Lending Club Case Study

Background

Lending Club, a consumer finance company, is the largest online loan marketplace, facilitating various loans such as personal loans, business loans, and financing of medical procedures to urban customers. Borrowers can easily access lower interest rate loans through it's fast online platform. Upon receiving a loan application, the company has to make a decision for loan approval based on the applicant's profile.

Based on the trend and existing customer database, company has aimed to extend its reach to more customers by utilizing most precise data analytics.

Business Objective

Based on the Customer data which contains information about past loan applicants and whether they 'defaulted' or not. Business aims to identify patterns which indicate if a person is likely to default, which may be used for taking actions such as denying the loan, reducing the amount of loan, lending (to risky applicants) at a higher interest rate, etc. to minimize the credit loss.
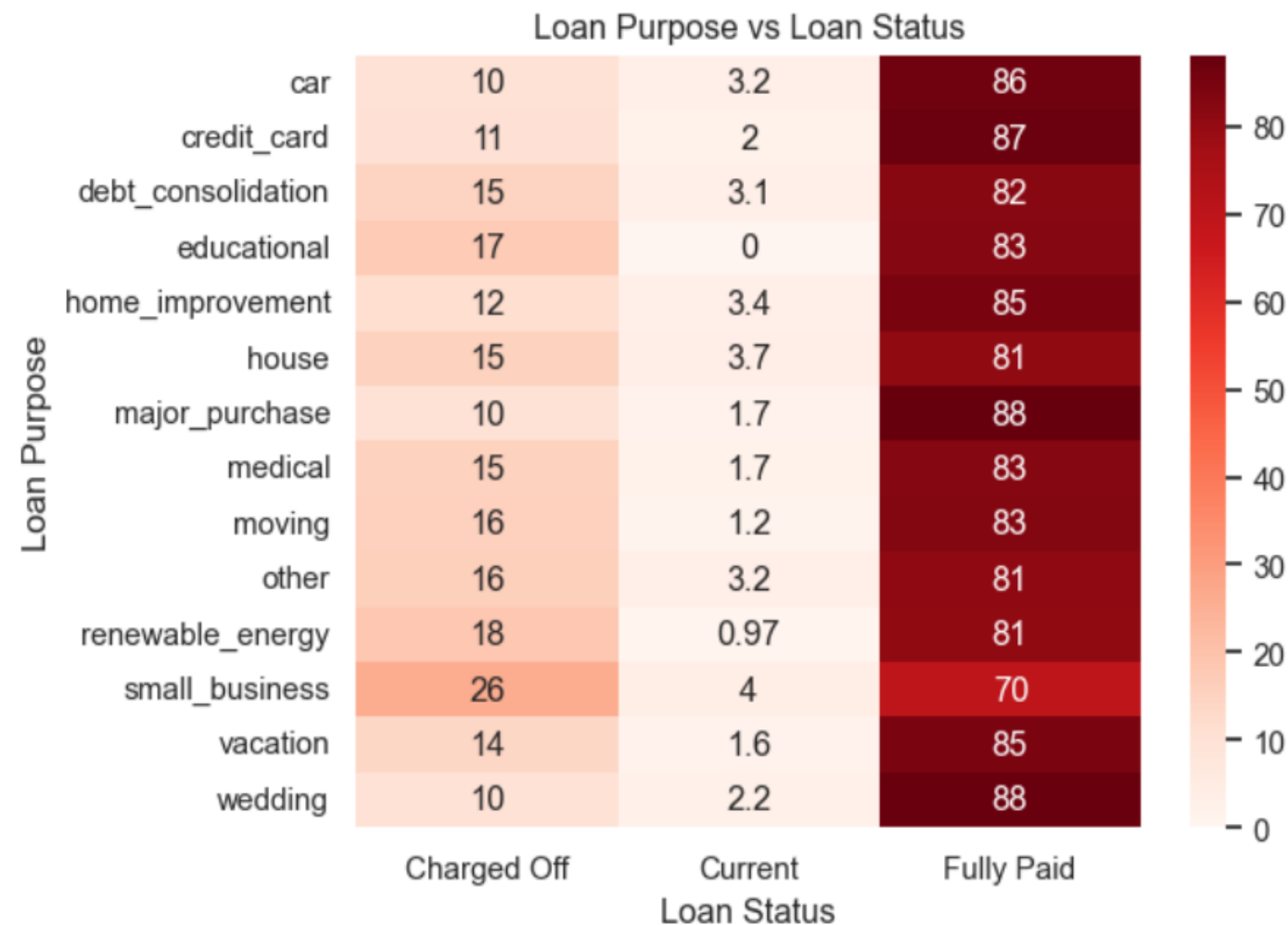
Strategy

For this company is intended to understand the driving factors / variables which could lead the loan to default, i.e. the variables which are strong indicators of default. The company can utilize this analysis for its portfolio to asses the risk to improve lending and increase profits margins at the end.

