

Bank Loan Report Analysis

- Presented by **Soumya Das**

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Links:

- [Dataset](#)
- [Excel File](#)
- [Tableau Dashboard](#)

Introduction

Project Overview:

This project analyzes one year of bank loan data gives a comprehensive view of the loans in 50 US states using **Excel and Tableau**.

Objectives:

- **Explore Loan Details:** Understand where loans are distributed by state, employment length, and loan grade.
- **Financial Analysis:** Look at borrower income and debt ratios affecting loan terms.
- **Track Loan Status:** See how loans are being paid back or if they're in default, by loan purpose and verification status.
- **Visualize Trends:** Use Tableau to show how loan amounts and interest rates change over time.
- **Predictive Insights:** Forecast future loan needs and find out what factors might lead to more loans not being paid back.

Outcomes:

This project helps stakeholders:

- Understand where loans are most popular and who's taking them.
- Make better decisions about loan approvals and financial planning.
- Manage risks and improve loan policies based on data insights.

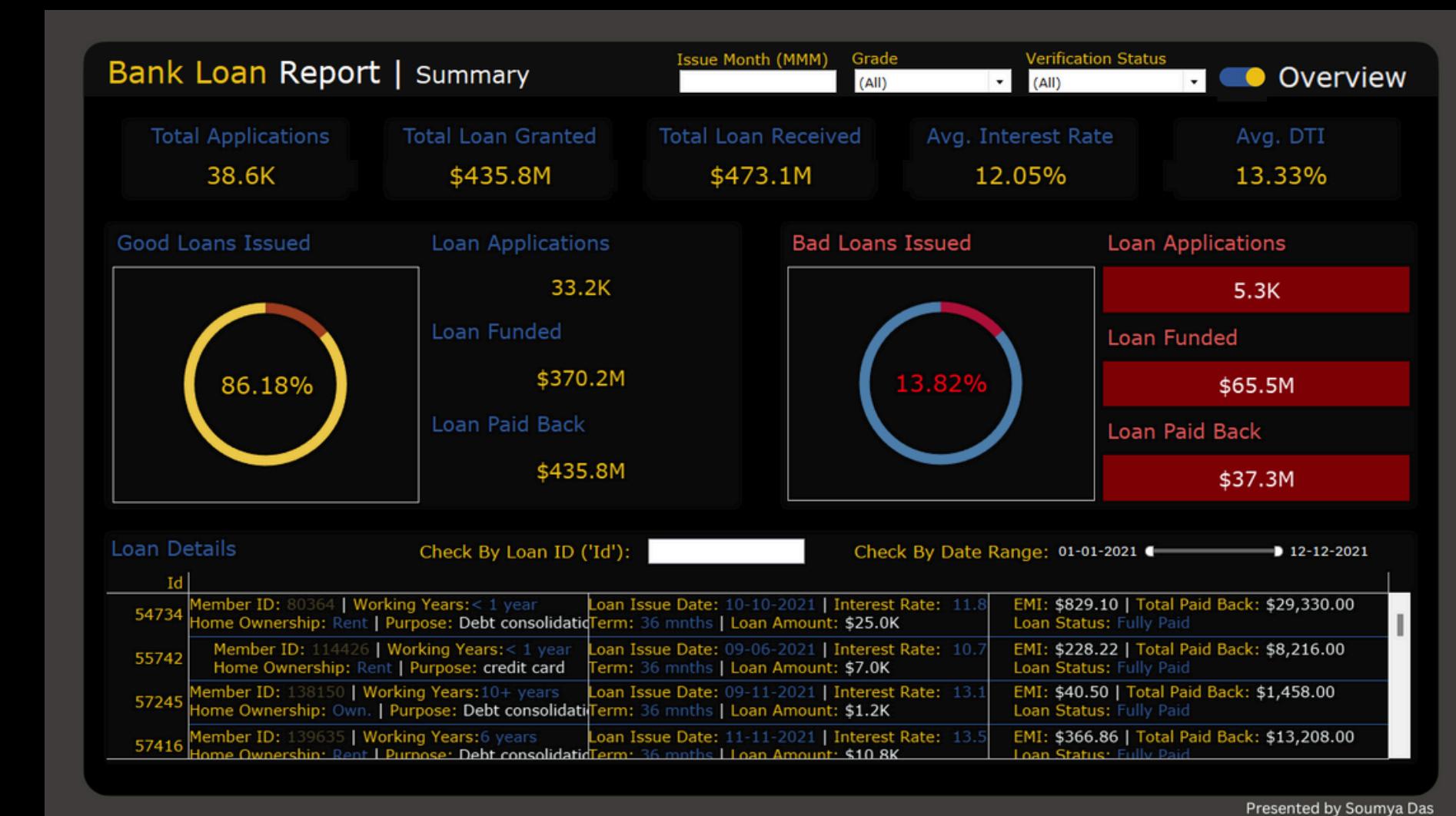
About the data

The dataset includes loan records from banks across **50 states in the USA**, issue between **January 2021** and **December 2021**. It comprises detailed information such as **loan ID, state, employment details, loan grade, home ownership status, issue dates, loan status, types, payment schedules, and financial metrics like annual income and debt-to-income ratios.**

The data was initially provided in **MS-Excel (.xlsx)** format and subsequently converted to **CSV** after cleaning and charting. Visualizations were created using **Tableau** to illustrate insights and support decision-making processes.

