

# **Lending Club – Bank Loan Analysis**

**Visualizations and Insights using R**

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# Bank Loan Analysis

## APPROACH

As per basic expectations, we have to come up with the analysis as per the business objective. The loan files contains around 74 features, out of which relevant features have to be extracted as per client's demand.

What I observed was that, the LC generates individual report for each registered customer in the form of visualizations in their account, depicting how much have they spent, the loans taken over time, their favorable loan grade and loan purposes, credits,etc.

We have to generate almost same visualizations so as to visualize the trend over lending club site to see the

- Total issued loans till date
- Purpose of loans
- Mostly used loan grade (A to G)
- Understanding on rejection of loans
- Investor performance
- Delinquency rates by each quarter or year
- Interest rates over time and many more..

# Bank Loan Analysis

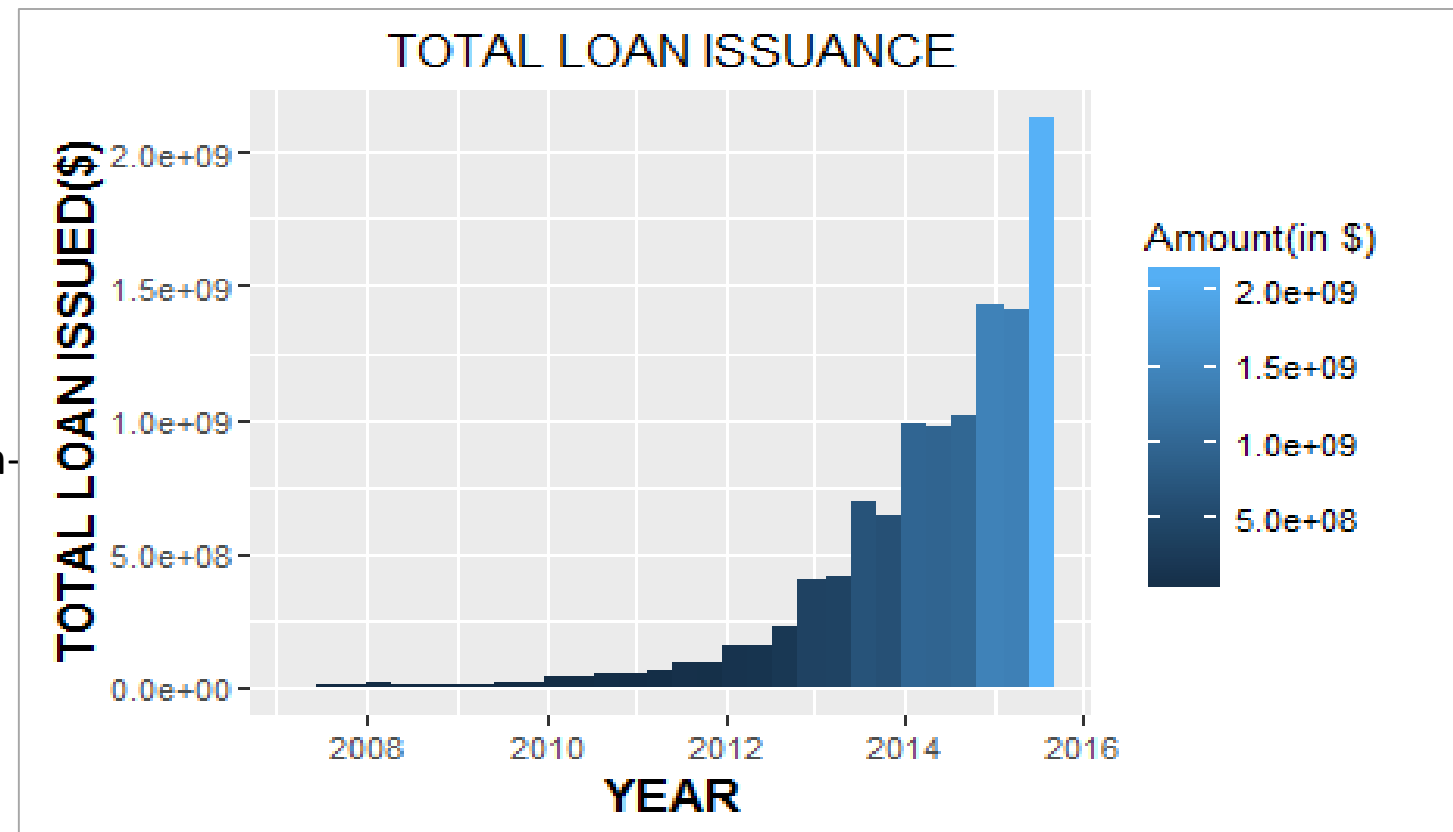
## Visualizations

Hereby, I have included visualizations done on both R and Excel 2013 (powerview). The code of visualizations in R are however shared in the code at the end.

### Expected Outcomes

- ☐ Total Loan issuance by yearly & quarterly and calculate growth rate by quarter on quarter and year on year

Total Loan Issuance as per data is given as **11.12 billion**. The loan issuance increases exponentially every year and the last registered loan is till the 3<sup>rd</sup> quarter of year 2015.



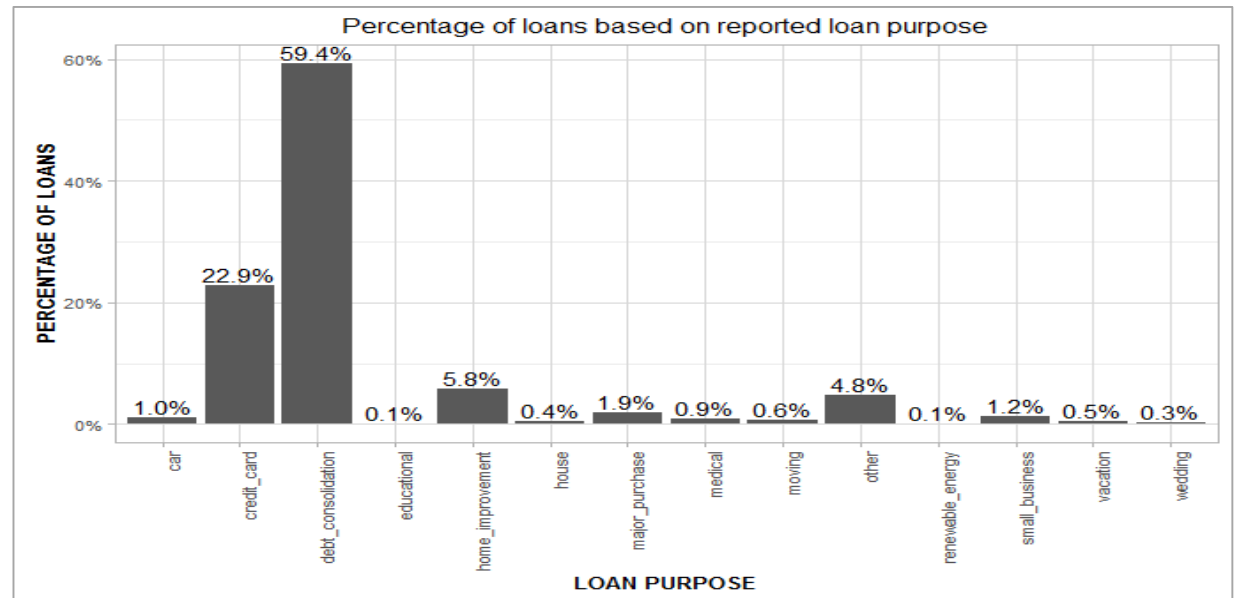
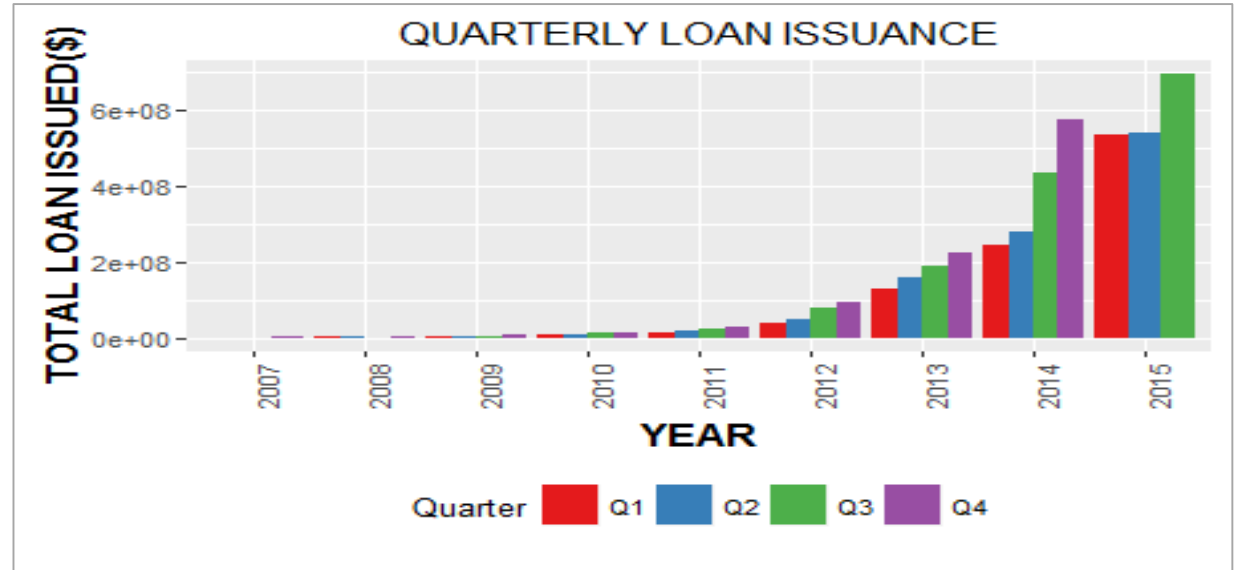
# Bank Loan Analysis

