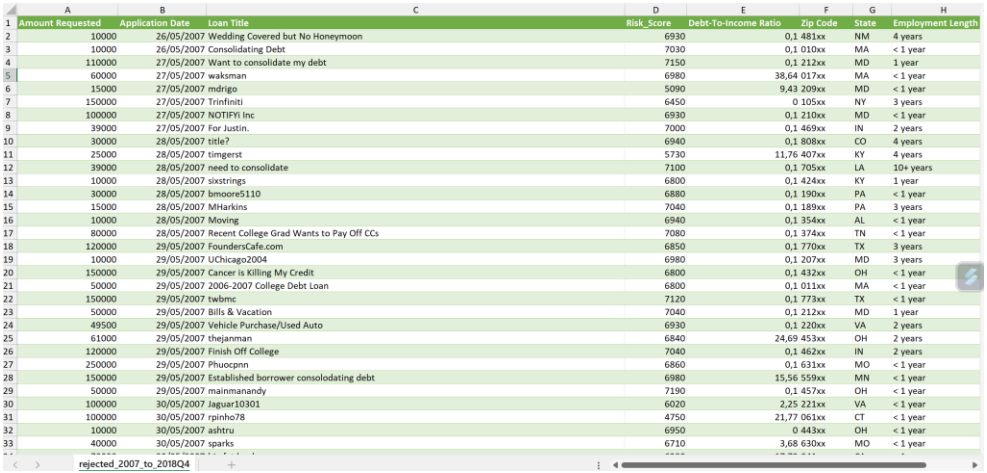
Name: Fathimah Az Zahra

Tasks: Meeting_2 (Case Study Of Demystifying the Workings of Lending Club)

Point of view: We aim to enhance credit risk management and provide insights into borrower behavior and loan performance.

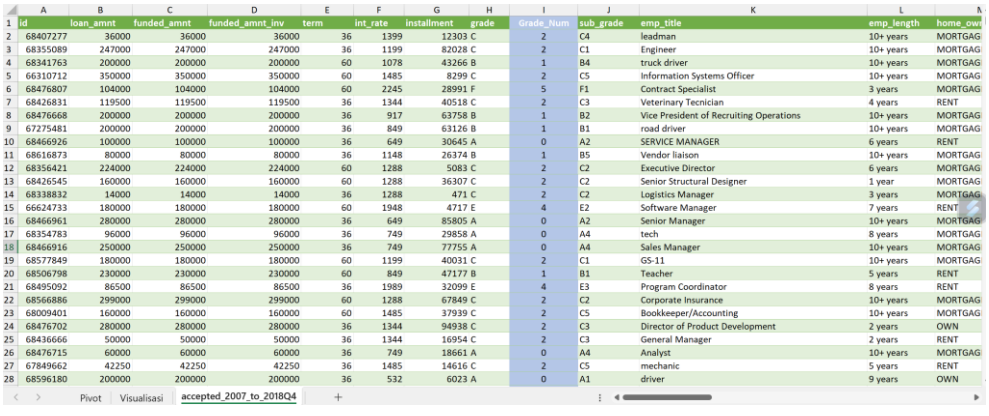
Processes carried out before creating a dashboard:

1. **Data Cleaning, Data Labeling, and Data Encoding (Using Excel)**



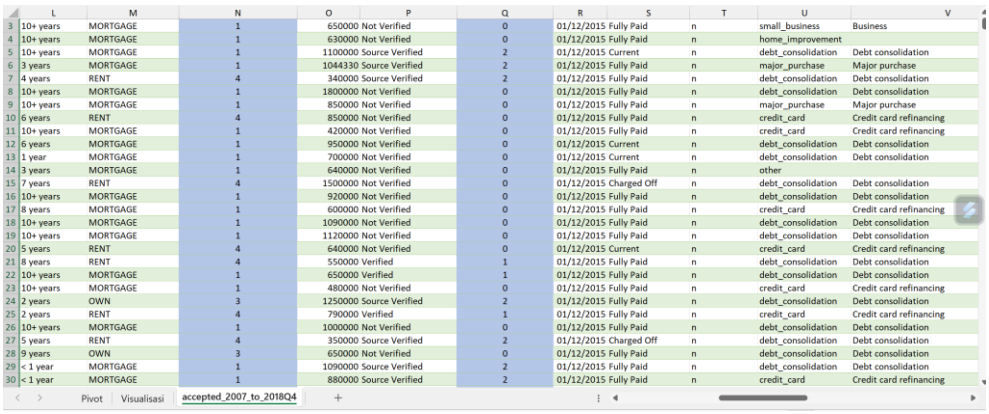
Amount Requested	Application Date	Loan Title	Risk_Score	Debt-To-Income Ratio	Zip Code	State	Employment Length
10000	26/05/2007	Wedding Covered but No Honeymoon	6930	0,1	481xx	NM	4 years
10000	26/05/2007	Consolidating Debt	7030	0,1	010xx	MA	< 1 year
110000	27/05/2007	Want to consolidate my debt	7150	0,1	212xx	MD	1 year
60000	27/05/2007	waksman	6980	38,64	017xx	MA	< 1 year
15000	27/05/2007	mdrigo	5090	9,43	209xx	MD	< 1 year
150000	27/05/2007	Trinfiniti	6450	0	105xx	NY	3 years
100000	27/05/2007	NOTIFYI Inc	6930	0,1	210xx	MD	< 1 year
39000	27/05/2007	For Justin.	7000	0,1	469xx	IN	2 years
30000	28/05/2007	title?	6940	0,1	808xx	CO	4 years
25000	28/05/2007	timgerst	5730	11,76	407xx	KY	4 years
39000	28/05/2007	need to consolidate	7100	0,1	705xx	LA	10+ years
10000	28/05/2007	sixstrings	6800	0,1	424xx	KY	1 year
30000	28/05/2007	bmoore5110	6880	0,1	190xx	PA	< 1 year
15000	28/05/2007	MHarkins	7040	0,1	189xx	PA	3 years
10000	28/05/2007	Moving	6940	0,1	354xx	AL	< 1 year
80000	28/05/2007	Recent College Grad Wants to Pay Off CCs	7080	0,1	374xx	TN	< 1 year
120000	29/05/2007	FoundersCafe.com	6850	0,1	770xx	TX	3 years
10000	29/05/2007	UChicago2004	6980	0,1	207xx	MD	3 years
150000	29/05/2007	Cancer is Killing My Credit	6800	0,1	432xx	OH	< 1 year
50000	29/05/2007	2006-2007 College Debt Loan	6800	0,1	011xx	MA	< 1 year
150000	29/05/2007	twbmc	7120	0,1	773xx	TX	< 1 year
50000	29/05/2007	Bills & Vacation	7040	0,1	212xx	MD	1 year
49500	29/05/2007	Vehicle Purchase/Used Auto	6930	0,1	220xx	VA	2 years
61000	29/05/2007	thejanman	6840	24,69	453xx	OH	2 years
120000	29/05/2007	Finish Off College	7040	0,1	462xx	IN	2 years
250000	29/05/2007	Phuocpnn	6860	0,1	631xx	MO	< 1 year
150000	29/05/2007	Established borrower consolodating debt	6980	15,56	559xx	MN	< 1 year
50000	29/05/2007	mainmanandy	7190	0,1	457xx	OH	< 1 year
100000	30/05/2007	Jaguar10301	6020	2,25	221xx	VA	< 1 year
100000	30/05/2007	rpinho78	4750	21,77	061xx	CT	< 1 year
10000	30/05/2007	ashtru	6950	0	443xx	OH	< 1 year
40000	30/05/2007	sparks	6710	3,68	630xx	MO	< 1 year