Excel Charts: [GitHub Link](#)

Tableau Chart: [Tableau Public](#)



Data Cleaning and Preparation (MS Excel)

Changing data type from general to date format

issue_date	last_credit_pull_date	last_payment_date	next_payment_date
02-11-2021	13-09-2021	13-04-2021	13-05-2021
01-01-2021	14-12-2021	15-01-2021	15-02-2021
01-05-2021	12-12-2021	01-09-2021	02-09-2021
25-02-2021	12-12-2021	03-12-2021	04-12-2021
01-01-2021	14-12-2021	15-01-2021	15-02-2021
17-07-2021	16-03-2021	08-12-2021	09-12-2021
19-11-2021	14-06-2021	13-12-2021	13-01-2022
06-11-2021	14-07-2021	14-07-2021	14-08-2021
09-02-2021	15-06-2021	10-12-2021	11-12-2021
02-09-2021	16-03-2021	16-03-2021	16-04-2021
22-07-2021	13-09-2021	13-08-2021	13-09-2021
09-11-2021	13-03-2021	10-12-2021	11-12-2021
08-11-2021	13-10-2021	13-09-2021	13-10-2021
12-11-2021	14-12-2021	14-12-2021	14-01-2022
10-11-2021	14-12-2021	14-12-2021	14-01-2022
12-11-2021	14-02-2021	13-10-2021	13-11-2021
12-02-2021	16-04-2021	14-12-2021	14-01-2022
10-09-2021	15-09-2021	11-12-2021	12-12-2021
12-12-2021	14-12-2021	14-12-2021	14-01-2022

Standardizing state_names

```
=IFS($B2="GA","Georgia",$B2="CA","California",$B2="TX","TEXAS",$B2="AK","Alaska",$B2="AL","Alabama",$B2="AR","Arkansas",$B2="AZ","Arizona",$B2="CO","Colorado",$B2="CT","Connecticut",$B2="DC","Washington,DC",$B2="DE","Delaware",$B2="FL","Florida",$B2="HI","Hawaii",$B2="IA","Iowa",$B2="ID","Idaho",$B2="IL","Illinois",$B2="IN","Indiana",$B2="KS","Kansas",$B2="KY","Kentucky",$B2="LA","Louisiana",$B2="ME","Maine",$B2="MD","Maryland",$B2="MA","Massachusetts",$B2="MI","Michigan",$B2="MN","Minnesota",$B2="MO","Missouri",$B2="MS","Mississippi",$B2="MT","Montana",$B2="NC","North Carolina",$B2="NE","Nebraska",$B2="NH","New Hampshire",$B2="NJ","New Jersey",$B2="NV","Nevada",$B2="NY","New York",$B2="OH","Ohio",$B2="OK","Oklahoma",$B2="OR","Oregon",$B2="PA","Pennsylvania",$B2="RI","Rhode Island",$B2="SC","South Carolina",$B2="SD","South Dakota",$B2="TN","Tennessee",$B2="UT","Utah",$B2="VA","Virginia",$B2="VT","Vermont",$B2="WA","Washington",$B2="WI","Wisconsin",$B2="WV","West Virginia",$B2="WY","Wyoming",$B2="NM","New Mexico")
```

state_names
Georgia
California
California
TEXAS
Illinois

Changing data type from general to currency format

annual_income	installment	loan_amount	total_payment
30000	59.83	2500	1009
48000	109.43	3000	3939
50000	421.65	12000	3522
42000	97.06	4500	4911
83000	106.53	3500	3835
28000	275.96	8000	8637
94800	205.86	6000	7218
59000	172.1	5500	6172
116400	762.08	24000	8650
	93.21		5551

Removing application_type

application_type	Custom Sort
INDIVIDUAL	Sheet View
INDIVIDUAL	Clear Filter from 'application_type'
INDIVIDUAL	Filter By Color
INDIVIDUAL	Text Filters
INDIVIDUAL	Search
INDIVIDUAL	Select All
INDIVIDUAL	INDIVIDUAL

Data Preparation (Tableau)