The loans issued in last quarter was around **1.7 billion (\$)**. Moreover, every quarter shows significant rise in the loans issued. We can see that, for every year  $Q4 > Q3 > Q2 > Q1$ .

## ❑ Percentage of loans based on reported loan purpose

Most loans have been issued regarding **debt consolidation** with around 59% as compared to other purposes.

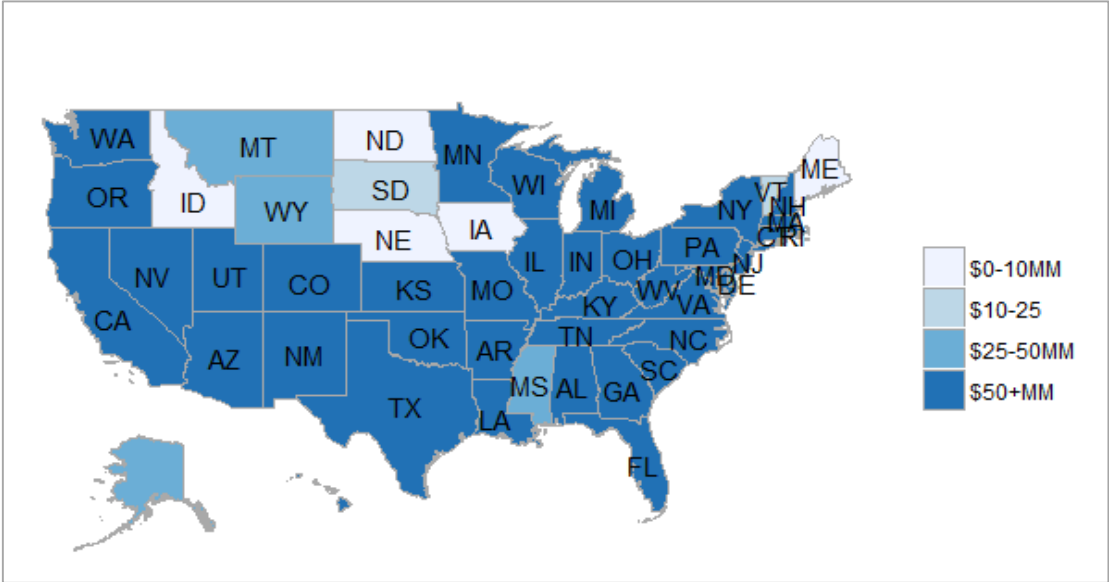
Subsequent most popular cases of loans are due to **credit card(22.9%)** and **home improvement(5.8%)**.