1. Data Analysis: Loan Purpose vs Loan Status

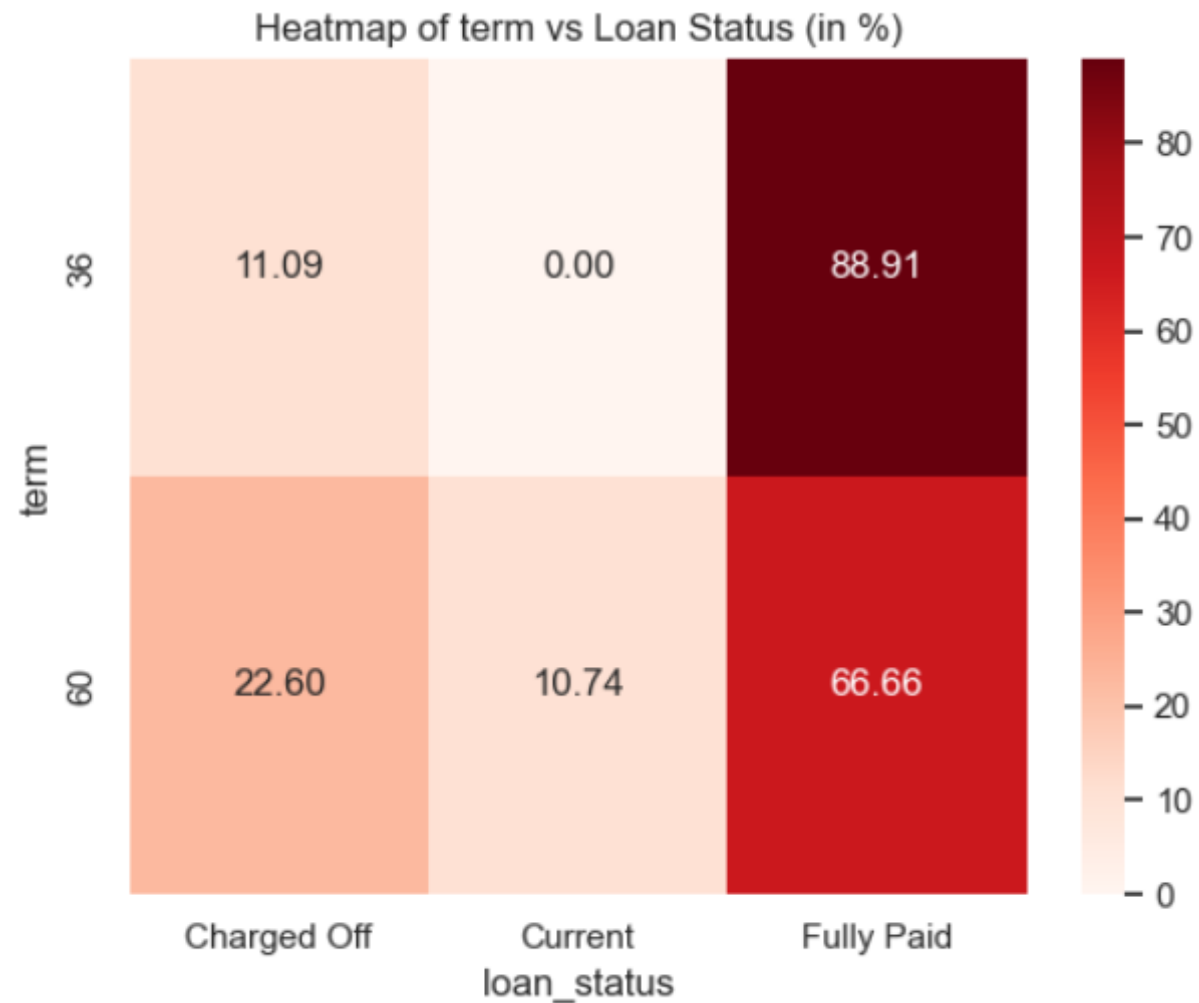Insight:

Small business are tend to default more.

Loan Purpose vs Loan Status

Loan Purpose	Charged Off	Current	Fully Paid
car	10	3.2	86
credit_card	11	2	87
debt_consolidation	15	3.1	82
educational	17	0	83
home_improvement	12	3.4	85
house	15	3.7	81
major_purchase	10	1.7	88
medical	15	1.7	83
moving	16	1.2	83
other	16	3.2	81
renewable_energy	18	0.97	81
small_business	26	4	70
vacation	14	1.6	85
wedding	10	2.2	88

Loan Status

2. Data Analysis: Term vs Loan Status

Insight:

Long Term Loan of 60 months have tendency to get default

Heatmap of term vs Loan Status (in %)
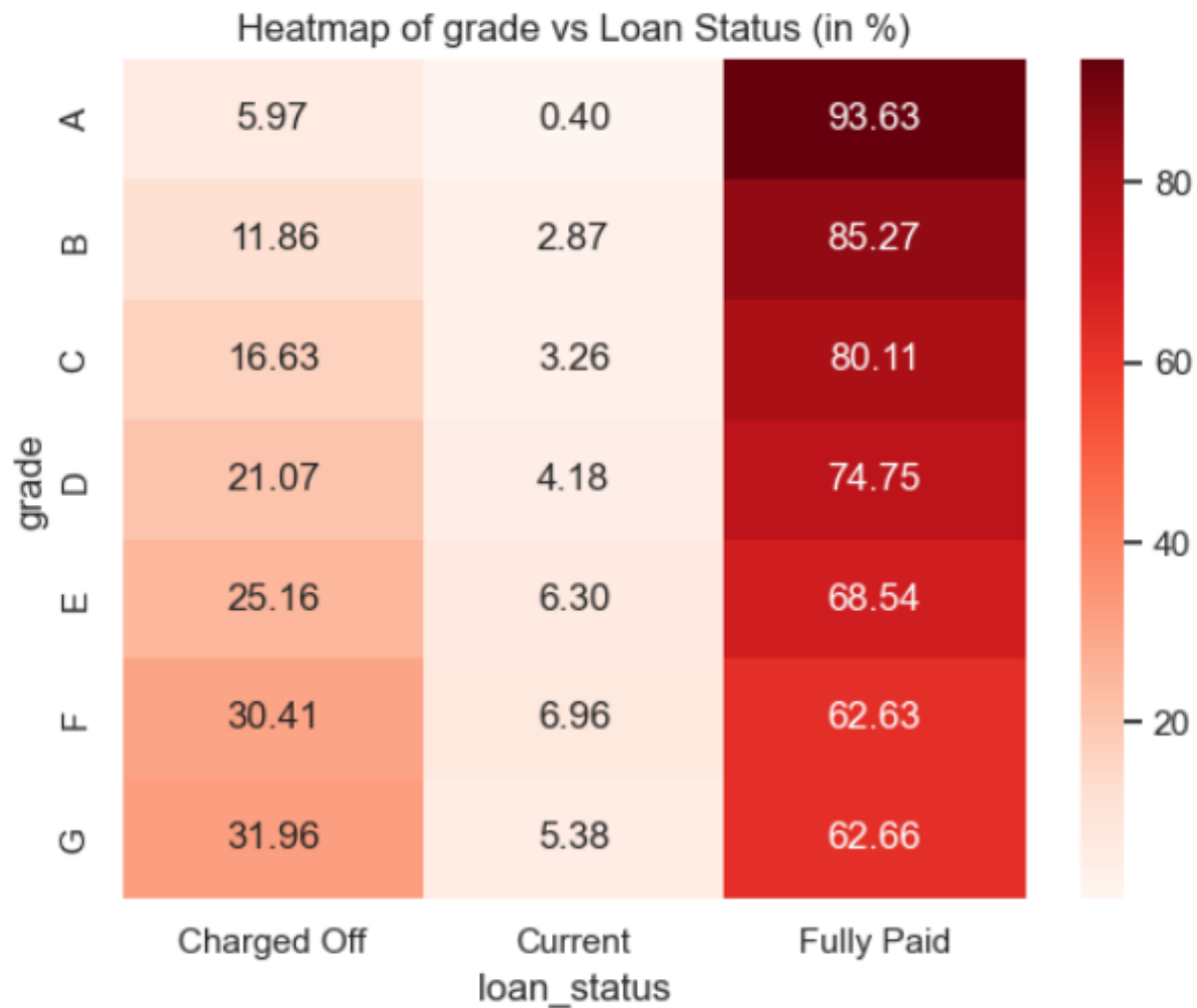
3. Data Analysis: Grade vs Loan Status

Insight:

Lower the grades have higher the tendency to get default.

Heatmap of grade vs Loan Status (in %)

4. Data Analysis: Loan Status% by Sub-Grades

Insight:

Sub-Grades from D2-G5 have higher tendency to default with F5 & G3 having extreme tendency to default


Loan Status% by Sub-Grades

Sub-Grade	Charged Off	Current	Fully Paid
A1	2.6	0	97
A2	4.9	0	95
A3	5.7	0	94
A4	6.2	0.45	93
A5	7.9	0.99	91
B1	9.3	1.8	89
B2	11	2.7	86
B3	12	3.2	85
B4	13	3	84
B5	13	3.3	84
C1	16	3.8	81
C2	16	4	80
C3	18	2.7	80
C4	17	2.4	80
C5	18	2.7	80
D1	18	0	82
D2	20	4.6	75
D3	22	4.9	73
D4	22	6.4	72
D5	24	4.6	72
E1	26	5.4	69
E2	25	6.4	69
E3	22	6.7	72
E4	28	6.6	66
E5	26	7	67
F1	28	7.3	65
F2	28	6.4	65
F3	28	5.9	66
F4	32	10	58
F5	46	4.2	50
G1	30	9.6	61
G2	36	1.3	63
G3	40	6.2	54
G4	23	3.6	73
G5	33	3.3	63

Loan Status

5. Data Analysis: Revolving Line Utilization Rate vs Loan Status

Insight:

Defaulters tend to have a higher median revolving line utilization rate or else they are using more credit out of the total available credit.