Calculating Measure: Total Applications

```
Total Applications  
  
IF COUNT([Id]) >= 1000000 THEN  
    STR(ROUND(FLOAT(COUNT([Id])) / 1000000, 1)) + "M"  
ELSEIF COUNT([Id]) >= 1000 AND COUNT([Id]) < 1000000 THEN  
    STR(ROUND(FLOAT(COUNT([Id])) / 1000, 1)) + "K"  
ELSE  
    STR(COUNT([Id]))  
END  
  
The calculation is valid.  
9 Dependencies ▾  
```

Formatting Text

Member ID: <Member Id> | Working Years:<Emp Length>
Home Ownership: <Home Ownership> | Purpose: <Purpose>

Member ID: <Member Id> | Working Years:<Emp Length>
Home Ownership: <Home Ownership> | Purpose: <Purposes>

Calculating Measure: Total Loan Paid Back

```
Total Loan Received  
  
IF SUM([Amount Received (INTEGER)]) >= 1000000 THEN  
    "$" + STR(ROUND(FLOAT(SUM([Amount Received (INTEGER)])) / 1000000, 1)) + "M"  
ELSEIF SUM([Amount Received (INTEGER)]) >= 1000 AND SUM([Amount Received (INTEGER)]) < 1000000 THEN  
    "$" + STR(ROUND(FLOAT(SUM([Amount Received (INTEGER)])) / 1000, 1)) + "K"  
ELSE  
    "$" + STR(SUM([Amount Received (INTEGER)]))  
END
```

Calculating Measure: Total Loan Funded

```
Total Loan Granted  
  
IF SUM([Loan Granted (INTEGER)]) >= 1000000 THEN  
    "$" + STR(ROUND(FLOAT(SUM([Loan Granted (INTEGER)])) / 1000000, 1)) + "M"  
ELSEIF SUM([Loan Granted (INTEGER)]) >= 1000 AND SUM([Loan Granted (INTEGER)]) < 1000000 THEN  
    "$" + STR(ROUND(FLOAT(SUM([Loan Granted (INTEGER)])) / 1000, 1)) + "K"  
ELSE  
    "$" + STR(SUM([Loan Granted (INTEGER)]))  
END
```

Adding Filters & Marks

The screenshot shows the Tableau Data Prep interface with two columns of filters and marks. The left column includes filters for 'Id' (selected), 'Issue Month', 'Verification Status', 'Grade', 'Action (Purpos..)', 'Action (Issue ..)', and 'Action (Home ..)'. It also has sections for 'Marks' (All, AGG(AVG(-1.0))), 'Shape' (Color, Size, Label), and 'Detail' (Member Id, Emp Length, Home Ownersh., Purpose). The right column includes filters for 'Issue Date' (selected), 'Id', 'Action (Purpos..)', 'Action (Issue ..)', 'Action (Home ..)', 'Color', 'Size', 'Label', 'Detail' (State Names, AGG(Applicati..), AGG(Total App..)), and 'Tooltip'.

