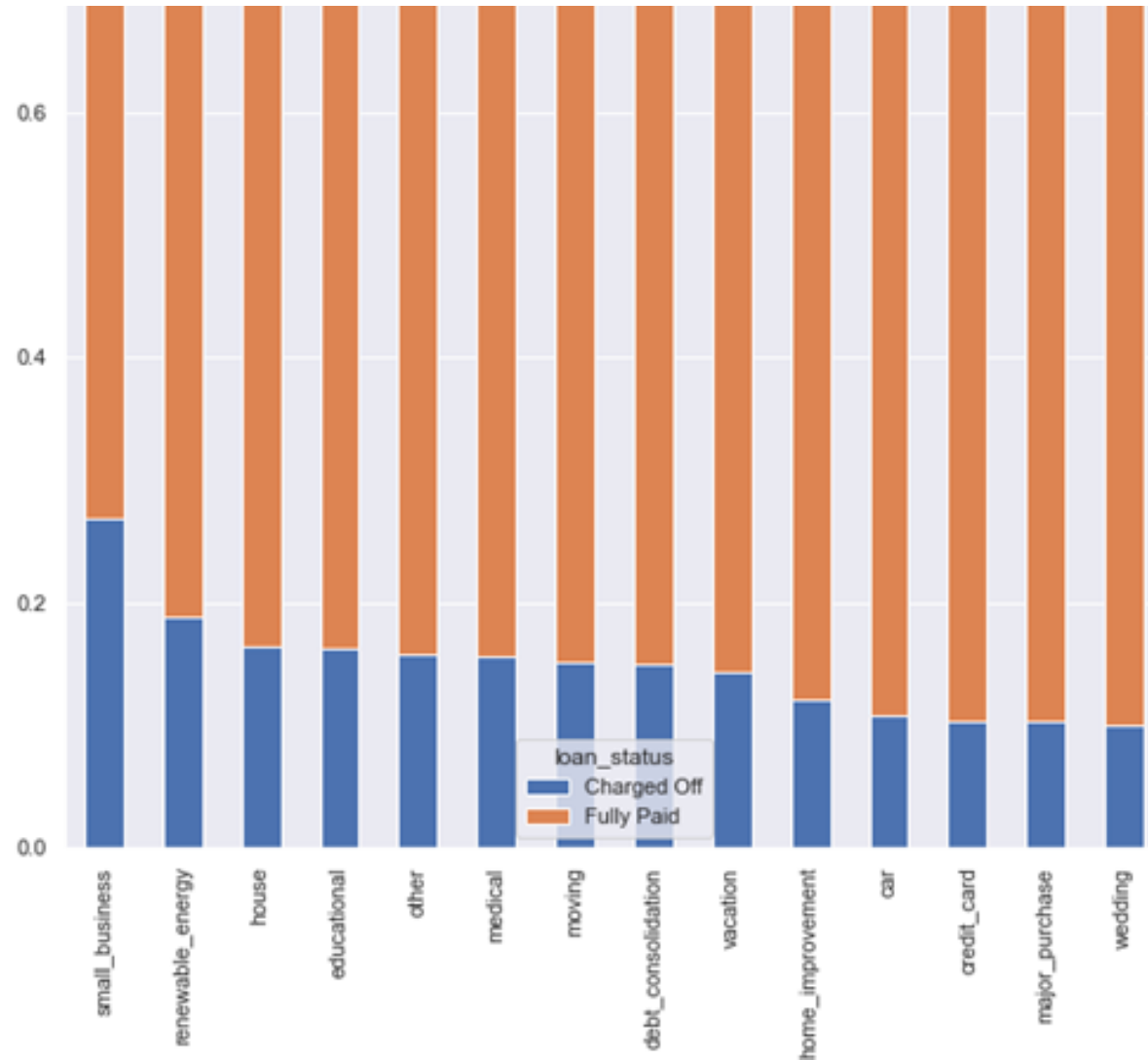
- Interest Rates also have a significant trends for different Rate segments
- We find that Interest Rates above 16% have a higher risk of default