# Bank Loan Analysis

## ❑ Loan Issuance by state

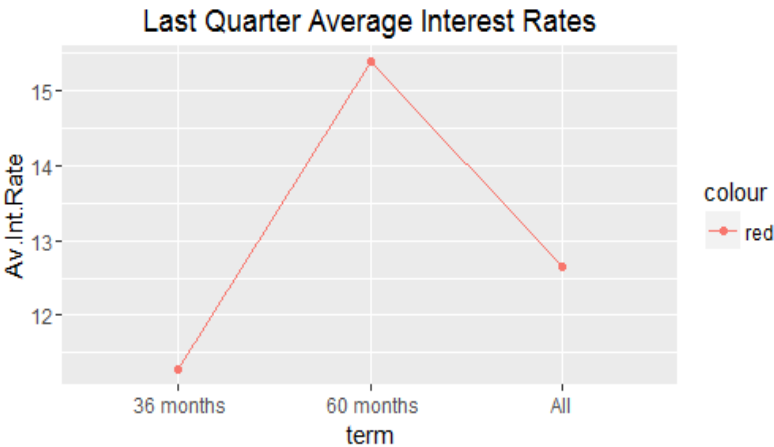
Among 52 states in US, almost 85% of states in US have loan issuance of more than \$50+ Million.  
Maine, Idaho, Iowa, Nebraska and North Dakota are few of the states which have very less loan issuance (between 0-10\$ million). This shows that the people in these areas are perhaps not open to loans exchanges over LC or they mark the poorer section of the society.



## ❑ Find the last quarter average interest rates by different term loans and overall

	term	Av.Int.Rate
1	36 months	11.28402
2	60 months	15.39672

The average interest rate for the loan term of 36 months is around 11.28% which is lesser than for 60 months term (15.39%). Hence, investors are more likely to invest for loans having 36months loan terms



