

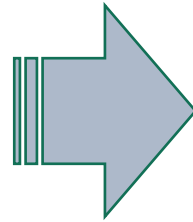


# *LENDING CLUB CASE STUDY*

AMANDEEP MINHAS  
ARUN VINCENT J A

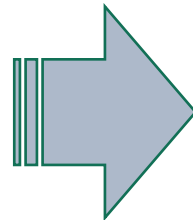
# PROBLEM

COMPANY  
PROFILE



Lending Club is the largest online loan marketplace, facilitating personal loans, business loans, and financing of medical procedures.

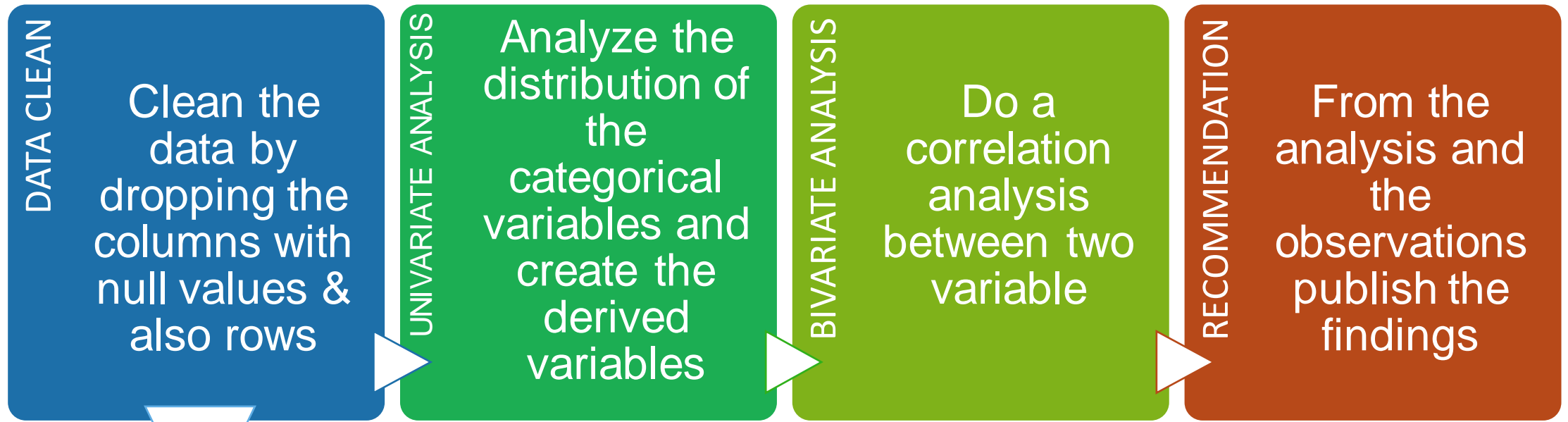
PROBLEM



Lending Club wants to understand the driving factors behind loan default, i.e. the driver variables which are strong indicators of default.

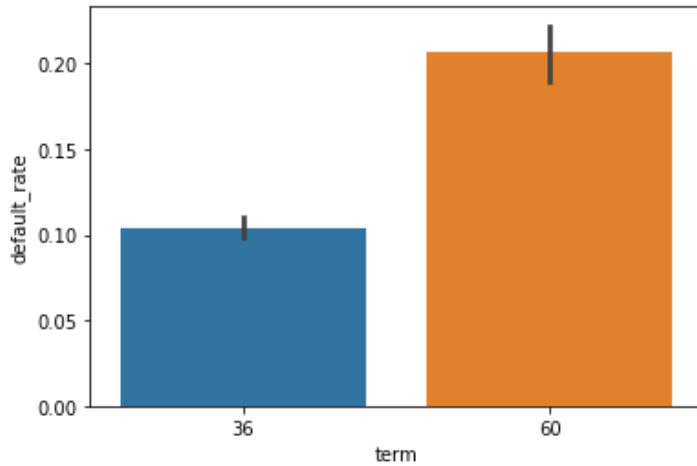
So as a data scientist working for Lending Club, we have to analyze the dataset containing information about past loan applicants using EDA to understand how consumer attributes and loan attributes influence the tendency of defaulters.