GRADES DEFAULT TREND



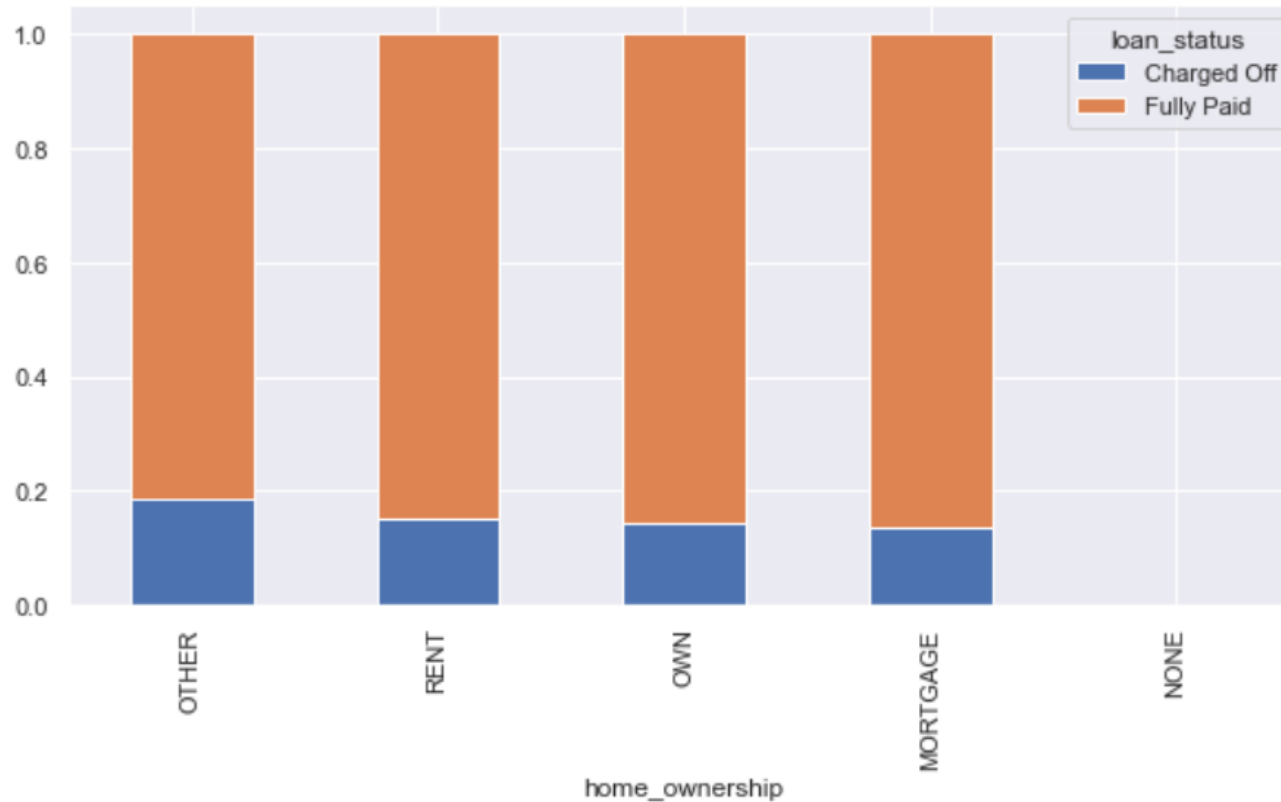
- Grades as expected have similar trend with Sub Grades
- E, F, G grade Loan types seem to default more
- A,B grade loan types tend to be relatively safer

PURPOSE DEFAULT TREND



- Purpose has only 2 variables with key failure rate
- Small business & Renewable Energy are top defaulters

HOME OWNERSHIP DEFAULT TREND



- Homeowner ship DOES NOT have significant variation
- We will ignore this Feature

