

Lending Club Case Study

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Objective & Goal

Objective :

To identify the risky loan applicants, reduce loans given to such persons and thereby cutting down the amount of credit loss.

Goals :

Understand the driving factors (or driver variables) behind loan default, i.e., the variables which are strong indicators of default.

Overall Loan Status Statistics

On a total, 14% of the loans are being charged-off i.e., getting defaulted.

Loan status	Values	Percentage
Fully Paid	32113	86%
Default	5384	14%
Total	37497	100%

Impact Variables

S.No	Variable Name	Description	Difference between Default Loan Percentage between different groups
1	int_rate	Interest Rate on the loan	34.4%
2	grade	LC assigned loan grade	27.3%
3	pub_rec_bankruptcies	Number of public record bankruptcies	26.0%
4	pub_rec	Number of derogatory public records	22.4%
5	home_ownership	The home ownership status provided by the borrower during registration	18.8%
6	purpose	A category provided by the borrower for the loan request.	16.9%
7	annual_inc	The self-reported annual income provided by the borrower during registration.	16.7%
8	term	The number of payments on the loan. Values are in months and can be either 36 or 60.	14.3%

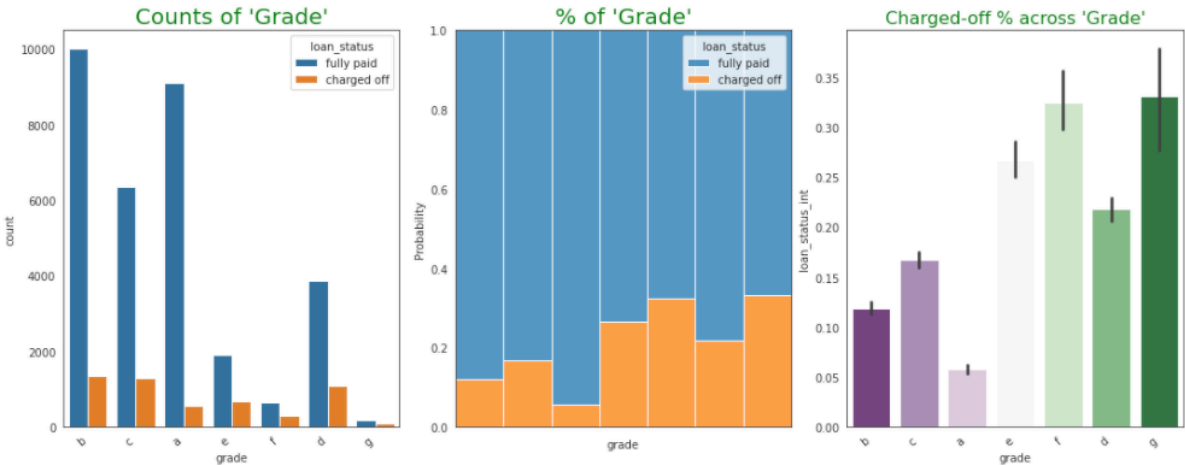
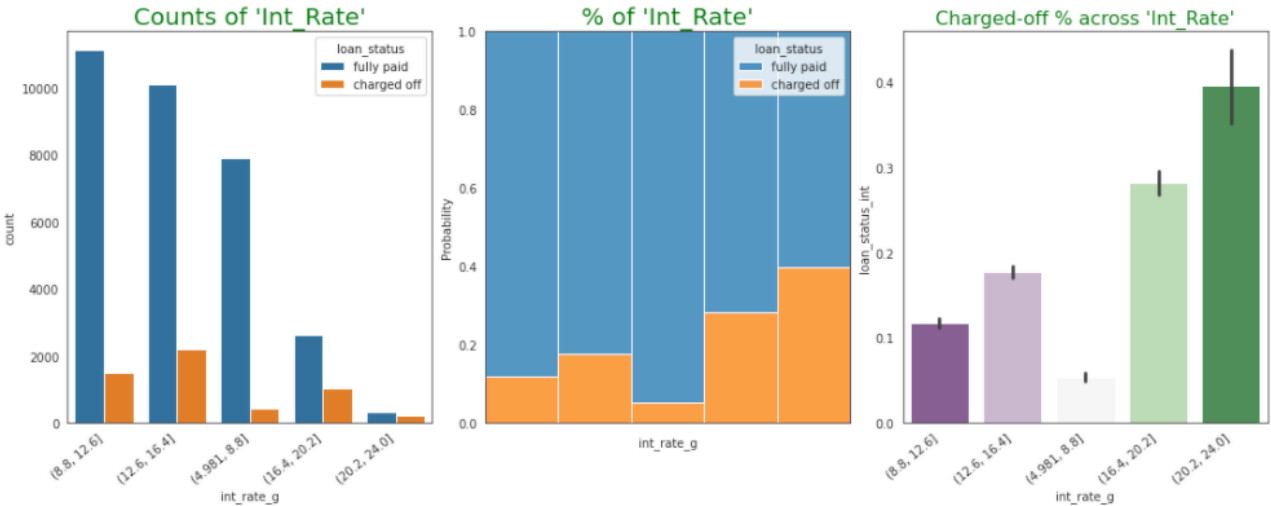
Loan Status against Interest Rate and Grade