rejected_2007_to_2018Q4



id	loan_amnt	funded_amnt	funded_amnt_inv	term	int_rate	installment	grade	Grade_Num	sub_grade	emp_title	emp_length	home_ow
68407277	36000	36000	36000	36	1399	12303	C	2	C4	leadman	10+ years	MORTGAG
68355089	247000	247000	247000	36	1199	82028	C	2	C1	Engineer	10+ years	MORTGAG
68341763	200000	200000	200000	60	1078	43266	B	1	B4	truck driver	10+ years	MORTGAG
66310712	350000	350000	350000	60	1485	8299	C	2	C5	Information Systems Officer	10+ years	MORTGAG
68476807	104000	104000	104000	60	2245	28991	F	5	F1	Contract Specialist	3 years	MORTGAG
68426831	119500	119500	119500	36	1344	40518	C	2	C3	Veterinary Tecnician	4 years	RENT
68476668	200000	200000	200000	36	917	63758	B	1	B2	Vice President of Recruiting Operations	10+ years	MORTGAG
67275481	200000	200000	200000	36	849	63126	B	1	B1	road driver	10+ years	MORTGAG
68466926	100000	100000	100000	36	649	30645	A	0	A2	SERVICE MANAGER	6 years	RENT
68616873	80000	80000	80000	36	1148	26374	B	1	B5	Vendor liaison	10+ years	MORTGAG
68356421	224000	224000	224000	60	1288	5083	C	2	C2	Executive Director	6 years	MORTGAG
68426545	160000	160000	160000	60	1288	36307	C	2	C2	Senior Structural Designer	1 year	MORTGAG
68338832	14000	14000	14000	36	1288	471	C	2	C2	Logistics Manager	3 years	MORTGAG
66624733	180000	180000	180000	60	1948	4717	E	4	E2	Software Manager	7 years	RENT
68466961	280000	280000	280000	36	649	85805	A	0	A2	Senior Manager	10+ years	MORTGAG
68354783	96000	96000	96000	36	749	29858	A	0	A4	tech	8 years	MORTGAG
68466916	250000	250000	250000	36	749	77755	A	0	A4	Sales Manager	10+ years	MORTGAG
68577849	180000	180000	180000	60	1199	40031	C	2	C1	GS-11	10+ years	MORTGAG
68506798	230000	230000	230000	60	849	47177	B	1	B1	Teacher	5 years	RENT
68495092	86500	86500	86500	36	1989	32099	E	4	E3	Program Coordinator	8 years	RENT
68566886	299000	299000	299000	60	1288	67849	C	2	C2	Corporate Insurance	10+ years	MORTGAG
68009401	160000	160000	160000	60	1485	37939	C	2	C5	Bookkeeper/Accounting	10+ years	MORTGAG
68476702	280000	280000	280000	36	1344	94938	C	2	C3	Director of Product Development	2 years	OWN
68436666	50000	50000	50000	36	1344	16954	C	2	C3	General Manager	2 years	RENT
68476715	60000	60000	60000	36	749	18661	A	0	A4	Analyst	10+ years	MORTGAG
67849662	42250	42250	42250	36	1485	14616	C	2	C5	mechanic	5 years	RENT
68596180	200000	200000	200000	36	532	6023	A	0	A1	driver	9 years	OWN