KEY FEATURES DRIVING DEFAULT

Feature	% Variation
Sub Grade	46.63
Interest Rate	34.25
Grade	27.49
Home Ownership	18.75
Purpose	16.93
Term	14.12
Loan Amount	7.49
Annual Income	7.13
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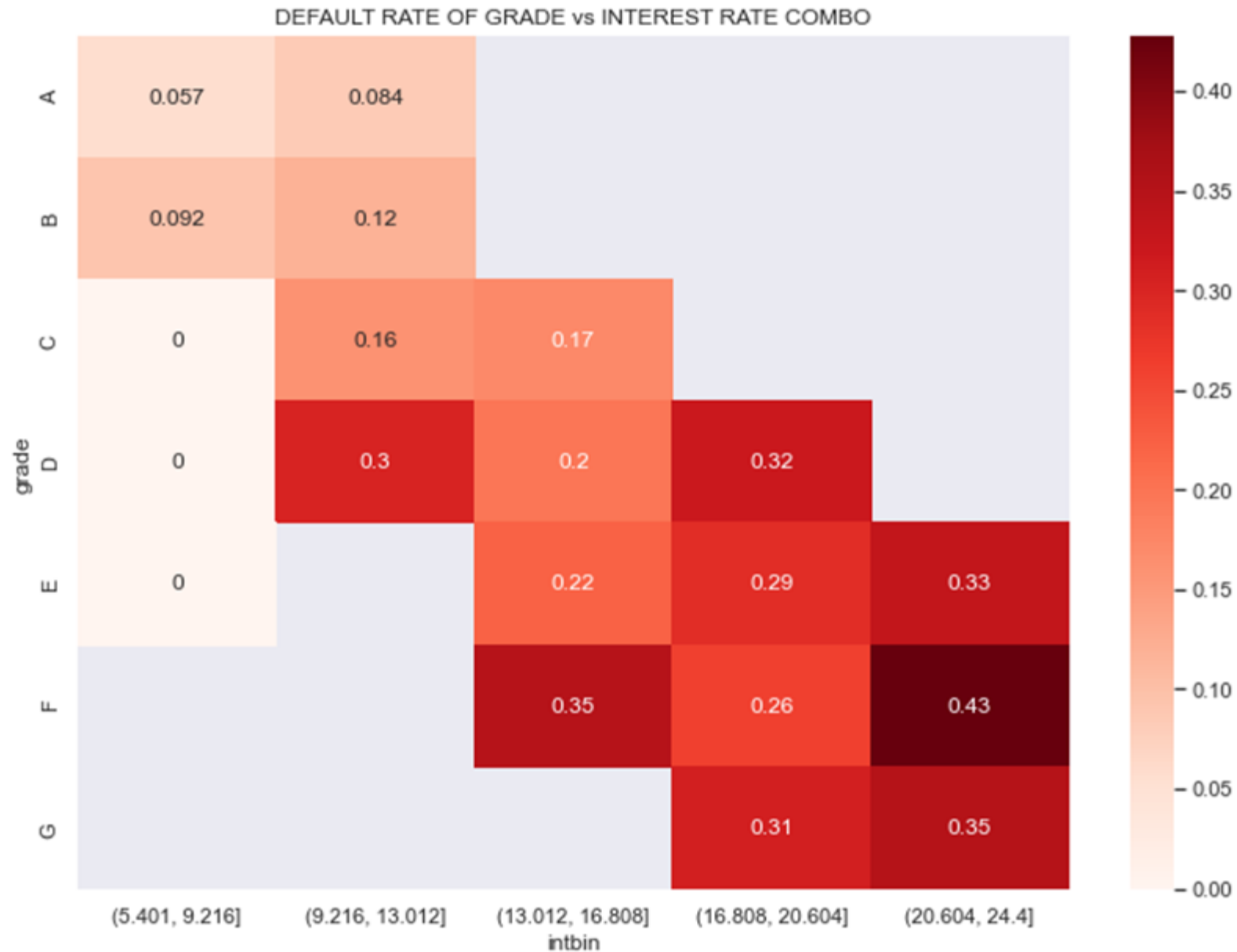
- Since Sub Grade is a drilled down version of Grade -> Lets ignore Sub grade as a driving feature in place for GRADE
- We will ignore Homeownership as well as on closer look it did not have strong values to influence Default Rate
- Hence the top 3 Features that drive Default rate are
 - Interest Rate
 - Grade
 - Purpose
- Based on these 3 Features we can derive
 - Top 10 Default values
 - Inter feature patterns
 - Top 10 Risk Combos

TOP 10 DEFAULT VALUES

Feature Values	% Default
Interest Rate -(20.604, 24.4]	40.05
Grade G	33.33
Grade F	31.79
Interest Rate (16.808, 20.604]	29.22
Purpose small_business	26.91
Grade E	26.63
Grade D	21.94
Purpose renewable_energy	18.89
Interest Rate (13.012, 16.808]	18.70
Grade C	16.92

- For the Top 3 Features identified, Default rates of individual values were derived
- All these values were then merged into a single data source
- Top 10 defaults of the entire list is finally identified along with their Risk %