Revolve Util vs Loan Status
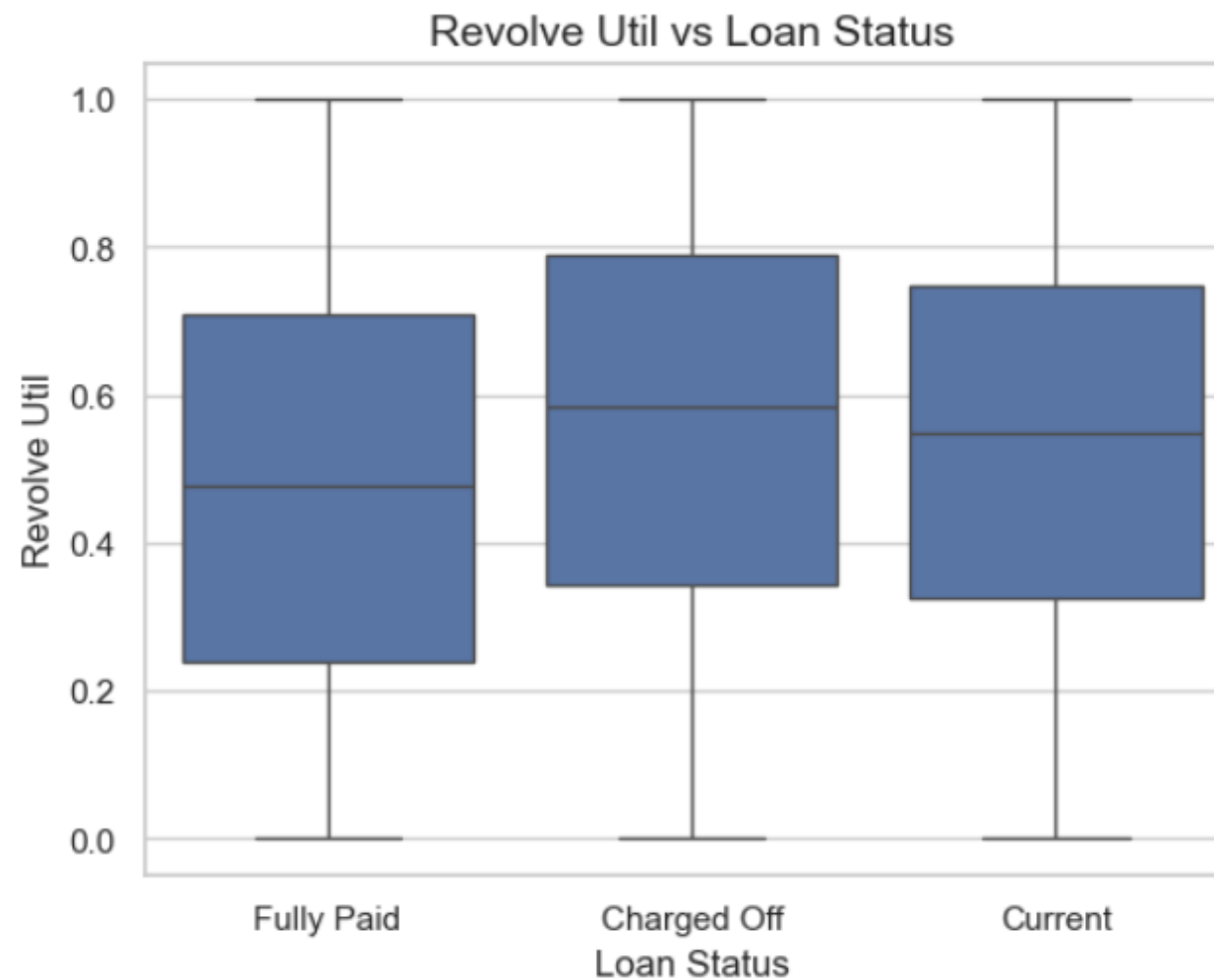
6. Data Analysis: Loan Status % by Public Record of bankruptcy

Insight:

If there is at-least 1 or more public bankruptcy logged, higher will be the chances of default.

loan_status pub_rec_bankruptcies	Charged Off	Current	Fully Paid
0.0	13.770562	2.949687	83.279751
1.0	21.863799	2.210275	75.925926
2.0	28.571429	28.571429	42.857143

7. Data Analysis: Employee Count by Loan Status

Insight:

In given dataset Defaulter employee count is in between fully paid and current type.