Key Performance Indicators

Total Applications

38.6K

Total Loan Granted

\$435.8M

Total Loan Received

\$473.1M

Avg. Interest Rate

12.05%

Avg. DTI

13.33%

TOTAL LOAN APPLICATIONS

38.6K

MTD

4.3K

MoM

48.1%

TOTAL FUNDED AMOUNT

\$435.8M

MTD

\$51.5M

MoM

58.3%

TOTAL AMOUNT RECEIVED

\$473.1M

MTD

\$55.7M

MoM

57.9%

AVERAGE INTEREST RATIO

12.05%

MTD

12.34%

MoM

1.2%

AVERAGE D-TI RATIO

13.33%

MTD

13.77%

MoM

4.6%

Good Loans | Bad Loans

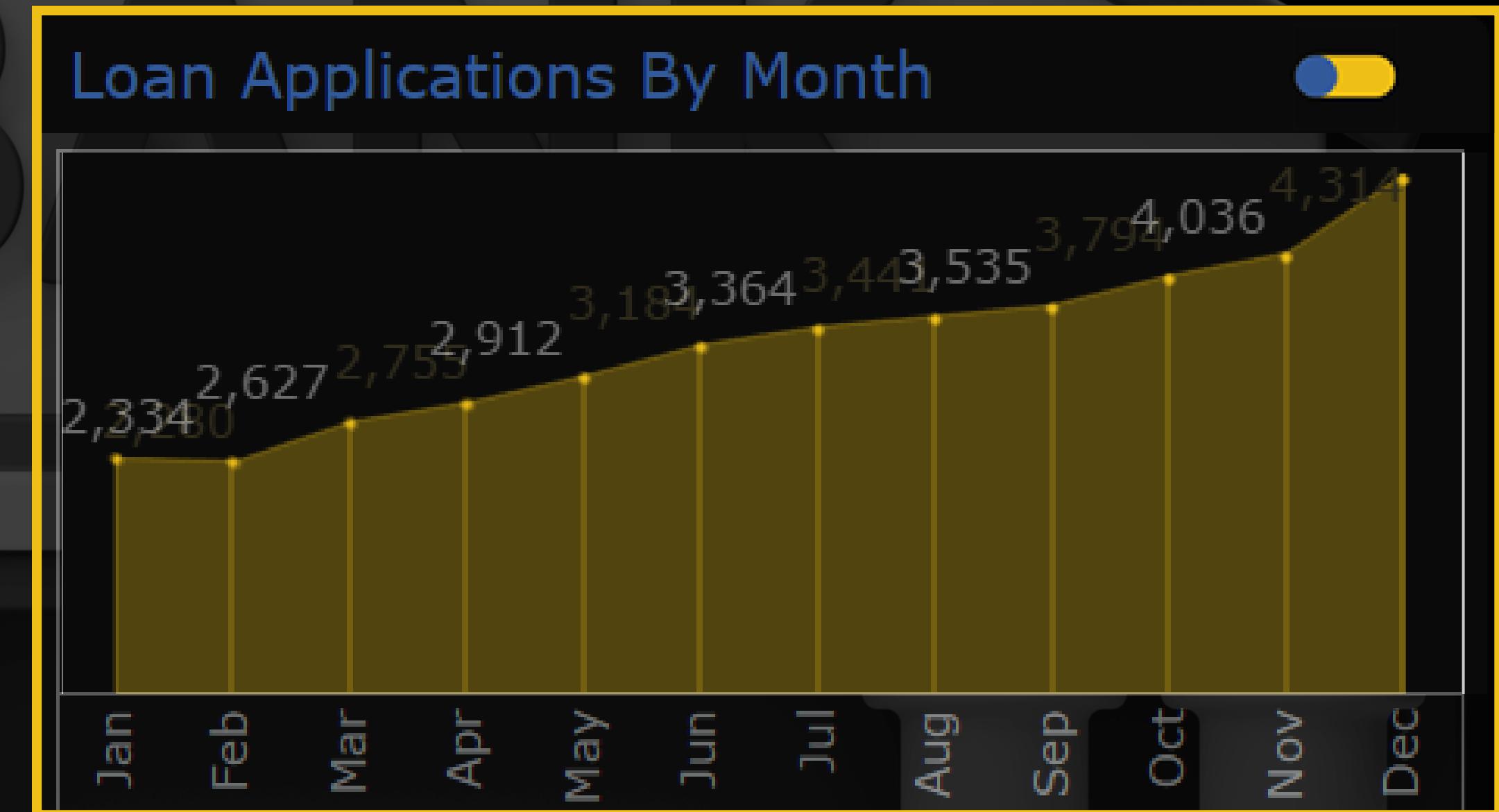


GOOD LOANS					
	Total Loan Applications	Total Loan Amount Funded	Total Amount Received	Avg. Interest Rates	Average Debt-to-Income Ratio
grade	Count of id	Sum of loan_amount	Sum of total_payment	Average of int_rate	Average of dti
A	27.49%	\$7,98,14,475	\$8,55,56,811	7.33%	11.96%
B	31.08%	\$11,58,07,225	\$13,25,43,443	11.01%	13.39%
C	19.97%	\$7,32,96,975	\$8,80,12,973	13.54%	13.80%
D	12.36%	\$5,06,99,250	\$6,32,95,065	15.68%	13.98%
E	6.30%	\$3,31,79,975	\$4,27,03,792	17.66%	14.08%
F	2.16%	\$1,29,08,100	\$1,73,91,194	19.63%	14.22%
G	0.65%	\$45,18,850	\$62,82,892	21.35%	14.11%
home_ownership	Count of id	Sum of loan_amount	Sum of total_payment	Average of int_rate	Average of dti
RENT	47.38%	\$15,67,77,775	\$18,52,61,281	12.03%	13.44%
MORTGAGE	45.02%	\$18,75,81,025	\$22,04,09,767	11.50%	13.01%
OWN	7.34%	\$2,50,51,725	\$2,92,09,159	11.56%	13.15%
OTHER	0.24%	\$7,97,525	\$8,86,910	11.78%	10.83%
NONE	0.01%	\$16,800	\$19,053	8.70%	11.75%
emp_length	Count of id	Sum of loan_amount	Sum of total_payment	Average of int_rate	Average of dti
< 1 year	11.86%	\$3,76,75,925	\$4,40,16,728	11.67%	12.47%
1 year	8.37%	\$2,80,83,450	\$3,28,56,221	11.80%	12.92%
10+ years	22.71%	\$9,68,00,625	\$11,45,48,806	11.74%	13.60%
2 years	11.49%	\$3,89,42,800	\$4,58,10,919	11.81%	13.03%
3 years	10.65%	\$3,76,43,200	\$4,40,49,350	11.72%	13.05%
4 years	8.95%	\$3,23,95,025	\$3,81,74,225	11.89%	13.15%
5 years	8.50%	\$3,15,27,700	\$3,71,69,275	11.74%	13.29%
6 years	5.78%	\$2,17,65,225	\$2,57,21,228	11.77%	13.75%
7 years	4.54%	\$1,74,22,750	\$2,06,73,179	11.84%	13.47%
8 years	3.84%	\$1,49,33,025	\$1,74,23,668	11.61%	13.61%
9 years	3.31%	\$1,30,35,125	\$1,53,42,571	11.64%	13.46%