# APPROACH



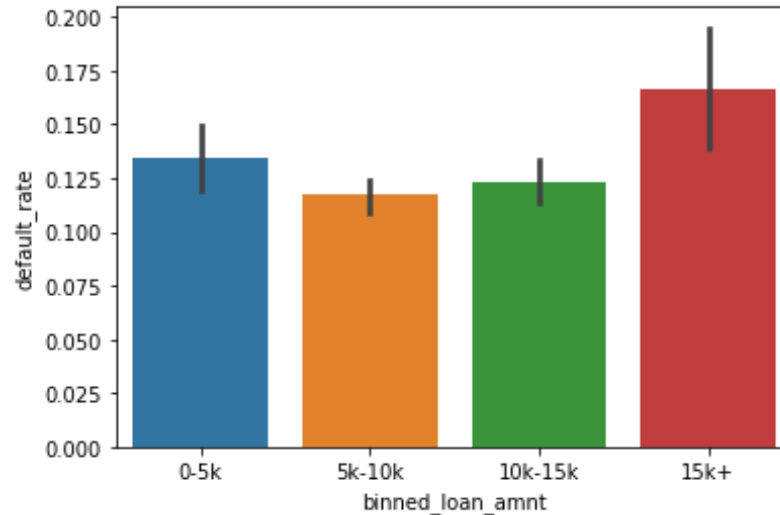
- Retain Columns that store information that is collected before loan is granted
- Drop columns that have all nulls or all unique values
- Derive a new column `default_rate` to be 0 (Not Defaulted) or 1 (Defaulted)
- Drop outlier values for Annual Income, Loan Amount and Interest Rate

# ANALYSIS



## TERM ANALYSIS

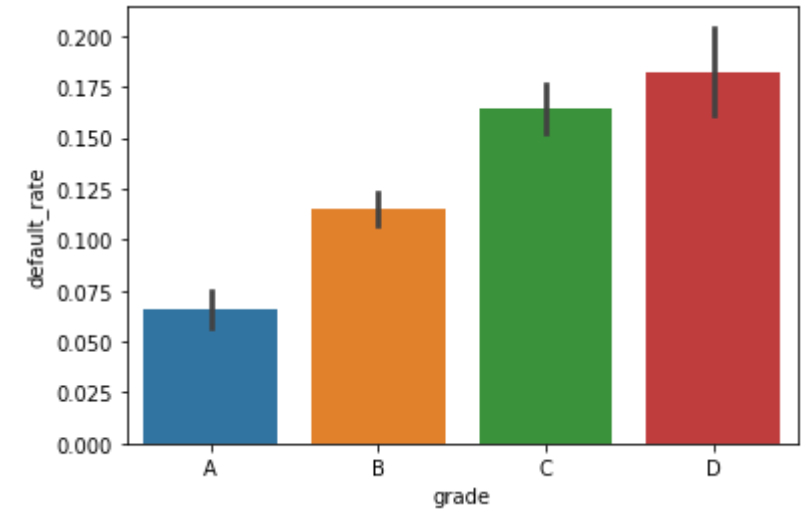
Months	36	60
Default Rate	10%	21%



## LOAN AMOUNTS ANALYSIS

13% of the customers who borrow less than 5k tend to default.

LOW RISK	HIGH RISK
12% in 5k - 10k	17 % above 15 k
12% in 10k - 15k	

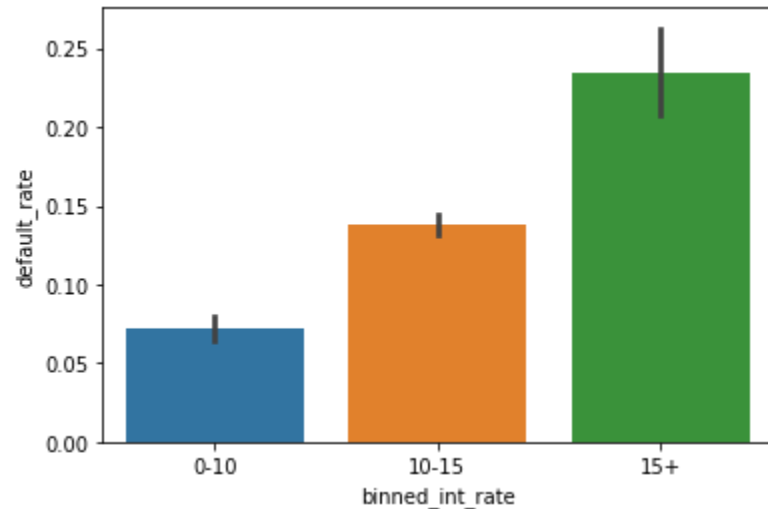


## GRADE ANALYSIS

As grade increases, the risk increases

LOW RISK	HIGH RISK
A (~7%)	D (~18%)