Employee Count Vs.Loan Status
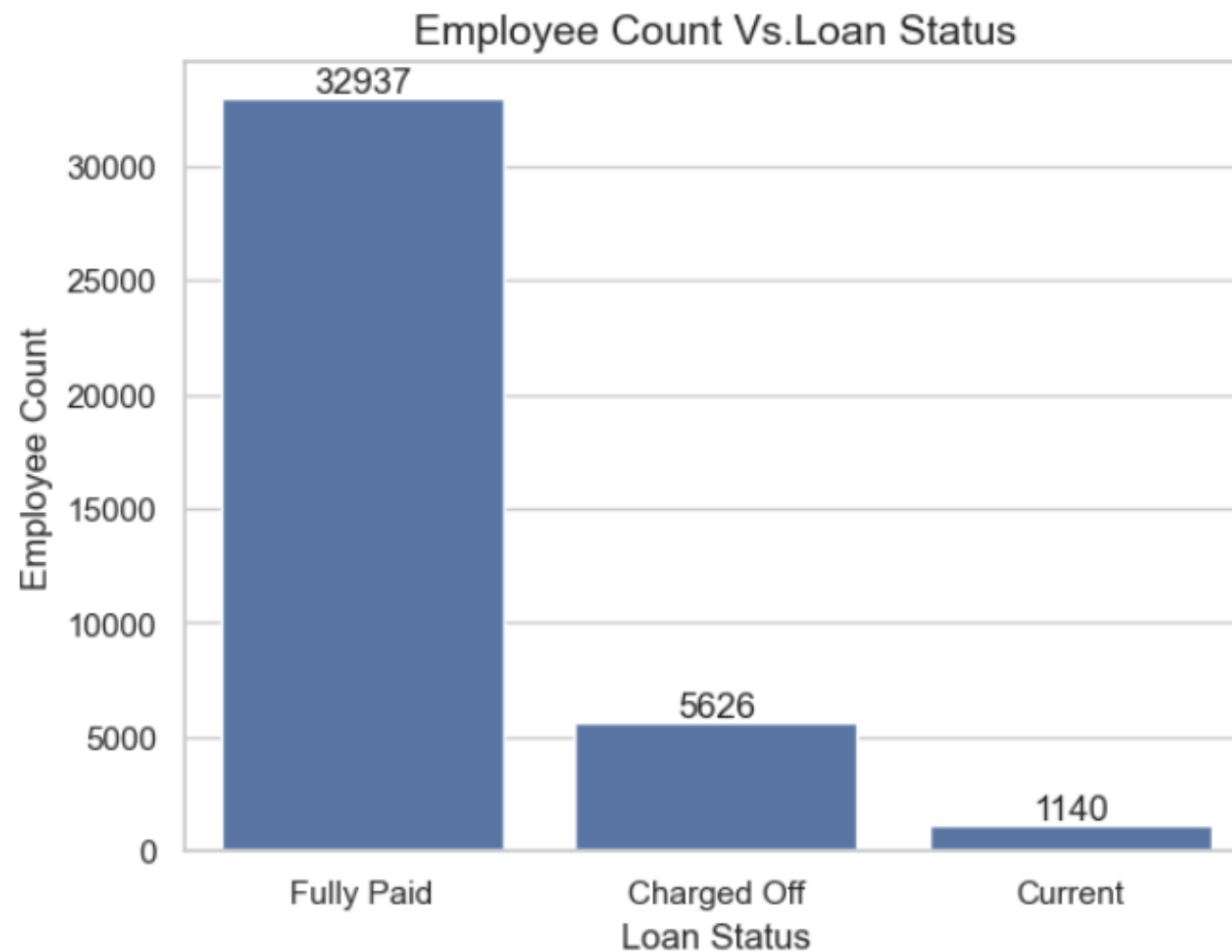
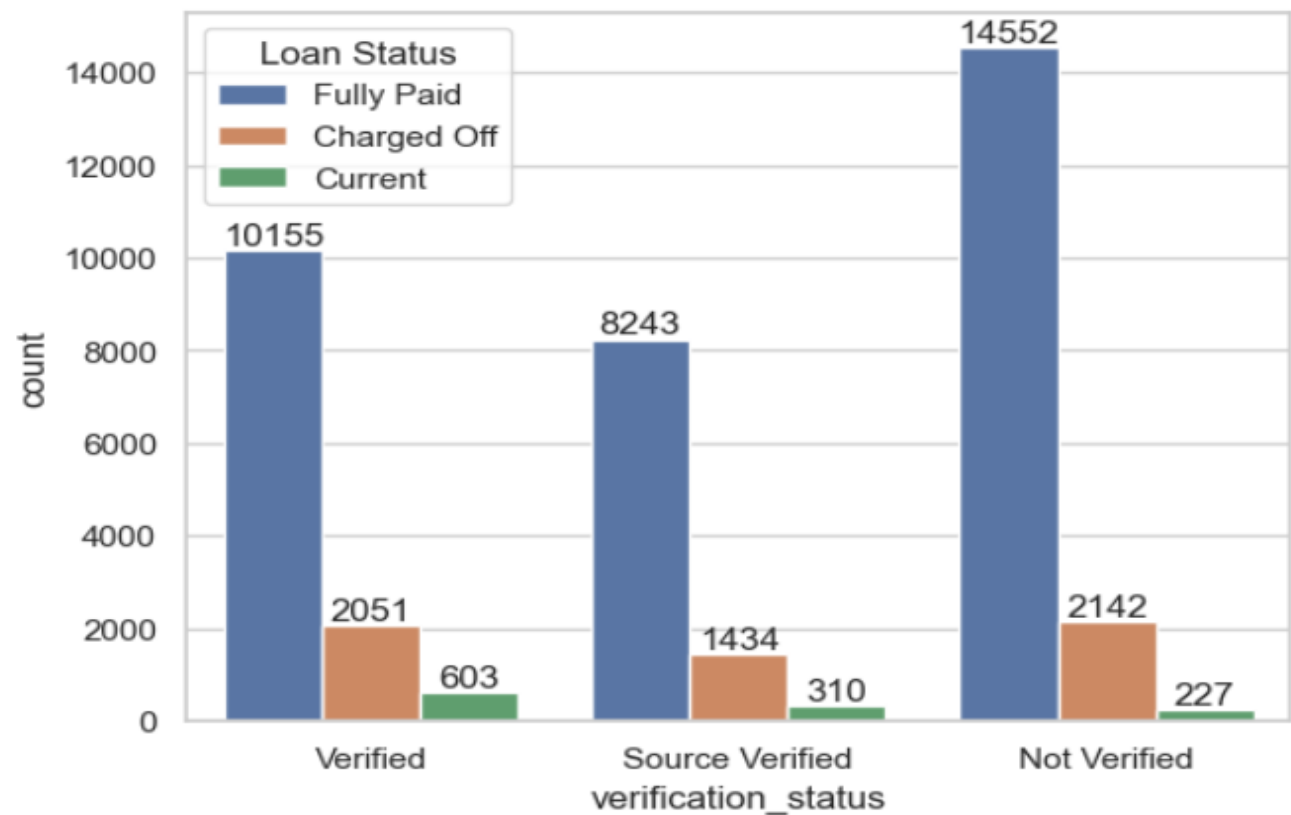# 8. Data Analysis: Employee Count vs Loan Issue year

Insight:

1. Year-wise no. of loan issue count keep increasing.

2. Charged of % decreased from 2007 - 2009 & further increased from 2009 – 2011.
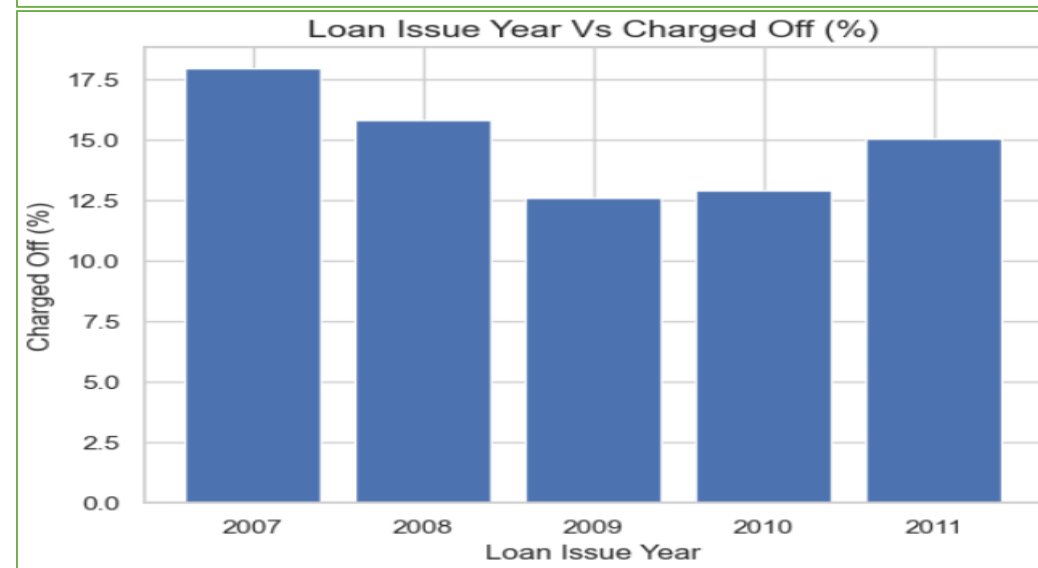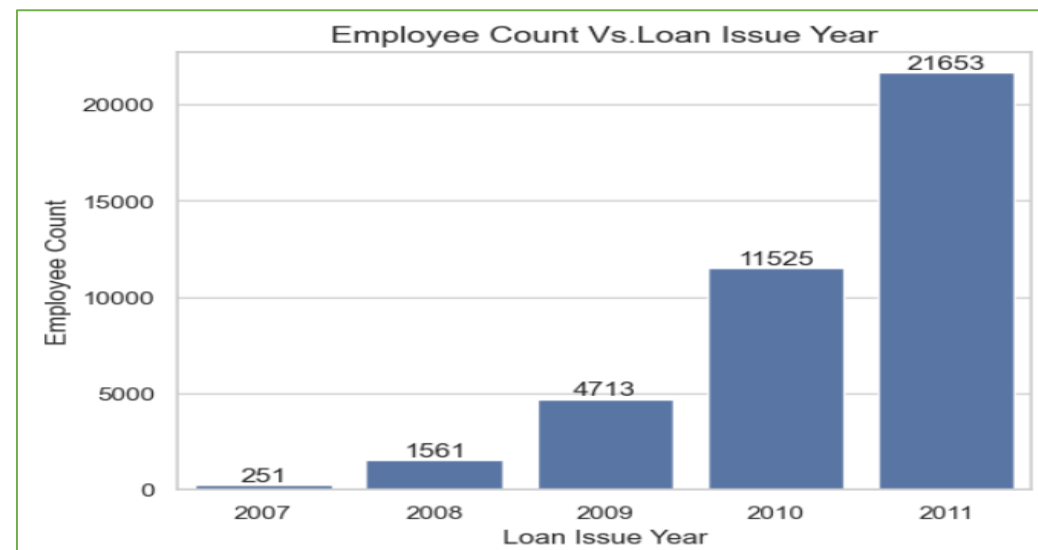
9. Data Analysis: Employee Count & Loan Status% by Verification Status