BAD LOANS					
	Total Loan Applications	Total Loan Amount Funded	Total Amount Received	Avg. Interest Rates	Average Debt-to-Income Ratio
grade	Count of id	Sum of loan_amount	Sum of total_payment	Average of int_rate	Average of dti
A	10.35%	\$44,37,750	\$24,94,752	7.63%	13.26%
B	25.18%	\$1,48,96,750	\$82,31,572	11.14%	13.77%
C	23.74%	\$1,41,59,475	\$79,60,545	13.59%	14.50%
D	20.10%	\$1,32,21,550	\$75,28,826	15.83%	14.00%
E	12.96%	\$1,09,85,125	\$64,60,359	17.85%	14.15%
F	5.83%	\$60,02,350	\$36,25,544	20.01%	14.06%
G	1.84%	\$18,29,225	\$9,83,165	21.50%	13.95%
home_ownership	Count of id	Sum of loan_amount	Sum of total_payment	Average of int_rate	Average of dti
RENT	50.38%	\$2,89,90,700	16561775	13.90%	13.87%
MORTGAGE	41.83%	\$3,17,48,125	18064671	13.86%	14.22%
OWN	7.44%	\$45,45,950	2519970	13.87%	13.78%
OTHER	0.34%	\$2,47,450	138347	13.19%	13.13%
emp_length	Count of id	Sum of loan_amount	Sum of total_payment	Average of int_rate	Average of dti
< 1 year	11.83%	\$65,34,700	3528283	13.47%	13.10%
1 year	8.34%	\$47,99,675	2642127	13.62%	13.98%
10+ years	24.79%	\$1,93,15,325	11322810	14.08%	14.37%
2 years	10.52%	\$60,25,175	3396042	13.83%	13.61%
3 years	10.28%	\$62,94,650	3502482	13.95%	13.88%
4 years	8.51%	\$52,05,350	2790625	13.95%	13.52%
5 years	8.42%	\$54,45,925	3228296	13.83%	14.31%
6 years	5.74%	\$38,47,425	2187430	14.00%	14.28%
7 years	4.91%	\$33,88,975	1910957	14.12%	14.86%
8 years	3.75%	\$26,25,925	1602109	13.78%	14.76%
9 years	2.91%	\$20,49,100	1173602	13.84%	14.10%