# Bank Loan Analysis

## ❑ Find the historical returns by loan grade

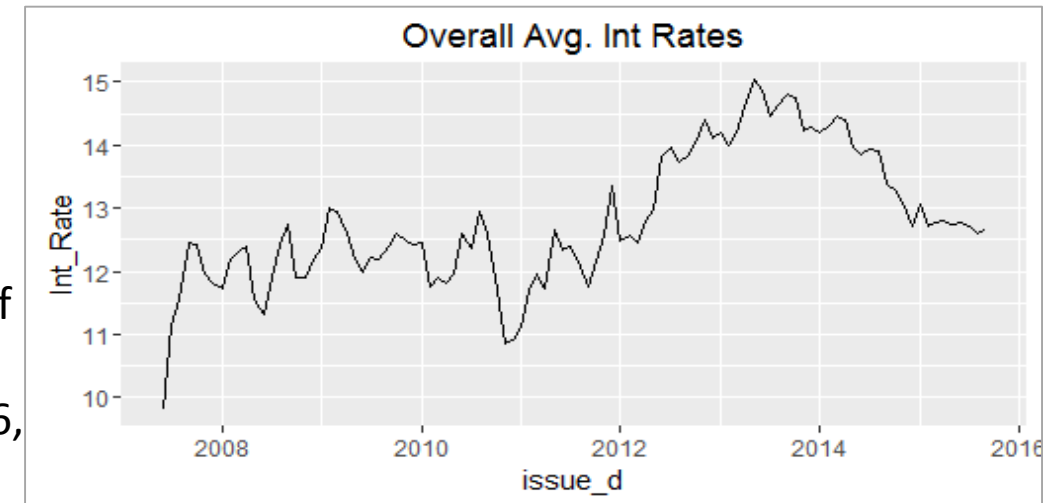
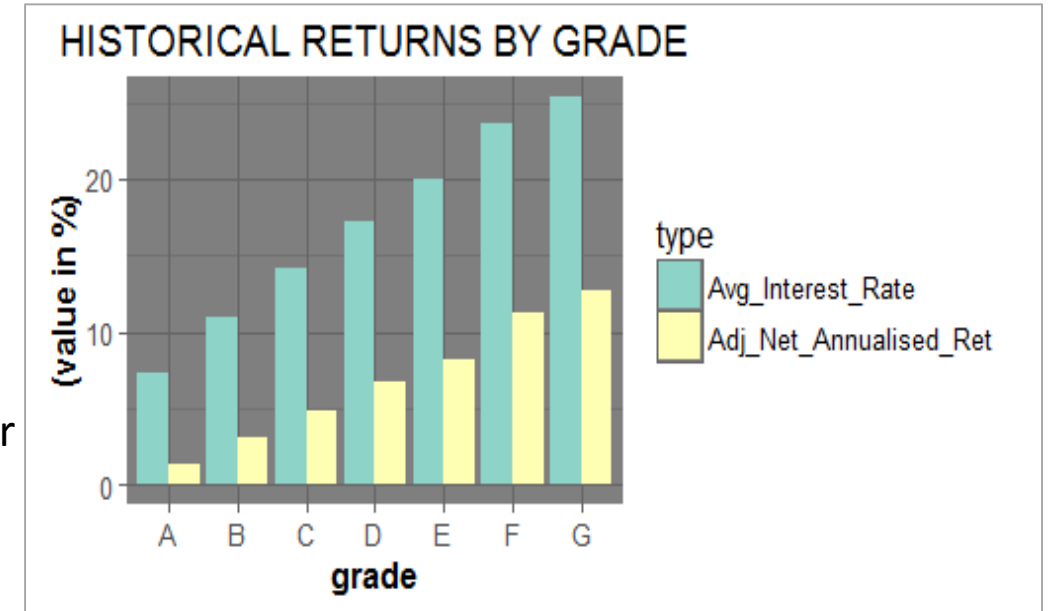
Net Annualized Return (NAR or "unadjusted NAR") is an annualized measure of the rate of return on the principal invested over the life of an investment.

LC introduced this new feature for its customers recently in the year 2013. Due to this, investors now have a more accurate return number that should provide more realistic expectations for investors.