loan_status	charged off	fully paid
int_rate_g		
(12.6, 16.4]	17.82	82.18
(16.4, 20.2]	28.25	71.75
(20.2, 24.0]	39.74	60.26
(4.981, 8.8]	5.39	94.61
(8.8, 12.6]	11.83	88.17

loan_status	charged off	fully paid	Total
int_rate_g			
(12.6, 16.4]	2195	10122	12317
(16.4, 20.2]	1031	2618	3649
(20.2, 24.0]	213	323	536
(4.981, 8.8]	451	7916	8367
(8.8, 12.6]	1494	11134	12628
Total	5384	32113	37497

loan_status	charged off	fully paid
grade		
a	5.78	94.22
b	11.93	88.07
c	16.78	83.22
d	21.80	78.20
e	26.68	73.32
f	32.49	67.51
g	33.11	66.89

loan_status	charged off	fully paid	Total
grade			
a	558	9102	9660
b	1355	10003	11358
c	1285	6372	7657
d	1082	3881	4963
e	696	1913	2609
f	310	644	954
g	98	198	296
Total	5384	32113	37497



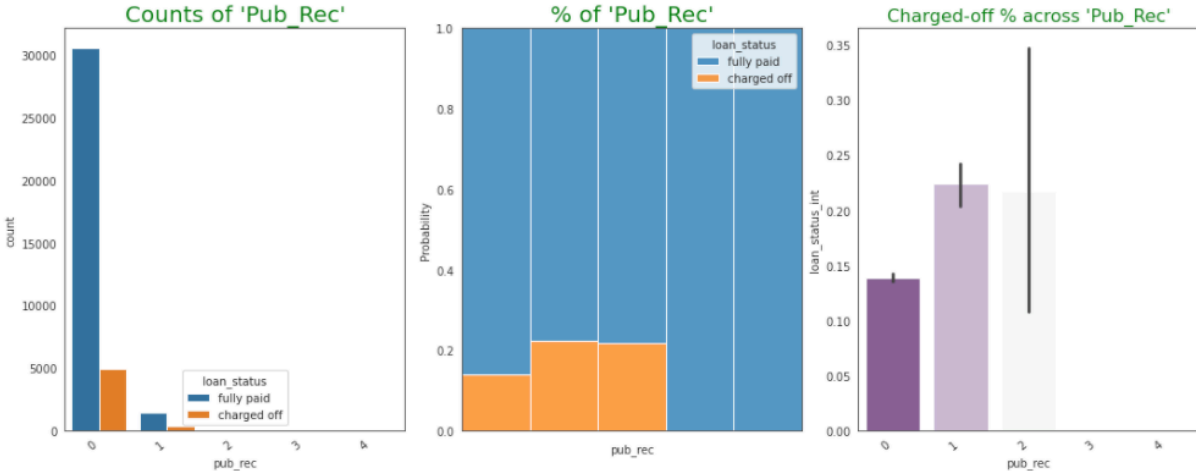
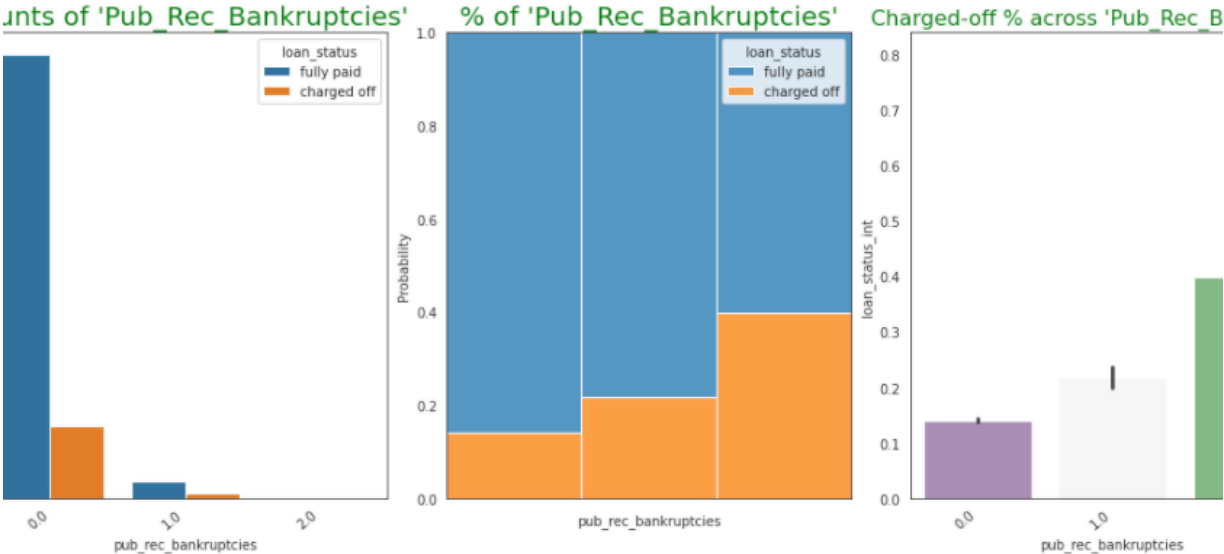
Loan Status against Bankruptcies and Derogatory Remarks

s	charged off	fully paid	Total
ankruptcies			
0.0	5047	30916	35963
1.0	335	1194	1529
2.0	2	3	5
Total	5384	32113	37497

loan_status	charged off	fully paid
pub_rec_bankruptcies		
0.0	14.03	85.97
1.0	21.91	78.09
2.0	40.00	60.00