Loan Applications by Months

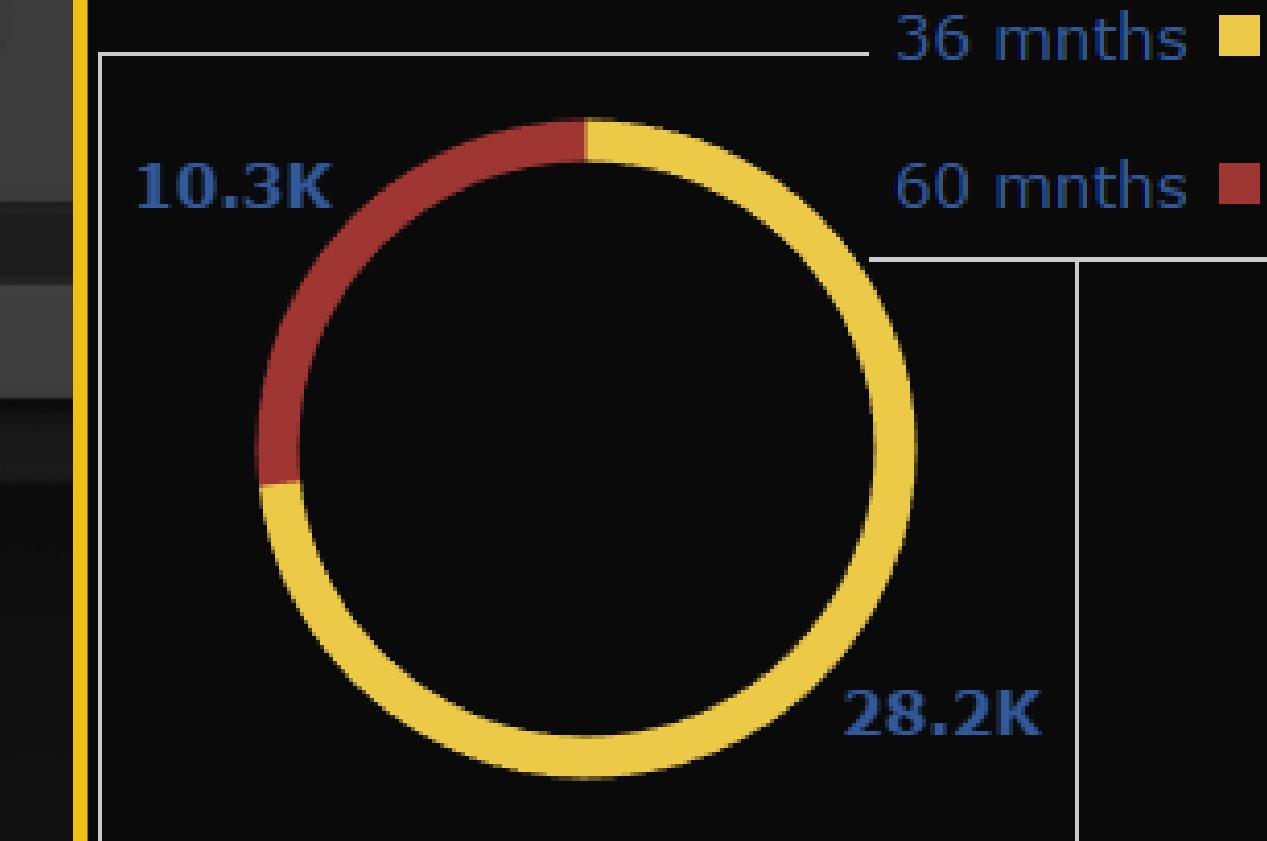
issue_month	Count of id
Jan	2,334
Feb	2,280
Mar	2,627
Apr	2,755
May	2,912
Jun	3,184
Jul	3,364
Aug	3,441
Sep	3,535
Oct	3,794
Nov	4,036
Dec	4,314