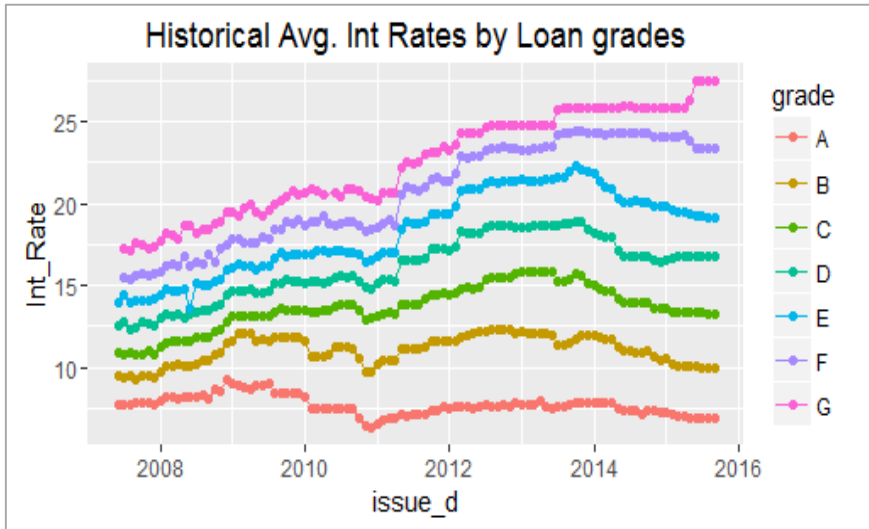
The average interest rate goes on increasing as we progress from grade A to G. Same trend can be observed for Adjusted NAR. Moreover, loans under grade A have significantly less interest rates and adjusted NAR too.

## ❑ Find the historical average interest rates by loan terms and loan grades

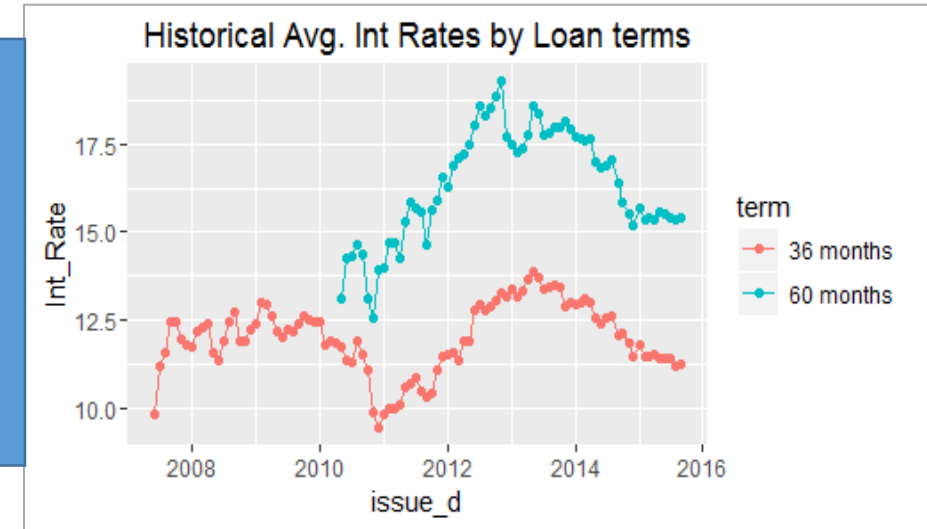
- The interest rate fluctuates a lot between 10-15% over the span of 10years.
- Mostly it was seen between 11-13%, however, in the year 2015-16, the interest rates went up higher to touch around 15%.