Pivot | Visualisasi | accepted_2007_to_2018Q4

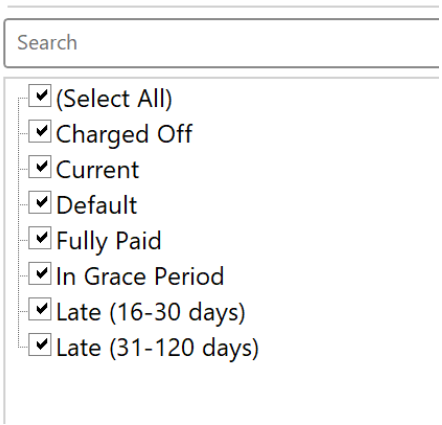


10+ years	MORTGAGE	1	650000	Not Verified	0	01/12/2015	Fully Paid	n	small_business	Business	
10+ years	MORTGAGE	1	630000	Not Verified	0	01/12/2015	Fully Paid	n	home_improvement		
10+ years	MORTGAGE	1	1100000	Source Verified	2	01/12/2015	Current	n	debt_consolidation	Debt consolidation	
3 years	MORTGAGE	1	1044330	Source Verified	2	01/12/2015	Fully Paid	n	major_purchase	Major purchase	
4 years	RENT	4	340000	Source Verified	2	01/12/2015	Fully Paid	n	debt_consolidation	Debt consolidation	
10+ years	MORTGAGE	1	1800000	Not Verified	0	01/12/2015	Fully Paid	n	debt_consolidation	Debt consolidation	
10+ years	MORTGAGE	1	850000	Not Verified	0	01/12/2015	Fully Paid	n	major_purchase	Major purchase	
6 years	RENT	4	850000	Not Verified	0	01/12/2015	Fully Paid	n	credit_card	Credit card refinancing	
10+ years	MORTGAGE	1	420000	Not Verified	0	01/12/2015	Fully Paid	n	credit_card	Credit card refinancing	
6 years	MORTGAGE	1	950000	Not Verified	0	01/12/2015	Current	n	debt_consolidation	Debt consolidation	
1 year	MORTGAGE	1	700000	Not Verified	0	01/12/2015	Current	n	debt_consolidation	Debt consolidation	
3 years	MORTGAGE	1	640000	Not Verified	0	01/12/2015	Fully Paid	n	other		
7 years	RENT	4	1500000	Not Verified	0	01/12/2015	Charged Off	n	debt_consolidation	Debt consolidation	
10+ years	MORTGAGE	1	920000	Not Verified	0	01/12/2015	Fully Paid	n	debt_consolidation	Debt consolidation	
8 years	MORTGAGE	1	600000	Not Verified	0	01/12/2015	Fully Paid	n	credit_card	Credit card refinancing	
10+ years	MORTGAGE	1	1090000	Not Verified	0	01/12/2015	Fully Paid	n	debt_consolidation	Debt consolidation	
10+ years	MORTGAGE	1	1120000	Not Verified	0	01/12/2015	Fully Paid	n	debt_consolidation	Debt consolidation	
5 years	RENT	4	640000	Not Verified	0	01/12/2015	Current	n	credit_card	Credit card refinancing	
8 years	RENT	4	550000	Verified	1	01/12/2015	Fully Paid	n	debt_consolidation	Debt consolidation	
10+ years	MORTGAGE	1	650000	Verified	1	01/12/2015	Fully Paid	n	debt_consolidation	Debt consolidation	
10+ years	MORTGAGE	1	480000	Not Verified	0	01/12/2015	Fully Paid	n	credit_card	Credit card refinancing	
2 years	OWN	3	1250000	Source Verified	2	01/12/2015	Fully Paid	n	debt_consolidation	Debt consolidation	
2 years	RENT	4	790000	Verified	1	01/12/2015	Fully Paid	n	credit_card	Credit card refinancing	
10+ years	MORTGAGE	1	1000000	Not Verified	0	01/12/2015	Fully Paid	n	debt_consolidation	Debt consolidation	
5 years	RENT	4	350000	Source Verified	2	01/12/2015	Charged Off	n	debt_consolidation	Debt consolidation	
9 years	OWN	3	650000	Not Verified	0	01/12/2015	Fully Paid	n	debt_consolidation	Debt consolidation	
< 1 year	MORTGAGE	1	1090000	Source Verified	2	01/12/2015	Fully Paid	n	debt_consolidation	Debt consolidation	
< 1 year	MORTGAGE	1	880000	Source Verified	2	01/12/2015	Fully Paid	n	credit_card	Credit card refinancing	

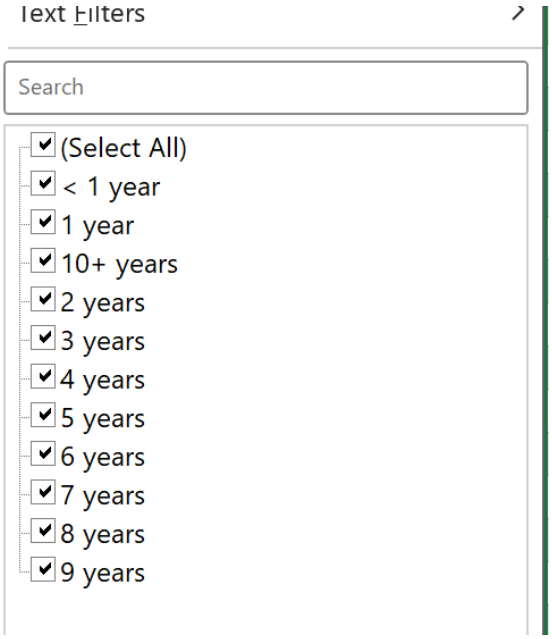
Pivot | Visualisasi | accepted_2007_to_2018Q4

Activities I do using Excel:

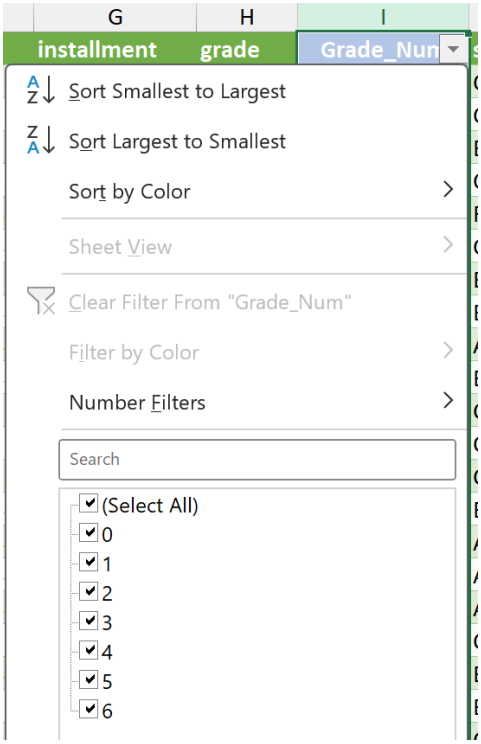
1. Missing Values:
   - For some data that contains missing values, by conducting previous analysis to find out what kind of data should be used and increased. I use AVG and MEAN based on the suitability of the values in the column. While for dropping values that are not needed for some columns, there are only a few and almost none, most of them are normalized on the data.
2. Duplicate Records
   - For duplicate data that is useful and useless to use, I prefer to find another way so that the data can be aligned with other values in the same column.
3. Outliers:
   - Removing Outliers on data that is unlikely to have similarities with other values, I decided to align it with the most data in the same column.
4. Data labelling: Saya hanya melakukan beberapa data labeling yang dituliskan pada assesment yang dikirimkan. Berikut yang saya lakukan:
   - Convert into categories in the loan_status table as follows:



   - Standardize the employee_length table, but I will do a separate formula in Power BI to do further calculations to get the results of 10+ years vs. 10 years.



5. Data Encoding
   - Create categorical columns on some columns especially on accepted files which are at least useful to use. Using label encoding I start the numbers from 0 – 6, such as A = 0 to G = 6.

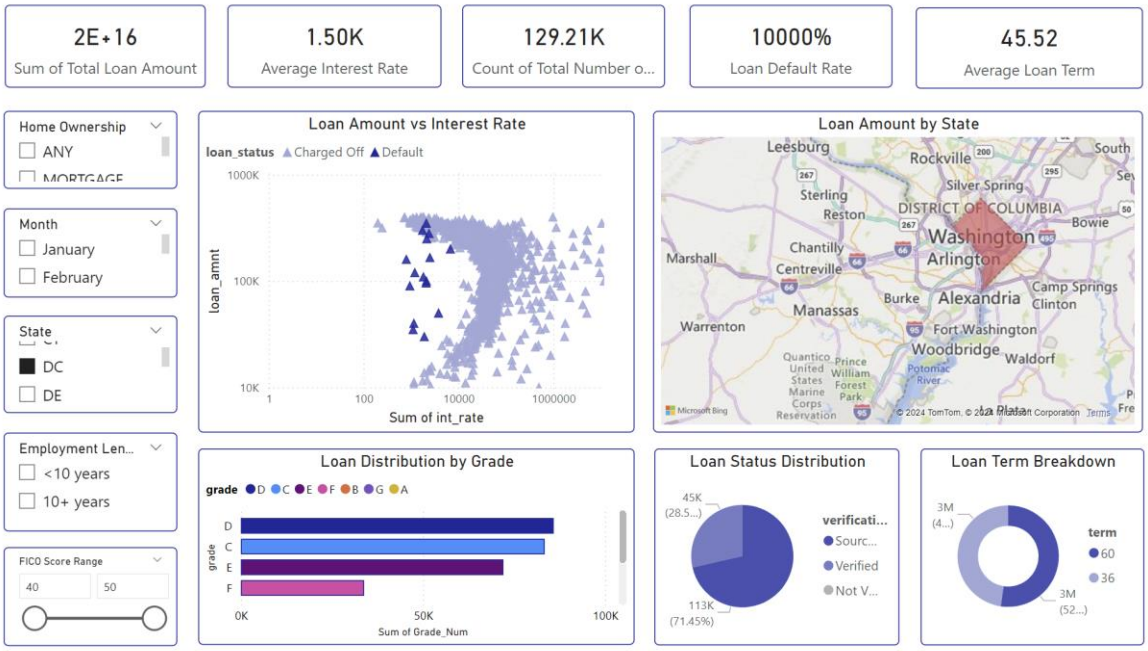


Dashboard creation process:

1. KPI (Calculating in Power BI)
2. Filters
3. Slincers
4. Visualization

Description about the tasks more detail:

The following are the results of my first dashboard, the dashboard can change according to revisions or data selection that is decided to be placed on the Loan Portfolio Overview dashboard.