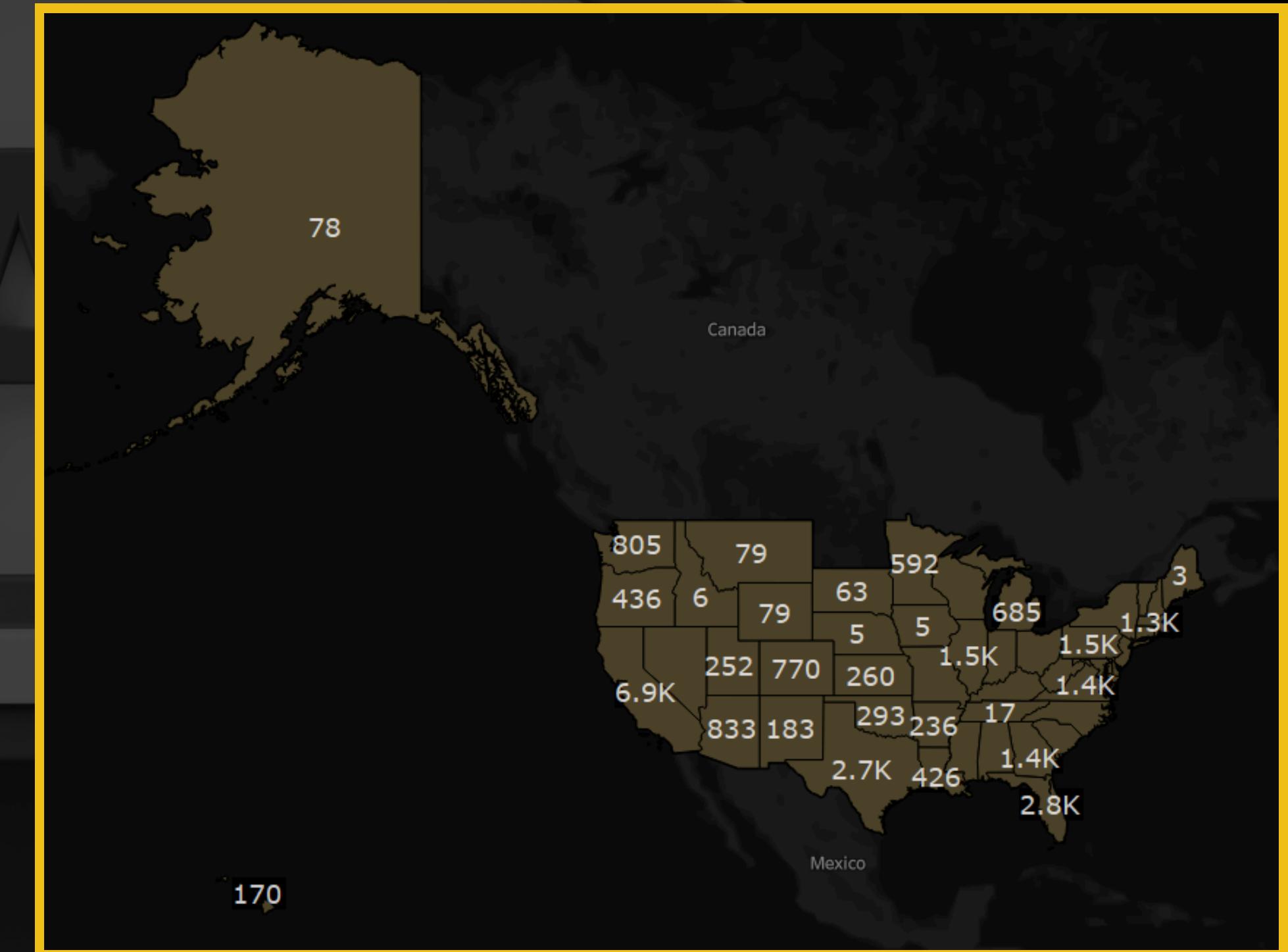
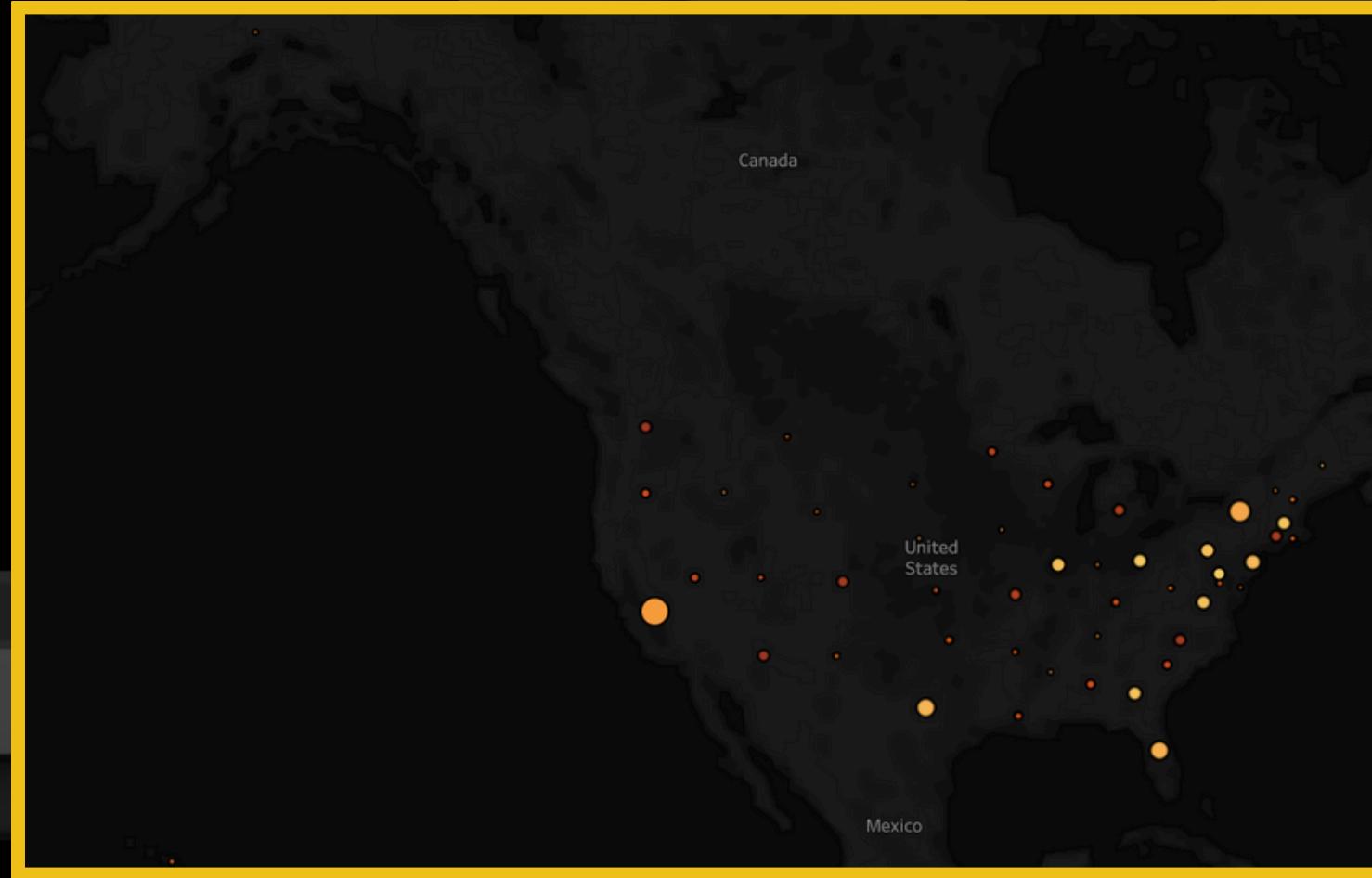
Loan Applications by Term-Period