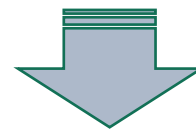
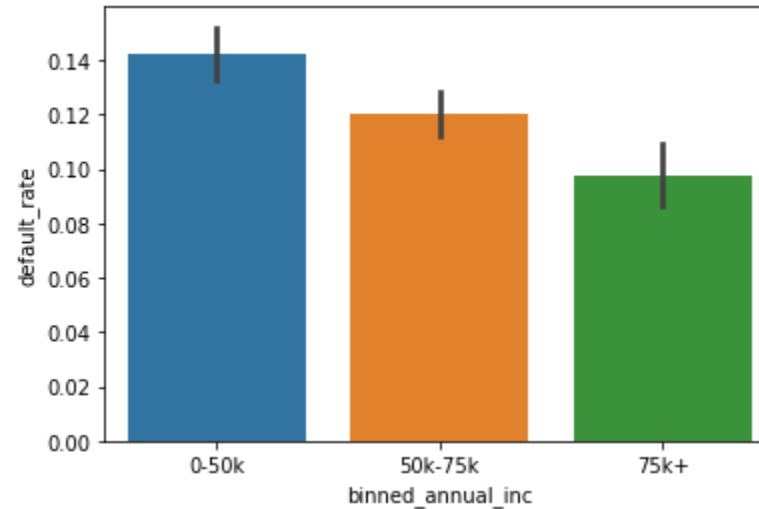
# ANALYSIS



## INTEREST RATE ANALYSIS

As interest rate increases, the default rate also increases

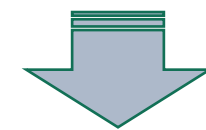
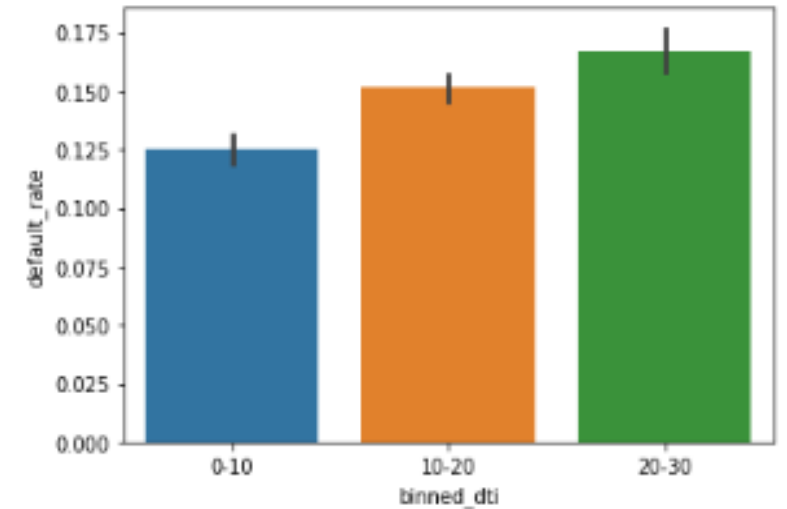
	LOW	MEDIUM	HIGH
Interest Rate	7%	14%	23%
Default Rate	<10%	10%-15%	>15%



## ANNUAL INCOME ANALYSIS

As income increases, the chances of customer defaulting decreases.