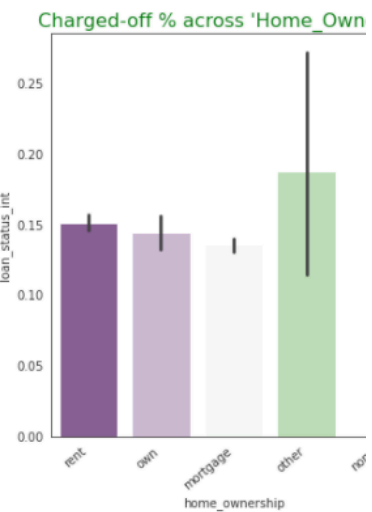
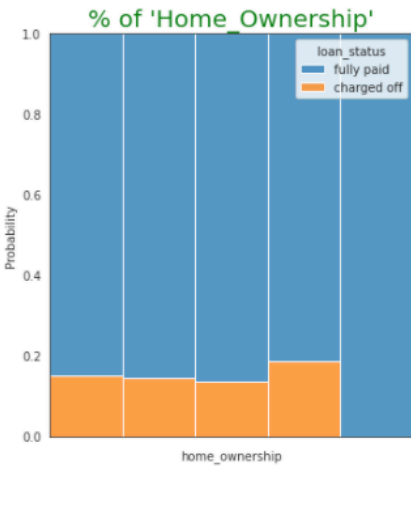
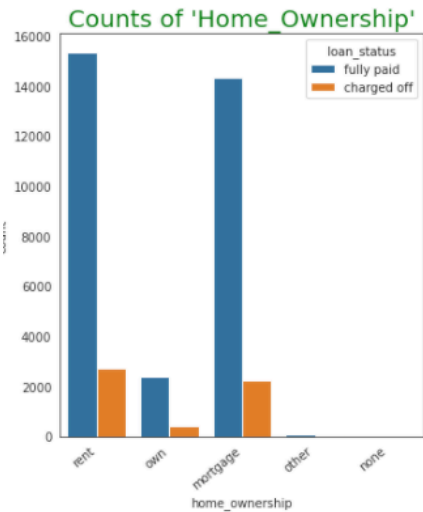
loan_status	charged off	fully paid	Total
pub_rec			
0	4950	30598	35548
1	424	1470	1894
2	10	36	46
3	0	7	7
4	0	2	2
Total	5384	32113	37497

loan_status	charged off	fully paid
pub_rec		
0	13.92	86.08
1	22.39	77.61
2	21.74	78.26
3	0.00	100.00
4	0.00	100.00

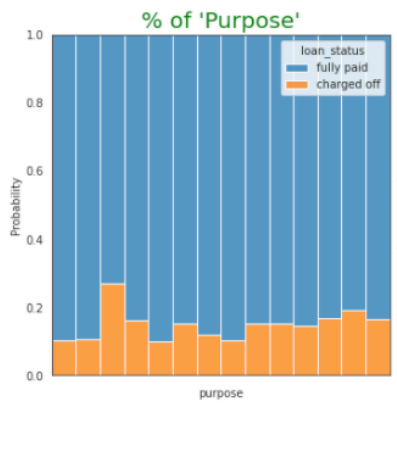
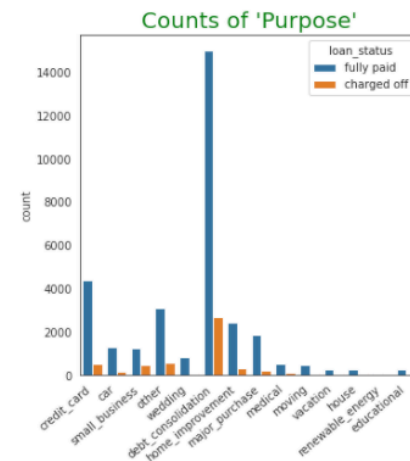


Loan Status against Home Ownership and Purpose

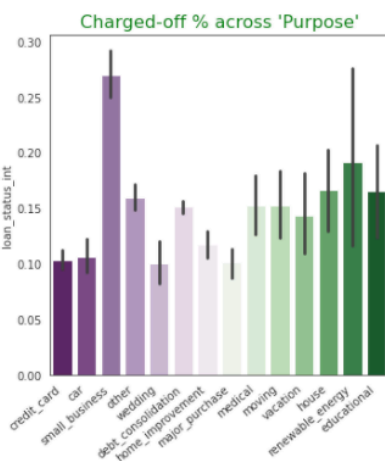
loan_status	charged off	fully paid	Total
home_ownership			
mortgage	2242	14344	16586
none	0	3	3
other	18	78	96
own	398	2367	2765
rent	2726	15321	18047
Total	5384	32113	37497