Description:

1. The top section of your dashboard should be reserved for high-level, summary information presented in a clear, concise manner. you ensure that your dashboard is both effective and user-friendly, delivering the most important insights at a glance.
2. The central section of a dashboard should focus on displaying trend-related data, incorporating metrics that track activity, and using visuals that illustrate changes or patterns in the data over time.
3. The placement of some graphs and explanations also depends on how important the diagram is made. While the use of Filters is usually placed on the top of the

dashboard and the left side of the dashboard so that it is easy to see by dashboard readers or non-technical people.

Description of the diagram I worked on (based on my understanding)

KPI's:

1. **Loan Status: filter by loans status (loan_status)**

```
1  Total Loan Amount = SUM('accepted_2007_to_2018Q4'[loan_amnt])
2
```

2. **Average Interest Rate:**

```
1  Average Interest Rate = AVERAGE('accepted_2007_to_2018Q4'[int_rate])
2
```

3. **Total Number of Loans:**

```
1  Total Number of Loans = SUM('accepted_2007_to_2018Q4'[id])
```

4. **Loans Default Rate:**

```
1  Loan Default Rate =
2  VAR TotalLoans = COUNTROWS(accepted_2007_to_2018Q4)
3  VAR DefaultLoans = CALCULATE(COUNTROWS(accepted_2007_to_2018Q4),
4                               accepted_2007_to_2018Q4[loan_status] IN {"Charged Off", "Default"})
5  RETURN
6  (DefaultLoans / TotalLoans) * 100
```

5. **Average Loan Term:**

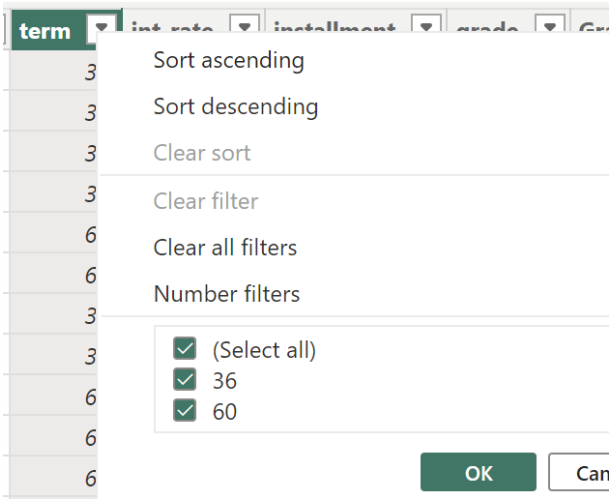
```
1  Average Loan Term = AVERAGE('accepted_2007_to_2018Q4'[term])
```

6. **Semua KIP's akan ditaruh paling atas pada dashboard:**

Filters:

1. Grade: filter by credit grade (grade / grade_num) : I created this filter based on data that has been converted into numerical data to make it easier to explain the data.
2. Home ownership: Filter loans by borrowers home ownership status (home_ownership)

3. Loan Team: Filter loans by term length (36 or 60 months) (Term): The column was normal from the beginning having two categories 36 and 60.



4. Employment Length: Filter loans by borrower employment length (Employment Length -> Rejected Excell): Based on the process that has been made, this column will only display two categories, namely, 10+ years and <10 years. This process is carried out to shorten the calculation process and grouping of analysis.

```
Employment Length Category =
IF(
    'rejected_2007_to_2018Q4'[Employment Length] = "10+ years",
    "10+ years",
    "<10 years"
)
```

