

BANK LOAN – FULL REPORT

Key Performance Indicators (KPIs) Requirements

1. Total Loan Applications:

We need to calculate the total number of loan applications received during a specified period. Additionally, it is essential to monitor the Month-to-Date Loan Applications and track changes Month-over-Month

2. Total Funded Amount:

Understanding the total amount of funds disbursed as loans is crucial. We also want to keep an eye on the MTD Total Funded Amount and analyze the Month-over-Month changes in this metric.

3. Total Amount Received:

Tracking the total amount received from borrowers is essential for accessing the bank's cash flow and loan repayment. We should analyze the Month-to-Date Total Amount Received and observe the Month-over-Month changes.

4. Average Interest Rate:

Calculating the average interest rate across all loans, MTD, and monitoring the Month-over-Month variances in interest rates will provide insights into our lending portfolio's overall cost.

5. Average Debt-to-Income Ratio (DTI):

Evaluating the average DTI for our borrowers helps us gauge their financial health. We need to compute the average DTI for all loans, MTD, and track MONTH-over-Month fluctuations.

Functionalities Will Be Using

SQL – MS SQL Server

1. Creating database
2. Creating table
3. Select
4. Datename
5. Datepart
6. Cast
7. Decimal
8. Month
9. Hour
10. Quarter
11. Day
12. Group By
13. Order By
14. Decimal
15. Limit
16. Count
17. Distinct
18. CTE
19. Partition

POWER BI

1. Connecting to SQL Server
2. Data Cleaning
3. Data Modelling
4. Data Processing
5. Power Query
6. Date Tables
7. Time Intelligence Func
8. DAX
9. Date Function
10. Text Function
11. Filter Function
12. Calculate
13. SUM/SUMX
14. Creating KPI's
15. New Card Visual
16. Creating charts
17. Formatting visuals
18. Creating Functions
19. Navigations

Domain Knowledge

Bank loans are a crucial financial tool that enables individuals and businesses to achieve their goals and manage financial needs. However, it's essential for borrowers to understand the terms, costs, and responsibilities associated with loans to make informed financial decisions.

Banks collect loan data through various channels and processes, including:

Loan Applications:

When individuals or businesses apply for loans, they submit detailed applications that include personal and financial information. This data is collected electronically or in paper form.

Credit Reports:

Banks often access credit reports from credit bureaus when assessing a borrower's creditworthiness. These reports contain information about a person's credit history, existing loans, and payment behaviour.

Internal Records:

Banks maintain internal records of loan transactions, including disbursements, repayments, and loan status changes. These records are generated and stored in the bank's database.

Online Portals:

Many banks offer online platforms where borrowers can apply for loans, make payments, and access account information. Data from these portals is collected and stored for analysis.

Third-party Data Sources:

Some banks may use external data sources, such as income verification services, to gather additional information about borrowers.

Process of Granting a Loan

Loan Application:

The process begins when a customer submits a loan application to a bank or lending institution. This application can be submitted in person, online, or through other channels.

Application Review:

The lending institution reviews the loan application and collects necessary documentation, such as income statements, credit reports, and identification documents.

Identity Verification:

One of the initial checks is to verify the applicant's identity. This helps ensure that the applicant is who they claim to be and prevents identity theft.

Credit Check:

A crucial step is to perform a credit check on the applicant. This involves accessing their credit report from credit bureaus. Lenders evaluate the applicant's credit history, credit score, and any past delinquencies or defaults.

Income Verification:

Lenders assess the applicant's ability to repay the loan by verifying their income. This may involve reviewing pay stubs, tax returns, or other income documentation.

Debt-to-Income Ratio (DTI) Check:

Lenders calculate the applicant's DTI, which is the ratio of their monthly debt payments to their monthly income. A lower DTI indicates better repayment capacity.

Employment Verification:

Lenders may contact the applicant's employer to verify their employment status and length of employment. Stable employment history is often seen as a positive factor.

Collateral Assessment (if applicable):

If the loan is secured by collateral, such as a home or a car, the lender evaluates the value and condition of the collateral.

Risk Assessment:

Lenders assess the overall risk associated with the loan. This includes considering the applicant's credit risk, income stability, and the purpose of the loan.

Loan Approval or Denial:

Based on the information gathered and the risk assessment, the lender makes a decision to approve or deny the loan application. If approved, the lender determines the loan amount, interest rate, and terms.