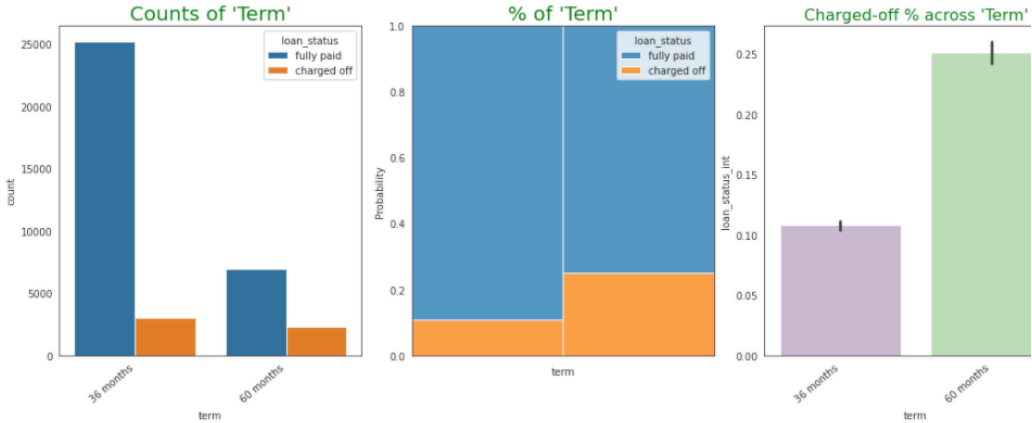
house	59	295	354
major_purchase	210	1864	2074
medical	100	554	654
moving	84	466	550
other	592	3108	3700
renewable_energy	18	76	94
small_business	462	1247	1709
vacation	50	297	347
wedding	92	820	912
Total	5384	32113	37497



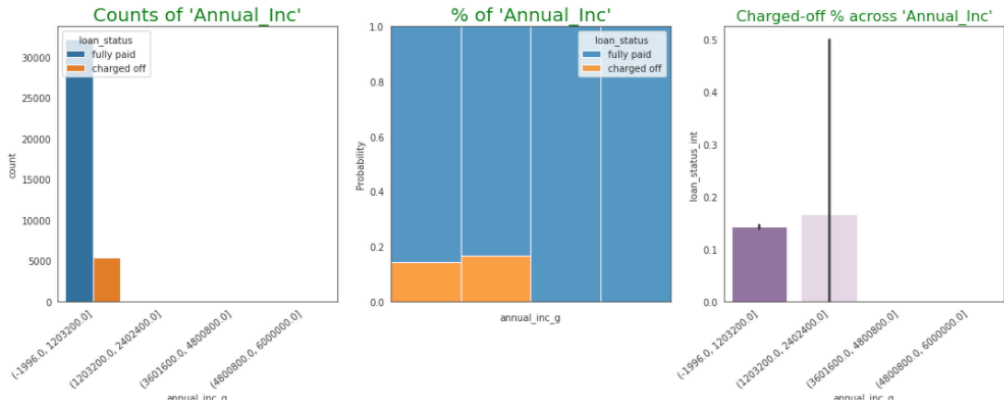
loan_status	charged off	fully paid
purpose		
car	10.65	89.35
credit_card	10.39	89.61
debt_consolidation	15.14	84.86
educational	16.56	83.44
home_improvement	11.79	88.21
house	16.67	83.33
major_purchase	10.13	89.87
medical	15.29	84.71
moving	15.27	84.73
other	16.00	84.00
renewable_energy	19.15	80.85
small_business	27.03	72.97
vacation	14.41	85.59
wedding	10.09	89.91



loan_status	charged off	fully paid	Total
term			
36 months	3061	25182	28243
60 months	2323	6931	9254
Total	5384	32113	37497



annual_inc_g			
(-1996.0, 1203200.0]	5383	32106	37489
(1203200.0, 2402400.0]	1	5	6
(3601600.0, 4800800.0]	0	1	1
(4800800.0, 6000000.0]	0	1	1
Total	5384	32113	37497



loan_status	charged off	fully paid
term		
36 months	10.84	89.16
60 months	25.10	74.90

loan_status	charged off	fully paid
annual_inc_g		
(-1996.0, 1203200.0]	14.36	85.64
(1203200.0, 2402400.0]	16.67	83.33
(3601600.0, 4800800.0]	0.00	100.00
(4800800.0, 6000000.0]	0.00	100.00

Loan Status against Term and Annual Income

Primary Recommendations

Below recommendations are given when
Default rate is set not to breach 22% :

1. Not to give loans having interest rates between 16 – 24 %.
2. Not to give loans having term as 60 months.
3. Not to give loans for the grades D, E, F and G
4. Not to give loans with purpose as 'Small Business'
5. Not to give loans when the requestor is having bankruptcies or having one or two derogatory remarks.