# Bank Loan Analysis

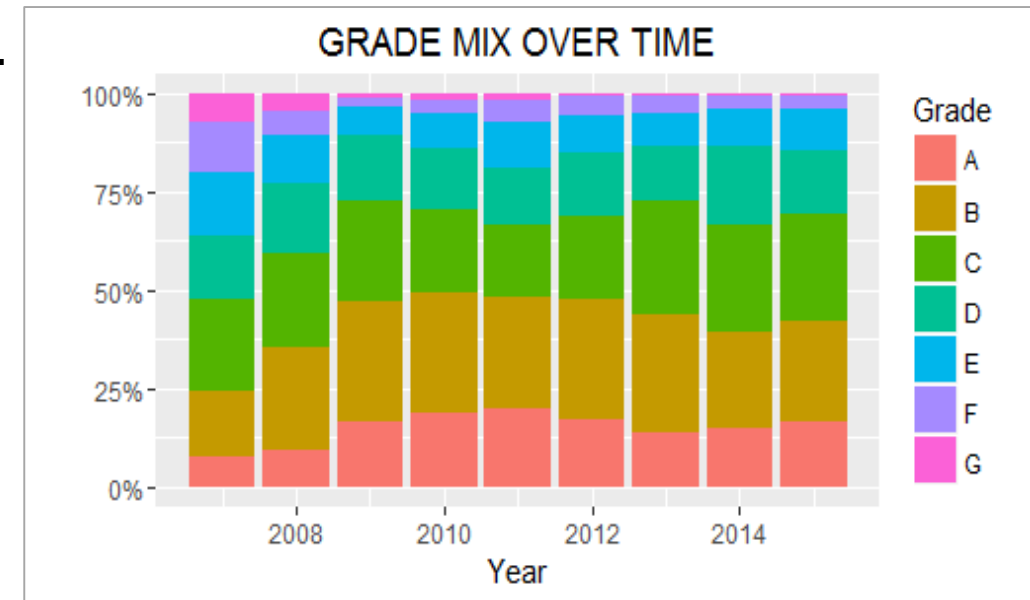


Moreover, the interest rates on loan grades increase as they move upward from grade A to G. Hence, the investments on grade A, B and C grades can prove to be much beneficial.



❑ What is percentage of loans by different loan grades by each year and loan term.

- In LC, based on each loan application and credit report, every loan is assigned a grade ranging from A1 to G5 with a corresponding interest rate.
- In our analysis, we observe that most applications of loan grades B and C are given by investors.
- Moreover, very less investors for loan grades F and G are seen(perhaps due to more interest rates).

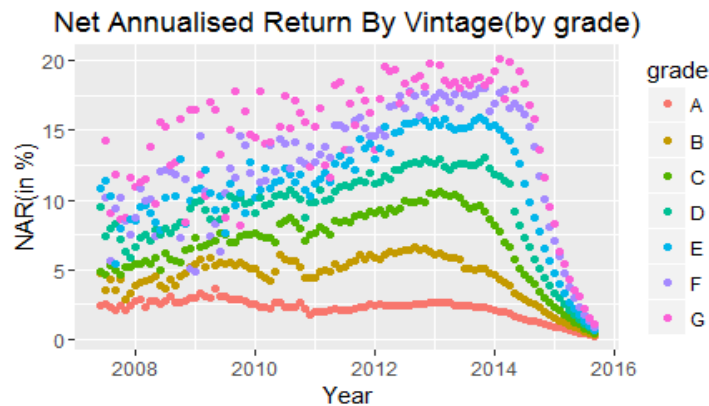


# Bank Loan Analysis

❑ What is the loan performance details by different loan grades and overall

	grade	Total_Issued	Fully Paid	Current	Late (16-30 days)	Late (31-120 days)	Charged Off	Principal_Payments_Recieved	Interest_Payments_Recieved	Avg_Interest_Rate	Adj_Net_Annualised_Ret
1	A	1742377875	463434500	1236776975	1097000	6575250	30203300	875038992	114677832	7.318398	1.380174
2	B	2924585400	785665050	1977346900	5288675	25078475	117206950	1443396060	310585441	10.990480	3.135029
3	C	2992855425	662456850	2084460975	8707900	45902425	166428700	1250073401	410272702	14.124416	4.779226
4	D	1869824425	404981350	1243768900	7733450	44568025	148811200	728962863	312202008	17.240532	6.784395
5	E	1097126050	217968275	716385225	6489325	32325525	108402375	373844170	211784854	20.014931	8.236211
6	F	390987500	86604475	224619225	2762300	13807600	56710925	138390008	92807826	23.602819	11.248195
7	G	102434000	24677800	52894825	746700	4868350	17174600	36786959	26194249	25.424212	12.684209

❑ Find Net Annualized returns by vintage by different loan grades and different loan terms (also for overall)



Moreover, the adjusted NAR on loan grades increase as they move upward from grade A to G. Hence, investors can get more returns by investing on grades A,B, and C loans and for 36 months terms.