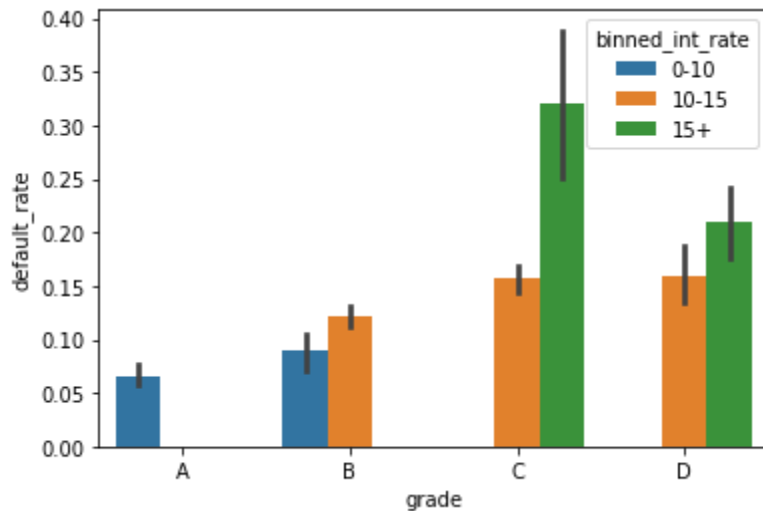
<50K	50K-75K	>75K
14%	12%	10%



## DTI ANALYSIS

As DTI increases, the tendency to default increases

# ANALYSIS



## INTEREST RATE | GRADE

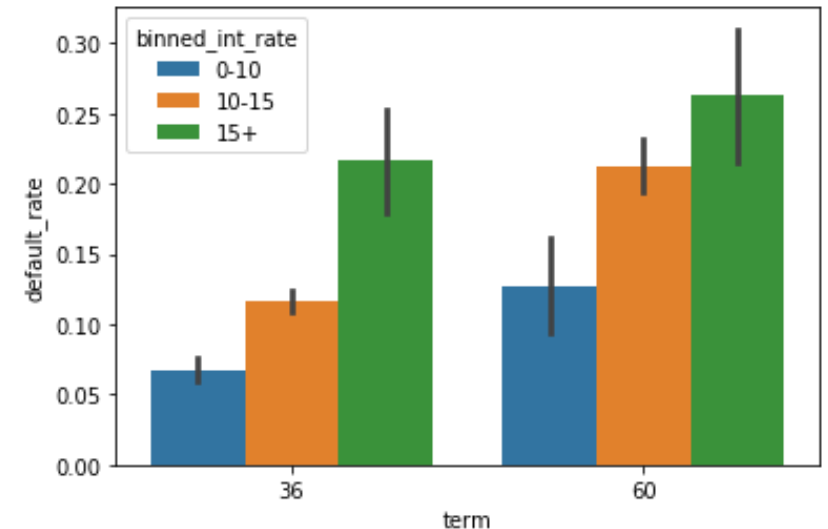
**Lowest Risk** → Chances of default are minimum for loans given out at interest rate of less than 10% to customer with Grade A. (7%)

**Highest Risk** → Chances of default are maximum for loans given out at interest rate of more than 15% to customer with Grade C. (32%)

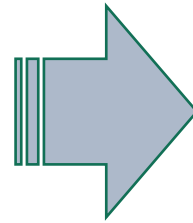
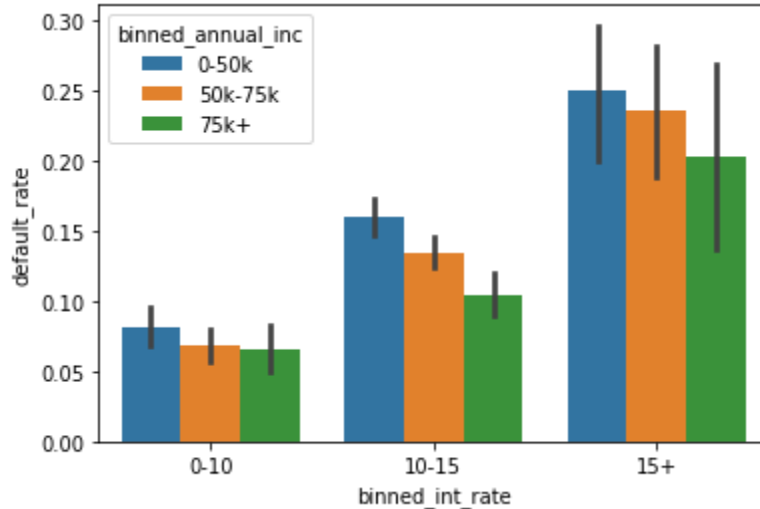
## INTEREST RATE | TERM

**Lowest Risk** → Chances of default are minimum when granting a loan for tenure of 36 months with interest rate of less than 10% (7%)

**Highest Risk** → Chances of default are maximum when granting a loan for tenure of 60 months with interest rate of more than 15% (26%).