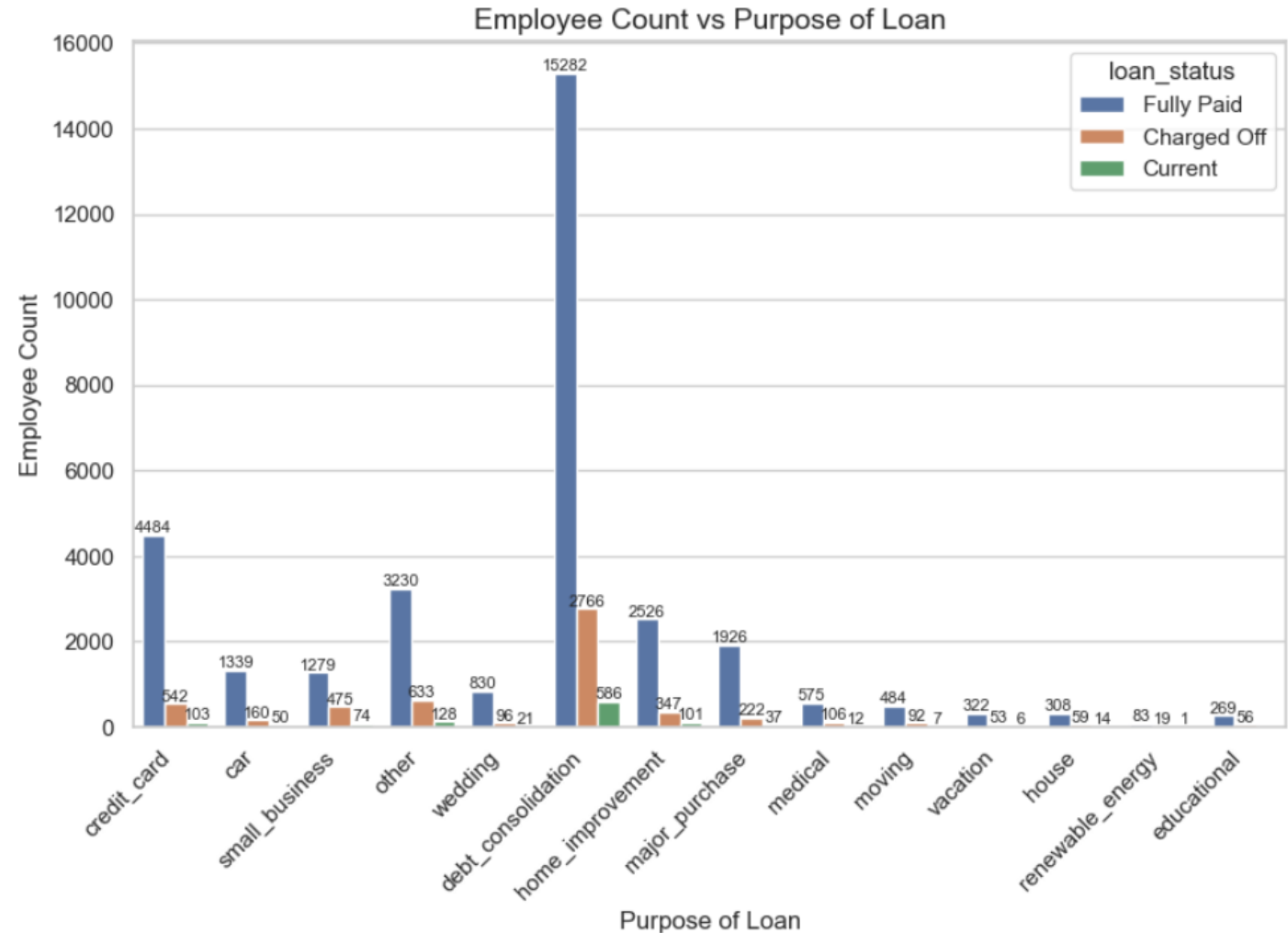Insight:

Verified status has more percentage of defaulters.

loan_status verification_status	Charged Off	Current	Fully Paid
Not Verified	12.664065	1.342083	85.993851
Source Verified	14.365859	3.105590	82.528551
Verified	16.006871	4.708363	79.284766

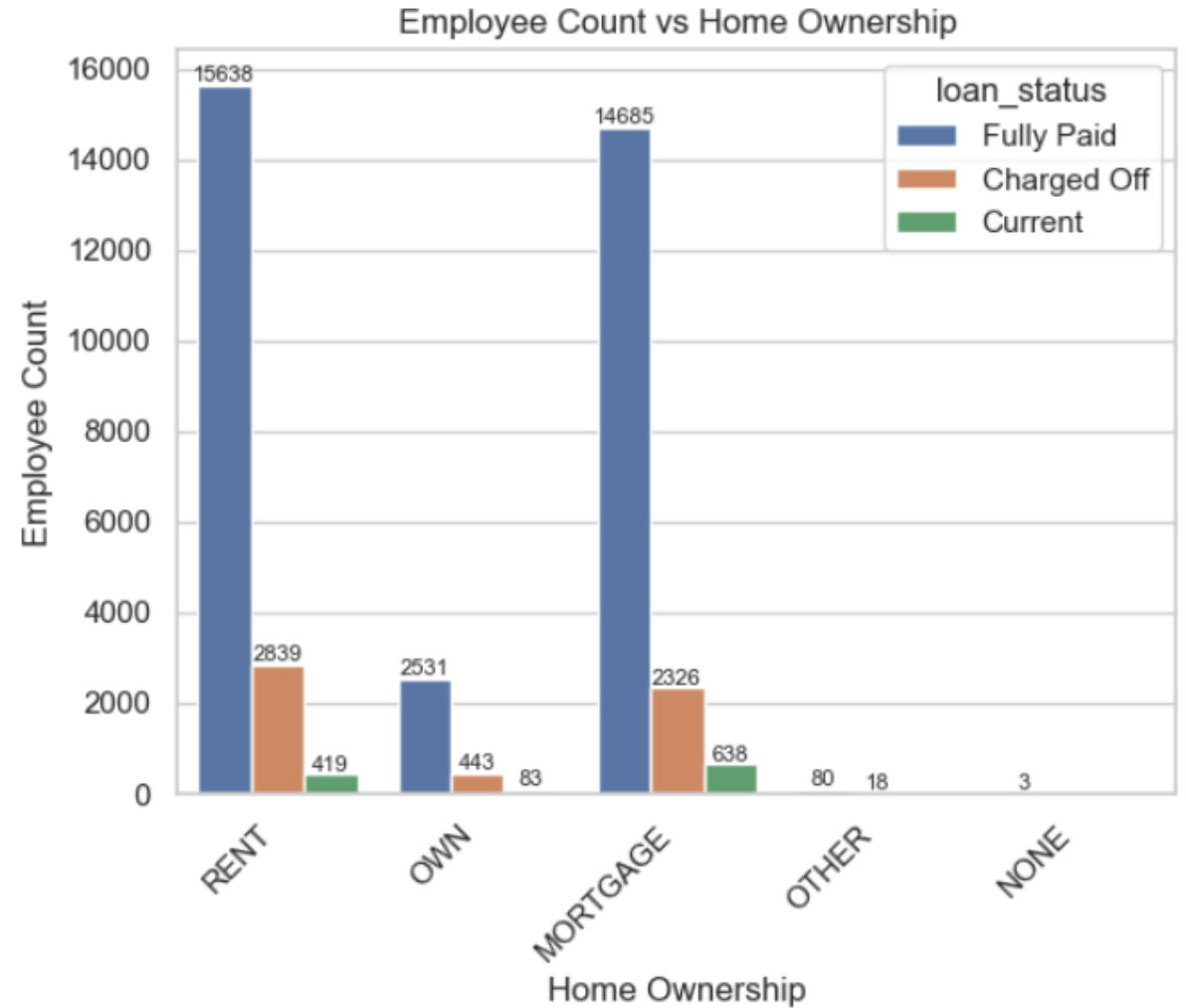# 10. Data Analysis: Employee Count by Purpose of Loan and Loan Status