Loan Agreement:

If the loan is approved, the lender provides the applicant with a loan agreement that outlines the terms and conditions, including the interest rate, repayment schedule, and any fees.

Disbursement of Funds:

Once the loan agreement is signed by both parties, the lender disburses the funds to the borrower. The borrower can use the funds for the specified purpose.

Repayment:

The borrower is responsible for making regular loan payments as specified in the loan agreement. This includes repaying the principal amount along with interest.

Ongoing Monitoring:

Lenders continue to monitor the loan throughout its term, including tracking payments, assessing the borrower's financial health, and managing any delinquencies or defaults.

Reasons for Analysing Bank Loan Data:

Banks analyse loan data for several critical reasons:

Risk Assessment:

One of the primary purposes of analysing loan data is to assess the risk associated with lending to a particular individual or business. Banks use data to evaluate the creditworthiness of borrowers, predict default probabilities, and determine interest rates and lending terms.

Decision-making:

Loan data analysis supports the decision-making process when evaluating loan applications. Banks use data-driven models and algorithms to make informed lending decisions, such as approving or denying loan requests.

Portfolio Management:

Banks manage portfolios of loans, including mortgages, personal loans, and business loans. Data analysis helps banks monitor the health of these portfolios, identify underperforming loans, and optimize loan terms and pricing.

Fraud Detection:

Banks use data analysis to detect fraudulent loan applications and activities. Unusual patterns, inconsistencies, or discrepancies in loan data can trigger fraud alerts.

Regulatory Compliance:

Banks are subject to regulatory requirements that mandate the collection and reporting of loan data. Compliance with regulations such as the Home Mortgage Disclosure Act (HMDA) and the Know Your Customer (KYC) regulations requires data analysis and reporting.

Customer Insights:

Analysing loan data provides insights into customer behaviour, preferences, and needs. Banks can use these insights to tailor loan products and marketing strategies to specific customer segments.

Profitability Analysis:

Banks assess the profitability of their loan portfolios by analysing data related to interest income, loan origination costs, default rates, and collection efforts.

Market Research:

Data analysis helps banks understand market trends, competitive landscape, and customer demand. This information guides product development and market expansion strategies.

Credit Risk Management:

Banks continuously monitor and manage credit risk associated with their loans. Data analysis helps in setting risk management strategies, provisioning for potential losses, and stress testing loan portfolios.

Customer Retention:

Banks use data analysis to identify opportunities for retaining existing customers, such as offering loan refinancing options or additional financial products.

Bank Loan Report Query Document

KPI's

Total Loan Application

```
SELECT COUNT(id) AS MTD_Total_Loan_Applications
FROM bank_loan_data
```

	Total_Loan_Applications
1	38576

Mont-to-Date Loan Application

```
SELECT COUNT(id) AS MTD_Total_Loan_Applications
FROM bank_loan_data
WHERE MONTH(issue_date) = 12 AND YEAR(issue_date) = 2021
```

	MTD_Total_Loan_Applications
1	4314

PMonth-to-Date Loan Application

```
SELECT COUNT(id) AS MTD_Total_Loan_Applications
FROM bank_loan_data
WHERE MONTH(issue_date) = 11 AND YEAR(issue_date) = 2021
```

	MTD_Total_Loan_Applications
1	4035

Total Funded Amount

```
SELECT SUM(loan_amount) AS Total_Funded_Amount
FROM bank_loan_data
```

	Total_Funded_Amount
1	435757075

MTD Total Funded Amount

```
SELECT SUM(loan_amount) AS MTD_Total_Funded_Amount
FROM bank_loan_data
WHERE MONTH(issue_date) = 12 AND YEAR(issue_date) = 2021
```

	MTD_Total_Funded_Amount
1	53981425

PMTD Total Funded Amount

```
SELECT SUM(loan_amount) AS MTD_Total_Funded_Amount
FROM bank_loan_data
WHERE MONTH(issue_date) = 11 AND YEAR(issue_date) = 2021
```

	MTD_Total_Funded_Amount
1	47754825

Total Amount Received

```
SELECT SUM(total_payment) AS Total_Amount_Received
FROM bank_loan_data
```