# ANALYSIS



## INTEREST RATE | ANNUAL INCOME

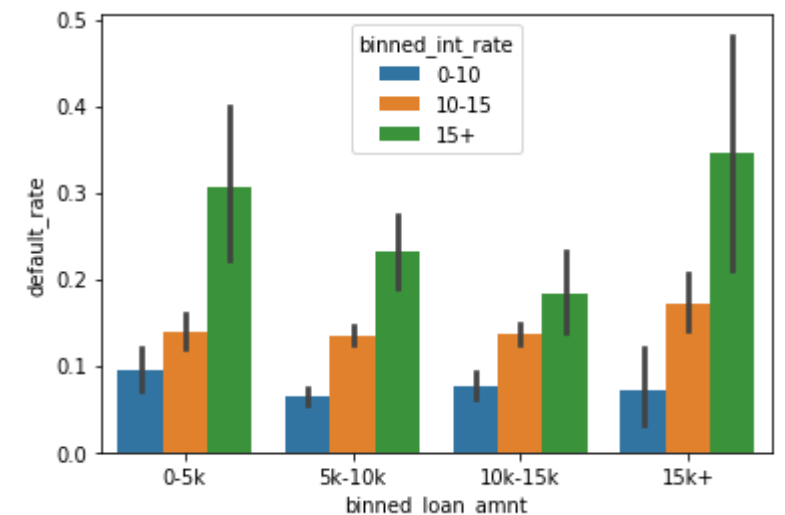
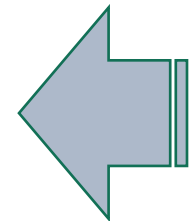
**Lowest Risk** → Chances of default are minimum (~7%) for loans given out at an interest rate of less than 10% to customers with annual income of more than 75k

• **Highest Risk** → Chances of default are maximum (~25%) for loans given out at an interest rate of more than 15% to customers with annual income of less than 50k

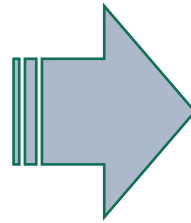
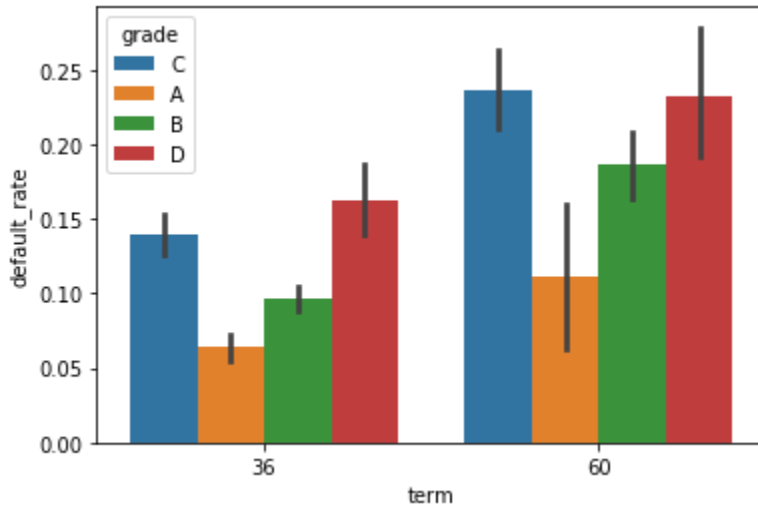
## INTEREST RATE | LOAN AMOUNT

**Lowest Risk** → Chances of default are minimum for a loan of over 5k-10k with interest rate of less than 10% (6%).

**Highest Risk** → Chances of default are maximum for a loan of over 15k with interest rate of more than 15% (35%).



# ANALYSIS



## GRADE | TERM

**Lowest Risk** → Chances of default are minimum when giving out loan to customer with A grade for a term of 36 months (~6%)

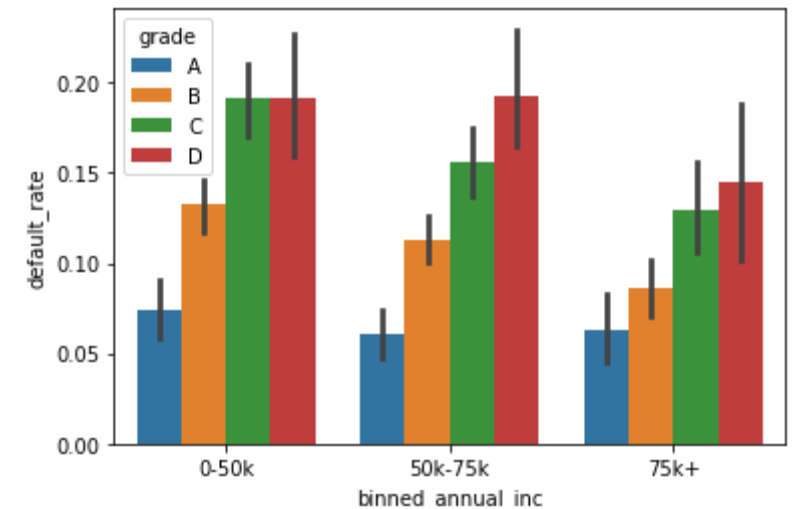
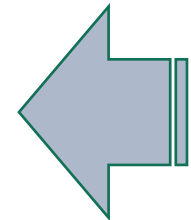
**Highest Risk** → Chances of default are maximum when giving out loan to customer with C grade for a term of 60 months (~24%)