VARIABLE	VALUE	DEFAULT RATE
Interest Rate	16% - 20%	28%
	20% - 24 %	40%
Term	60 Months	25%
Grades	D	22%
	E	27%
	F	32%
	G	33%
Purpose	Small Business	27%
Bankruptcies	1	22%
	2	40\$
Derogatory Remarks	1 or 2	22%

Additional Recommendations - II

Below recommendations need to be followed when Default rate is set not to breach 50%.

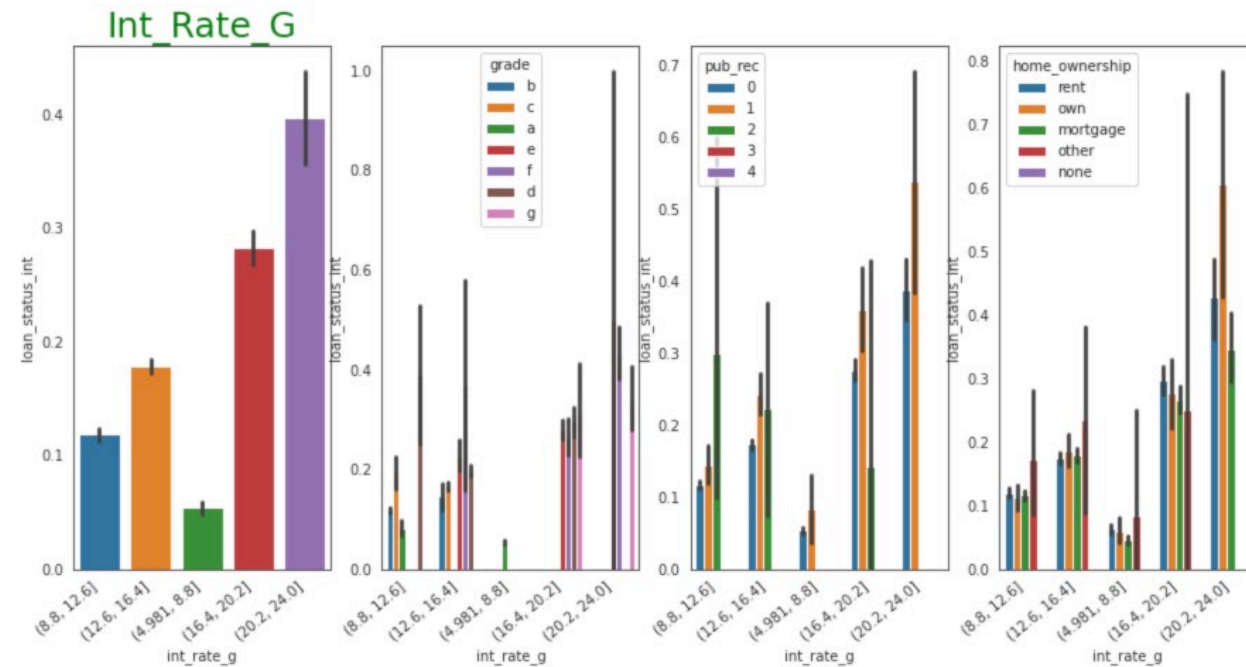
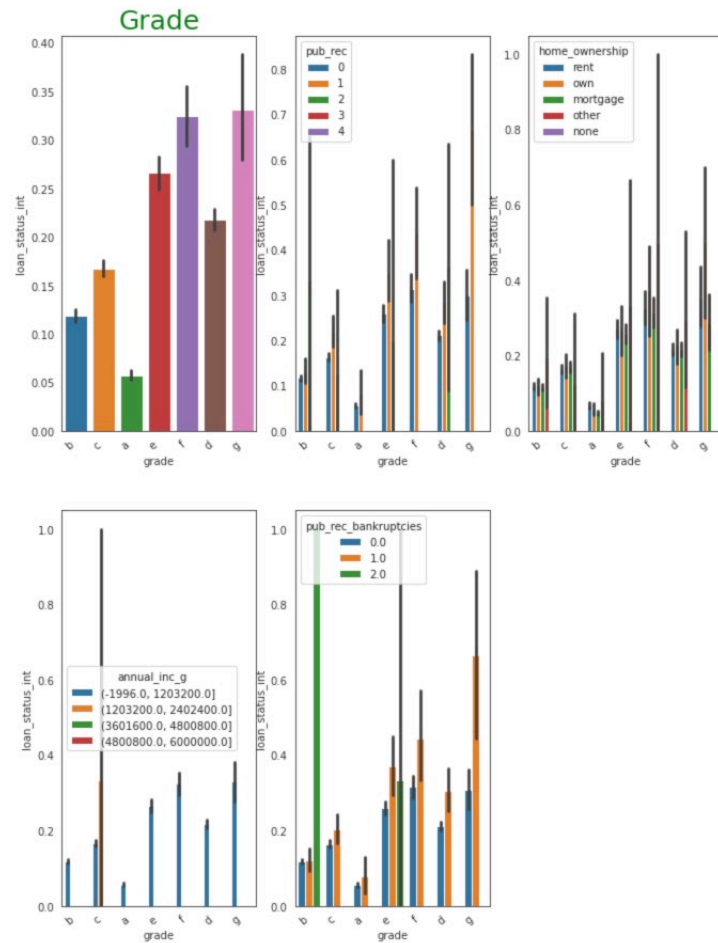
INDEPENDENT VARIABLE	VALUE	DEPENDENT VARIABLE	VALUE	DEFAULT RATE
Interest Rate	16% - 20%	Grade	E	50%
Interest Rate	20% - 24%	Derogatory Remarks	1	53%
Interest Rate	20% - 24%	Home Ownership	Own	60%
Interest Rate	16% - 20%	Purpose	Educational	66.7%
Interest Rate	20% - 24%	Purpose	Educational	66.7%
Interest Rate	20% - 24%	Purpose	House	50%
Interest Rate	16% - 20%	Purpose	Medical	57.1%
Interest Rate	16% - 20%	Purpose	Small Business	52.7%
Interest Rate	16% - 20%	Bankruptcies	1	54.8%

INDEPENDENT VARIABLE	VALUE	DEPENDENT VARIABLE	VALUE	DEFAULT RATE
Grade	G	Derogatory Remarks	1	66.7%
Grade	F	Home Ownership	Other	50%
Grade	G	Home Ownership	Own	50%
Grade	G	Purpose	Car	50%
Grade	G	Purpose	House	50%
Grade	G	Purpose	Medical	66.67%
Grade	G	Bankruptcies	1	66.67%

INDEPENDENT VARIABLE	VALUE	DEPENDENT VARIABLE	VALUE	DEFAULT RATE
Term	60 Months	Home Ownership	Other	100%
Term	60 Months	Annual Income	12L - 24L	100%
Derogatory Remarks	1	Home Ownership	Other	66.67%
Derogatory Remarks	2	Purpose	Credit Card	66.67%
Derogatory Remarks	2	Purpose	Medical	50%
Home Ownership	Other	Purpose	Car	50%

Additional Recommendations – II (Continued)

- Below graphs shows the additional recommendations given for Interest and Grade variables



Additional Recommendations – II (Continued)

- Below graphs shows the additional recommendations given for Term and Derogatory Remarks variables