Insight:

Debt consolidation purpose have the most no. of defaulters

11. Data Analysis: Employee Count by Home Ownership and Loan Status

Insight:

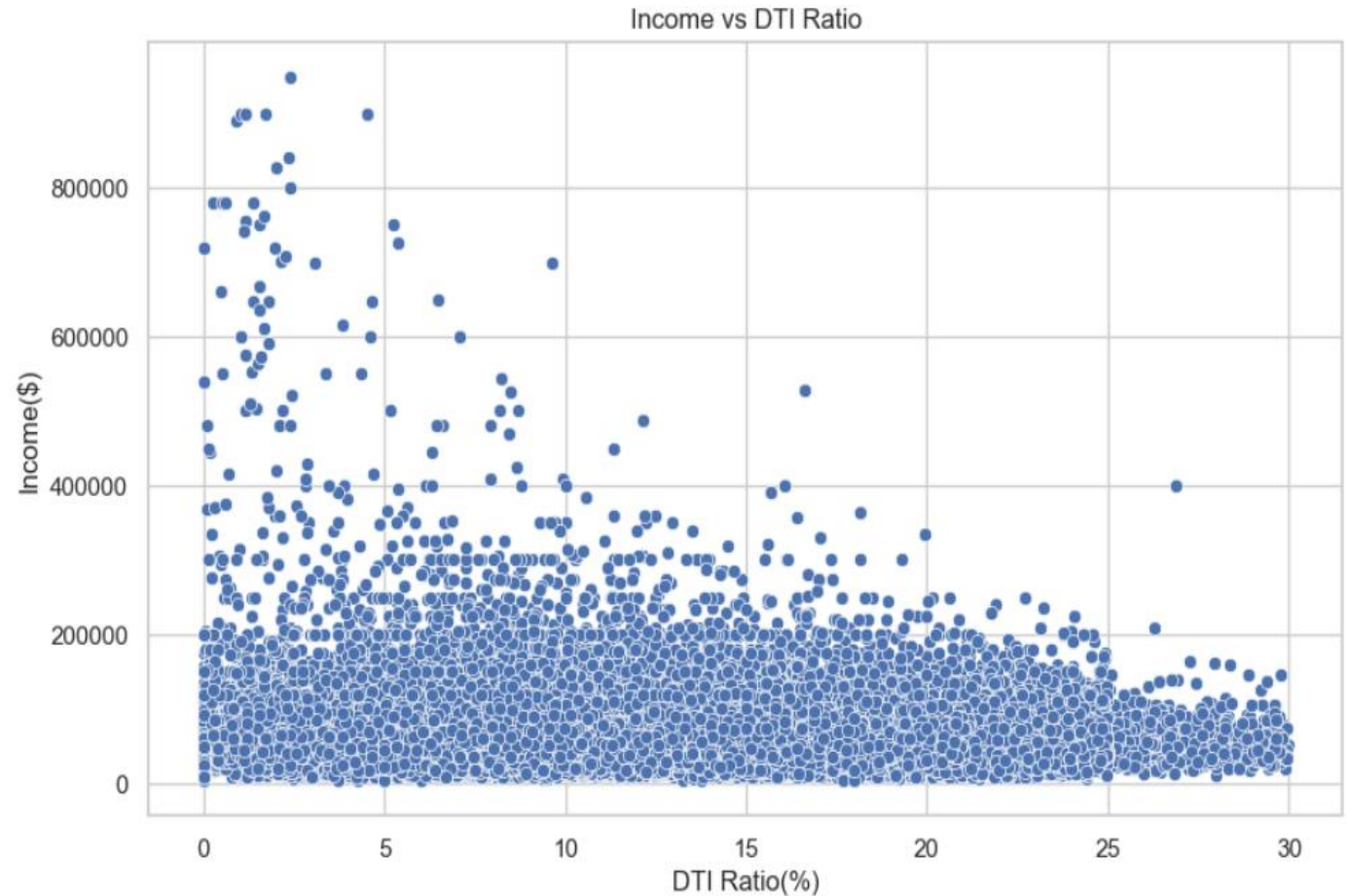Rent / Mortgage have more tendency to be defaulters as compare to Own.

12. Data Analysis: DTI Ratio(%) vs Income($)

Insights:

1. DTI Ratio varies as per income, DTI Ratio increases as Income decreases.

2. A higher ratio indicates that a borrower has a significant amount of existing debt relative to their income, which imposes risk to lender.

Income vs DTI Ratio

Conclusion

On the basis of our analysis following are the potential variables which can predict the defaulters.

1. Loan Purpose
2. Term
3. Grade
4. Revolving Line Utilization Rate
5. Public Record of bankruptcy
6. Verification Status
7. Home Ownership

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