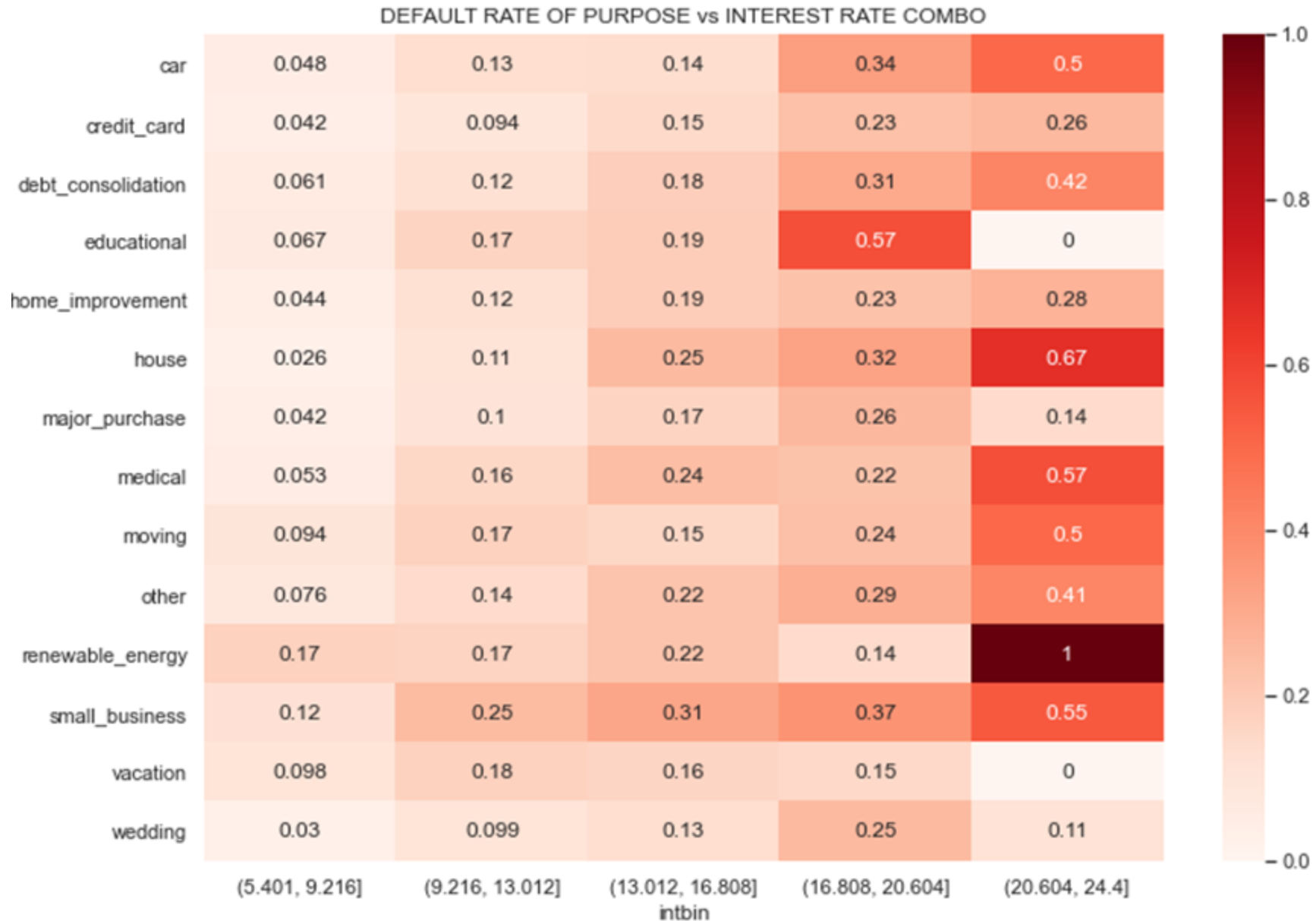
GRADE vs INTEREST DEFAULT PATTERN



GRADE vs PURPOSE DEFAULT PATTERN



INTEREST RATE vs PURPOSE DEFAULT PATTERN



TOP 10 DEFAULT VALUES

Risky Combinations	# of Failures	# of Occurrence	Risk %
Purpose -debt_consolidation, & Interest Rate (16.808, 20.604])	521	1706	30.54
(Grade D, Interest Rate (16.808, 20.604])	233	725	32.14
(Purpsoe - debt_consolidation, Grade F)	167	484	34.50
(Purpose - Small_business, Interest Rate (13.012, 16.808])	157	501	31.34
(Grade F, Interest Rate (20.604, 24.4])	121	283	42.76
(Purpose - debt_consolidation, Interest Rate (20.604, 24.4])	104	249	41.77
(Purpose - small_business, Grade D)	87	264	32.95
(Purpose - Small_business, Interset Rate -(16.808, 20.604])	78	212	36.79
(Purpose - small_business, Grade -E)	61	167	36.53
(Grade - G, Interest Rate(20.604, 24.4])	53	151	35.10

- Top 10 Riskiest Combinations with signification # of transactions
- Risk % denotes the default rate till now
- Even though **Debt consolidation** was not the top defaulter amongst purpose but its combination below does have a higher default rate
 - Grade F
 - Interest rate > 16%

RECOMMENDATIONS

FACTORS	RECOMMENDATIONS
SIGNIFICANT DEFAULT FEATURES	INTEREST RATE, GRADE, PURPOSE
TOP RISK INCURRING VALUES DEFAULT FEATURE WISE	<p>INTEREST RATE</p> <ul style="list-style-type: none"> ➤ ABOVE 16% <p>GRADE</p> <ul style="list-style-type: none"> ➤ GRADE F ➤ GRADE G <p>PURPOSE</p> <ul style="list-style-type: none"> ➤ SMALL BUSINESS ➤ DEBT RECONSOLIDATION
KEY RISKY COMBINATIONS	<ul style="list-style-type: none"> ➤ GRADE F, INT RATE > 20% ➤ DEBT CONSOLIDATION, INT RATE ABOVE 20% ➤ SMALL BUSINESS, INT RATE > 16%