## Grade | Annual Income

**Lowest Risk** → Chances of default are minimum when granting loans to customers with annual income of 50k - 75k and with grade A (~1%)

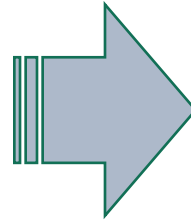
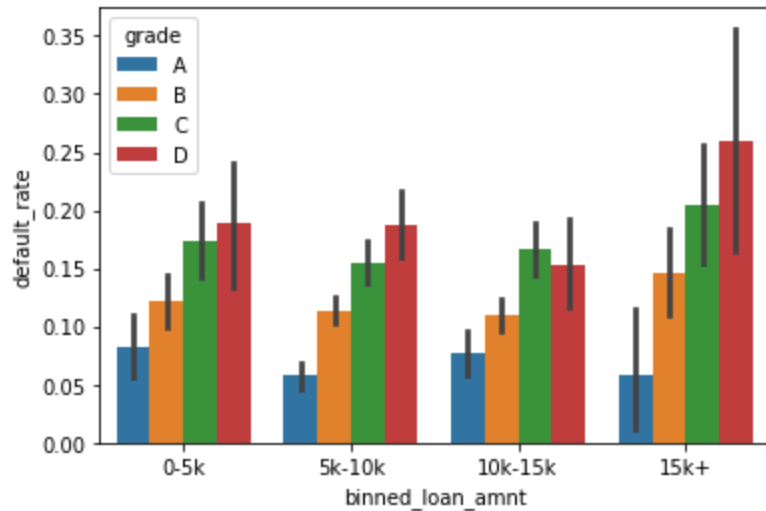
**Highest Risk** → Chances of default are maximum when granting loans to

- customers with annual income of less than 50k and with grade C or D (~19%)
- customers with annual income of 50k-75k and with grade D (~19%)





# ANALYSIS



## GRADE | LOAN AMOUNT

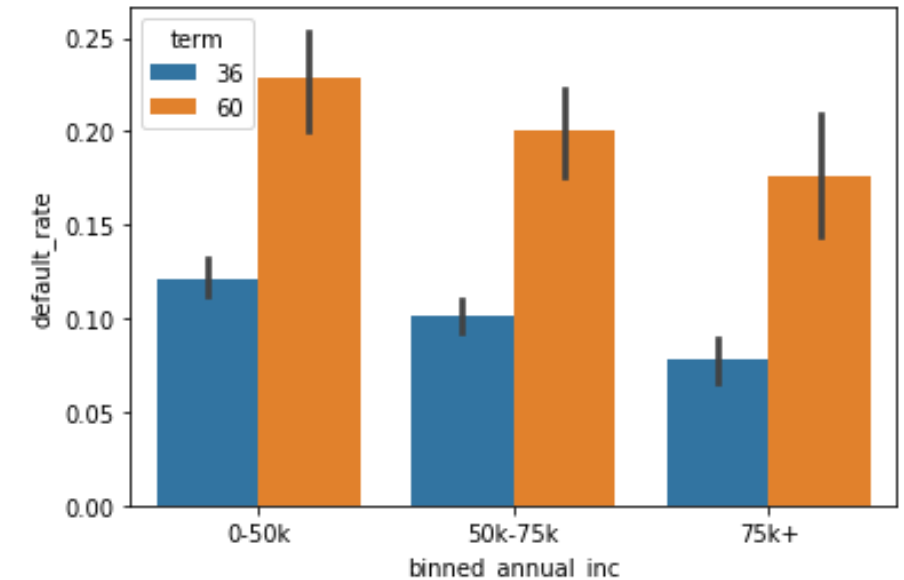
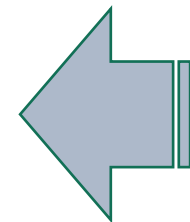
**Lowest Risk** → Chances of default are minimum when granting loan of 5k - 10k to customers with grade A (~6%)