term	Count of id
36 months	28,237
60 months	10,339

Loan Applications By Term



Loan Applications by State

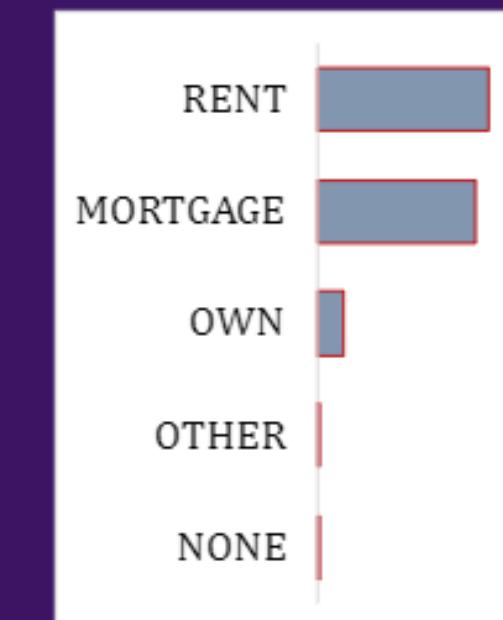
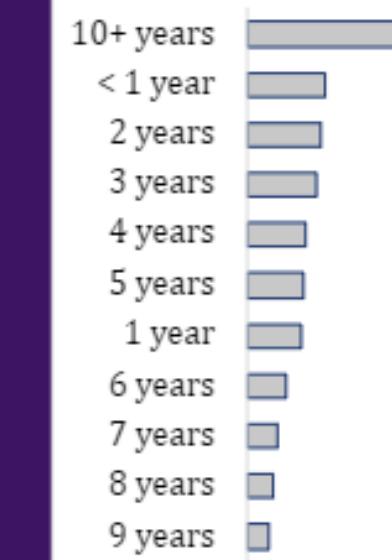
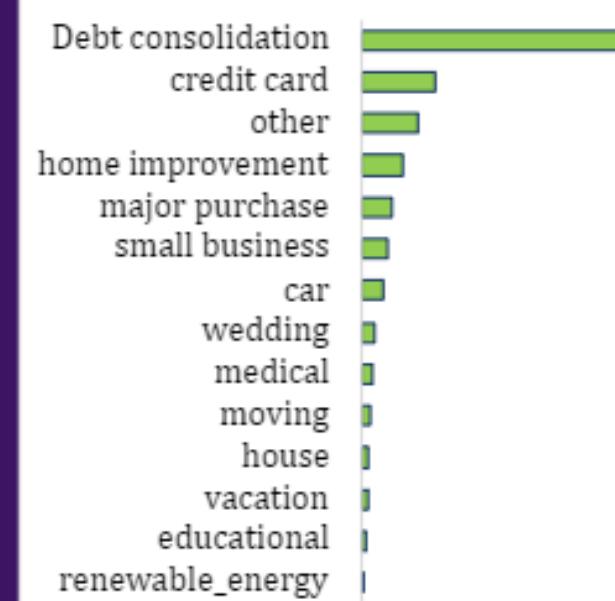


Secondary KPIs

purpose	Count of id
renewable_energy	94
educational	315
vacation	352
house	366
moving	559
medical	667
wedding	928
car	1,497
small business	1,776
major purchase	2,110
home improvement	2,876
other	3,824
credit card	4,998
Debt consolidation	18,214

emp_length	Count of id
9 years	1,255
8 years	1,476
7 years	1,772
6 years	2,228
1 year	3,229
5 years	3,273
4 years	3,428
3 years	4,088
2 years	4,382
< 1 year	4,575
10+ years	8,870

home_ownership	Count of id
NONE	3
OTHER	98
OWN	2,838
MORTGAGE	17,198
RENT	18,439



Conclusion

Summary of Findings:

- **Loan Distribution:** Looked at how loans are spread across 50 US states, job lengths, and loan grades.
- **Financial Profiles:** Checked borrower incomes and debt levels.
- **Loan Status:** Tracked how loans are being paid back or if they are in default.
- **Trends:** Showed changes in loan amounts and interest rates over the year.
- **Predictions:** Estimated future loan needs and identified risk factors.

Key Takeaways:

- Better understanding of where and to whom loans are given.
- Improved decision-making for loan approvals and financial planning.
- Enhanced risk management and loan policies based on data insights.

Next Steps:

- Use insights for planning and growth.
- Make data-driven decisions to boost profitability.
- Keep tracking trends and improving predictions.

Visit my website at:

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Thank you