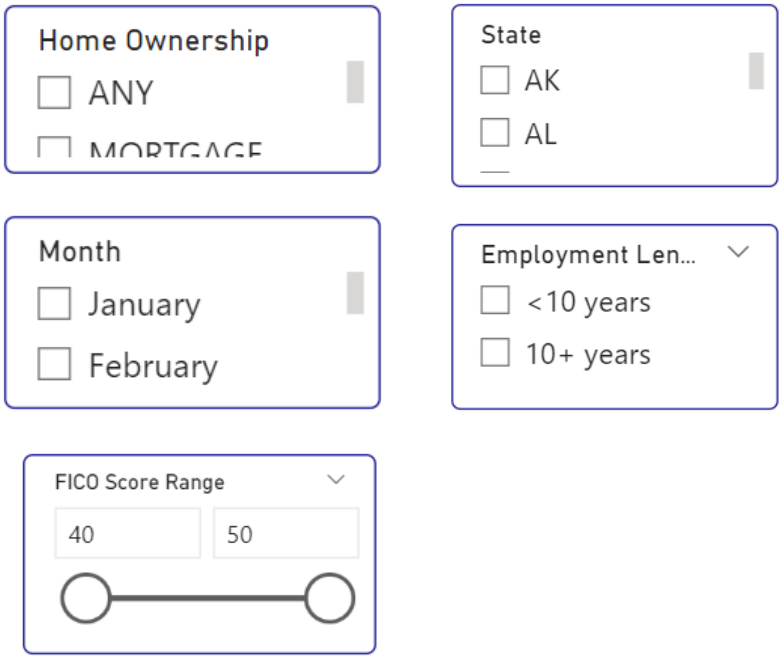
5. Loan Status: Filtering to group them into two, namely Charged off and Default. Because previously there were several categories that could at least be eliminated and chose to use both categories.

```
Loan Status Filtered =
IF(
    'accepted_2007_to_2018Q4'[loan_status] = "Charged Off" || 'accepted_2007_to_2018Q4'[loan_status] = "Default",
    'accepted_2007_to_2018Q4'[loan_status],
    BLANK()
)
```

Slincers:

1. Issues Date: Filter loans by their issues date (issues_d)
2. State: Filter loans by borrowers state (State -> Rejected Excell)

3. FICO Score Range: Filter loans by FICO score range.

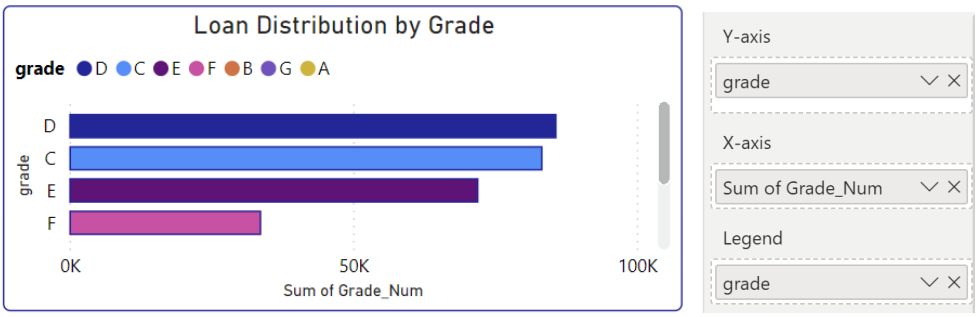


Slincers yang digunakan diatas dipilih untuk memudahkan melihat grafik-grafik, seperti Slincers Issue Date, State, FICO yang dibuat pada kalkulasi pada Power BI.

Visualizations:

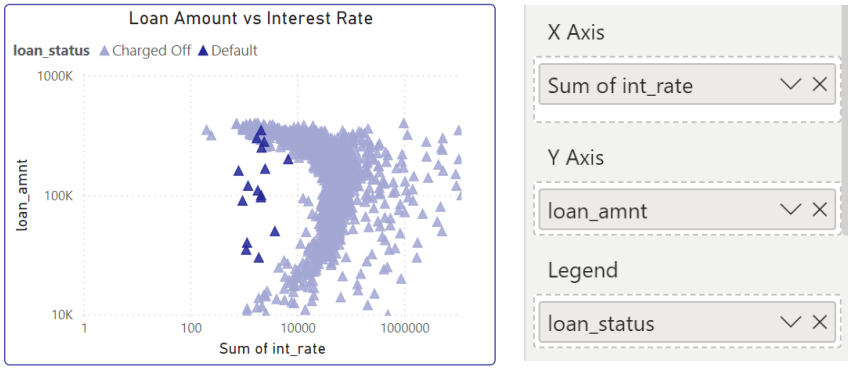
1. Loan Distribution by Grade: Bar Chart -> show distribution of loans across different grades (Grade)

   Dengan memilih kolumn Grade yang normal dan kolumn Grade yang sebelumnya sudah dilakukan labeling encoding untuk merubahnya menjadi numerical dapat membantu proses perhitungan distribusi loan by Grade. Dengan memakai legend by kolumn Grade dapat dilihat bahwa kebanyakan distribusi tersebut berada diangka 70 - 80K.