**Highest Risk** → Chances of default are maximum when granting loan of more than 15k to customers with grade D (~26%)

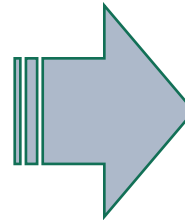
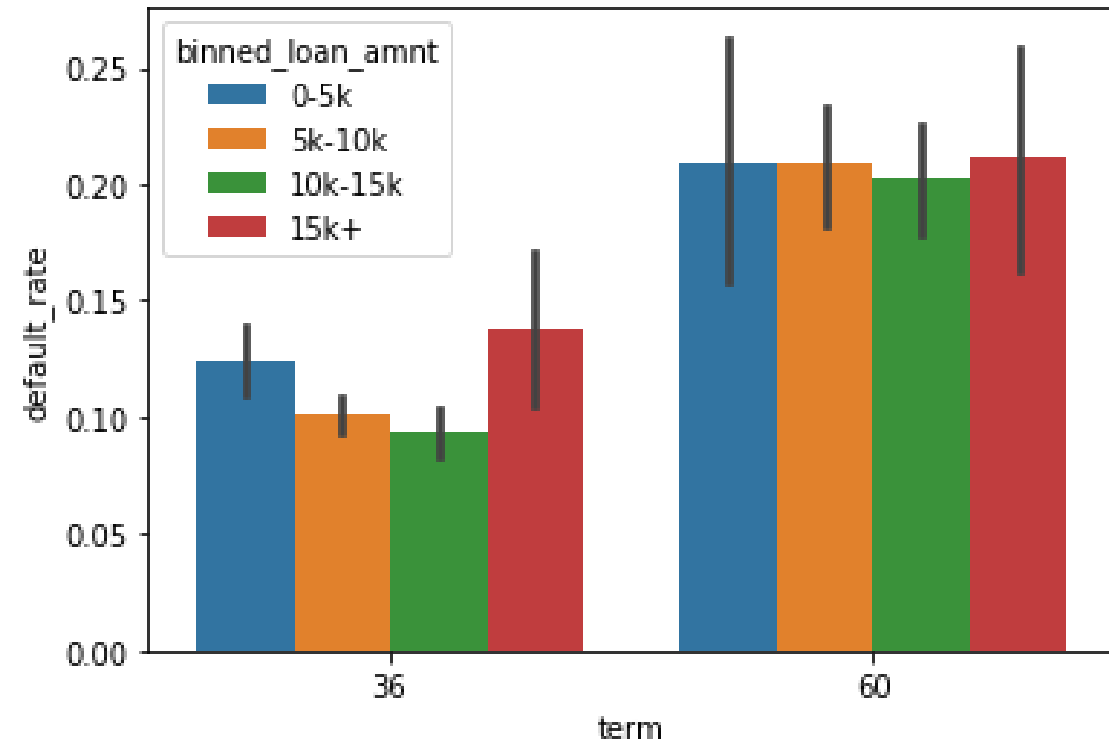
## TERM | ANNUAL INCOME

**Lowest Risk** → Chances of default are minimum when giving out a loan to a customer with annual income of 75k+ for a term of 36 months (~8%)

**Highest Risk** → Chances of default are maximum when giving out a loan to a customer with annual income of less than 50k for a term of 60 months (23%)



# ANALYSIS



## Term | Loan Amount

Loans given for USD 10-15k tend to do better and have less change of defaulting.

### For 36 months

- chances of default are minimum for loans ranging between 10k to 15k. (~9%)
- chances of default are maximum for loan of more than 15k. (14%)

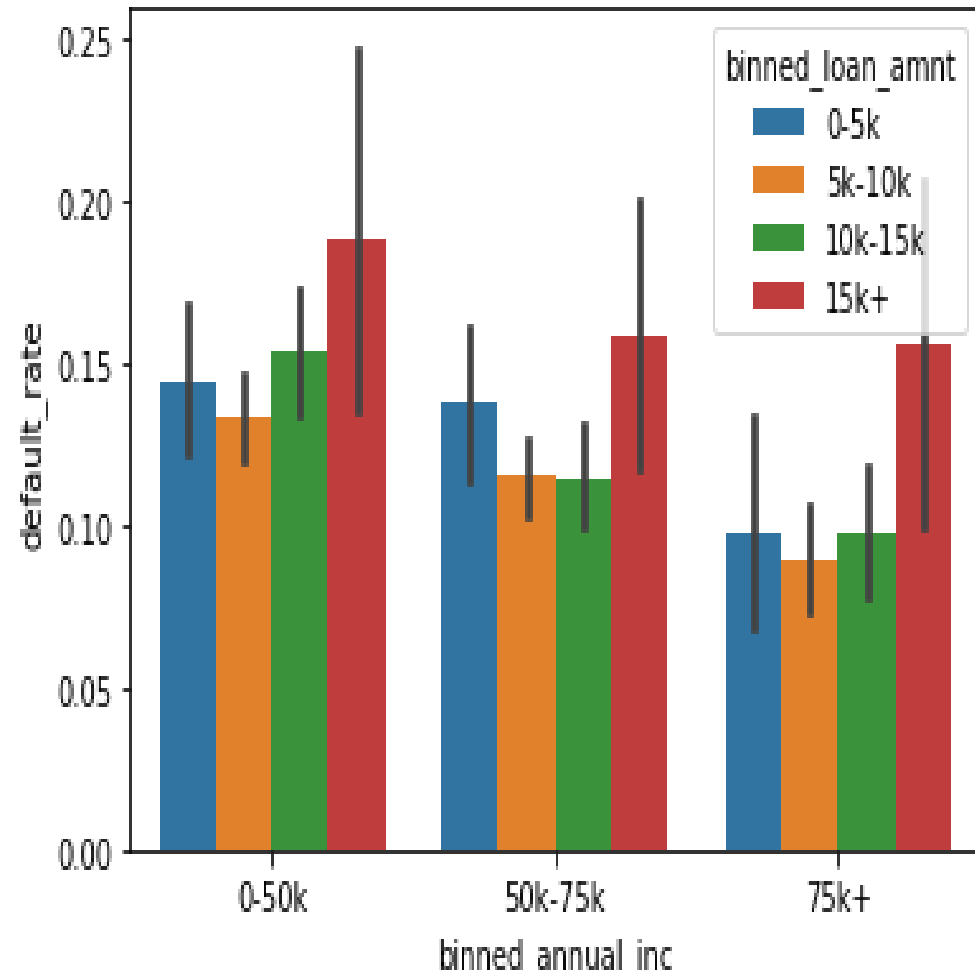
### For 60 months

- chances of default are minimum for loans ranging between 10k to 15k. (~20%)
- chances of default of all others loan amounts are 21%

### Overall

- **Lowest Risk** Chances of default are minimum when giving out loan in the range of USD 10k to 15k for a term of 36 months (~9%)
- **Highest Risk** Chances of default are maximum when giving out loan for any amount for a term of 60 months

# ANALYSIS



## Loan Amount | Annual Income

### For Income 0-50k

- chances of default are minimum for loans ranging between 5k to 10k. (~13%)
- chances of default are maximum for loans greater than 15k. (19%)

### For Income 50k-75k

- chances of default are minimum for loans ranging between 5k to 15k. (~11%)
- chances of default are maximum for loans greater than 15k. (16%)

### For Income 75k+

- chances of default are minimum for loans ranging between 5k to 19k. (~9%)
- chances of default are maximum for loans greater than 15k. (16%)

**Lowest Risk** → chances of default are minimum for loans ranging between 5k to 10k granted to customer with income of greater than 75k (~9%)

**Highest Risk** → chances of default are maximum for loans greater than 15k granted to customer with income in the range of 0 to 50k (19%)

# RECOMMENDATION

From the tables formulated in the last slide

GOOD LOAN - Loan which has a default rate of less than 8%

BAD LOAN - Loan which has a default rate of more than 30%

Good/Bad	GRADE	TERM	INTEREST RATE	LOAN AMOUNT	ANNUAL INCOME
Good Loan	A	36	less than 10%		
	B		less than 15%	5k -15k	
	C		10% - 15%	less than 5k	above 75k
	D		above 10%	5k -15k	above 75k
Bad Loan	C	60	10% - 15%	above 10k	below 50k
	D	60	above 15%	5k -10k	below 50k

We strongly recommend the club avoid giving loans to the people with combination in the Bad Loan category.

Also we found that there is high chance of not default for people who come under Good Loan category