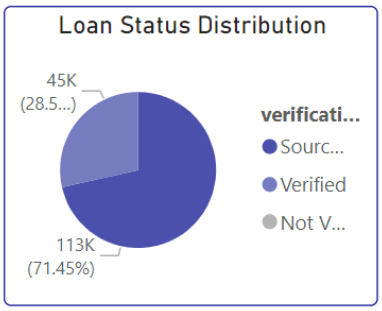
2. Loan Amount vs Interest Rate: Scatter Plot -> show the relationship between loan amount and interest rate (loan_amnt , int_rate)

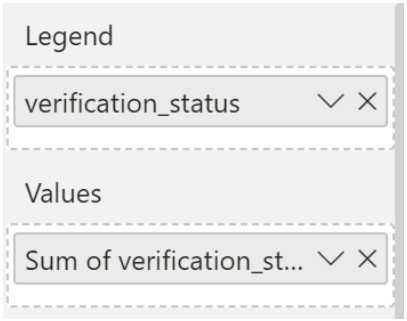
   The plot highlights the diversity and complexity of the loan data by giving a clear visual breakdown of how loan amounts and interest rates are allocated among loans with various statuses.



3. Loan Status Distribution: Pie Chart -> show distribution with loans by status (verification_status)

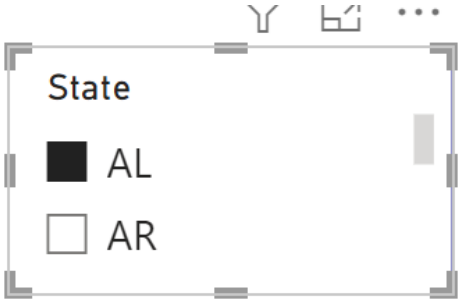
   When it comes to determining risk and loan quality, this pie chart can be used to evaluate the diligence with which the loan issuer verifies the income of the borrower.





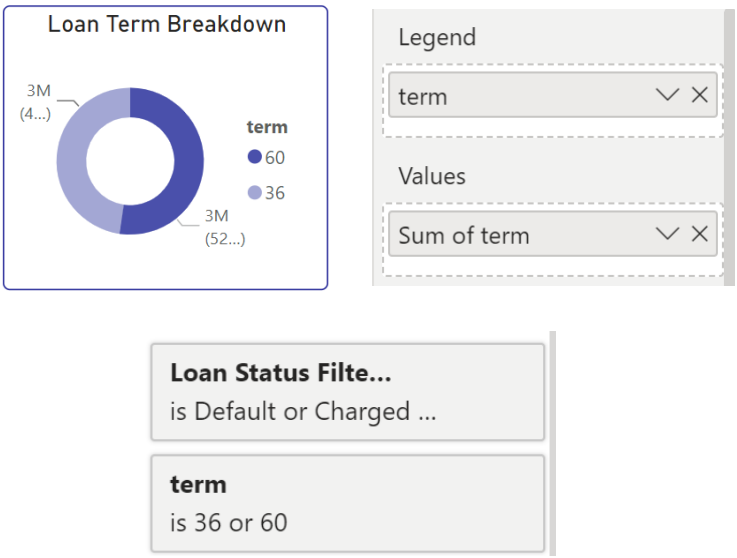
4. Loan Amount by State: Map -> display total loan amount by state (loan_amnt , State)

   Shows the total amount of loans (Loan_amnt) requested in each state, making it possible to quickly and interactively analyze how loans are distributed geographically.



5. Loan Term Breakdown: Donut Chart -> show propositions of loans with different terms (Term)

   Use "Count of Term" instead of "Sum of Term" in the Values field of your Power BI donut chart to more accurately depict the distribution of loans according to their term lengths (36 or 60 months). Instead of adding up the term values, this modification will count the number of loans for each term, giving a clearer view of how many loans are set for 36 months vs 60 months.



Note: The dashboard above may change again if there are revisions and additional data on the project. I would like to say Thank You for wanting to give me this project to do and study further.