	Total_Amount_Received
1	473070933

MTD Total Amount Received

```
SELECT SUM(total_payment) AS Total_Amount_Received
FROM bank_loan_data
WHERE MONTH(issue_date) = 12 AND YEAR(issue_date) = 2021
```

	Total_Amount_Received
1	58074380

PMTD Total Amount Received

```
SELECT SUM(total_payment) AS Total_Amount_Received
FROM bank_loan_data
WHERE MONTH(issue_date) = 11 AND YEAR(issue_date) = 2021
```

	Total_Amount_Received
1	50132030

Average Interest Rate (%)

```
SELECT ROUND(AVG(int_rate) * 100,2) AS Avg_Int_Rate
FROM bank_loan_data
```

	Avg_Int_Rate
1	12.05

MTD Average Interest (%)

```
SELECT ROUND(AVG(int_rate) * 100,2) AS Avg_Int_Rate
FROM bank_loan_data
WHERE MONTH(issue_date) = 12
```

	Avg_Int_Rate
1	12.36

PMTD Average Interest

```
SELECT ROUND(AVG(int_rate) * 100,2) AS Avg_Int_Rate
FROM bank_loan_data
WHERE MONTH(issue_date) = 11
```

	Avg_Int_Rate
1	11.94

Average Debt-to-Income Ratio (%)

```
SELECT AVG(dti) * 100 AS Avg_DTI
FROM bank_loan_data
```

	Avg_DTI
1	13.3274331211432

MTD Average Debt-to-Income Ratio (%)

```
SELECT AVG(dti) * 100 AS Avg_DTI
FROM bank_loan_data
WHERE MONTH(issue_date) = 12
```

	Avg_DTI
1	13.6655377880425

PMTD Average Debt_to_Income Ratio(%)

```
SELECT AVG(dti) * 100 AS Avg_DTI
FROM bank_loan_data
WHERE MONTH(issue_date) = 11
```

	Avg_DTI
1	13.3027335836364

GOOD LOAN ISSUED

Good Loan Percentage (%)

*note: considering 'Fully Paid' and 'Current' loan status as included in as a good loan

-- to check the unique values inside the loan_status column

```
SELECT DISTINCT(loan_status)
FROM bank_loan_data
```

-- find the good loan considering the status assigned

```
SELECT CAST(ROUND((COUNT(CASE WHEN loan_status = 'Fully_Paid' OR loan_status = 'Current' THEN id
END) * 100.0) / COUNT(id),2) AS DECIMAL(10,2)) AS Good_Loan_Percentage
FROM bank_loan_data
```

	Good_Loan_Percentage
1	86.18

Good Loan Applications

```
SELECT COUNT(id) AS Good_Loan_Application
FROM bank_loan_data
WHERE loan_status = 'Fully_Paid' OR loan_status = 'Current'
```

	Good_Loan_Application
1	33243

Good Loan Funded Amount

```
SELECT SUM(loan_amount) AS Good_Loan_Funded_Amount
FROM bank_loan_data
WHERE loan_status = 'Fully Paid' OR loan_status = 'Current'
```

	Good_Loan_Funded_Amount
1	370224850

Good Loan Amount Received

```
SELECT SUM(total_payment) AS Good_Loan_Amount_Received
FROM bank_loan_data
WHERE loan_status = 'Fully Paid' OR loan_status = 'Current'
```

	Good_Loan_Amount_Received
1	435786170

BAD LOAN ISSUED

Bad Loan Percentage (%)

-- checking unqiue values in loan_status column

```
SELECT DISTINCT(loan_status) AS type_of_status
FROM bank_loan_data
```

```
SELECT
```

```
    CAST(ROUND((COUNT(CASE WHEN loan_status = 'Charged Off' THEN id END) * 100.0) /
    COUNT(id), 2) AS DECIMAL (10,2)) AS Bad_Loan_Percentage
FROM bank_loan_data
```

	Bad_Loan_Percentage
1	13.82

Bad Loan Application

```
SELECT COUNT(loan_status) AS Bad_Loan_Application
FROM bank_loan_data
WHERE loan_status = 'Charged Off'
```

	Bad_Loan_Application
1	5333

Bad Loan Funded Amount

```
SELECT SUM(loan_amount) AS Bad_Loan_Funded_Amount
FROM bank_loan_data
WHERE loan_status = 'Charged Off'
```

	Bad_Loan_Funded_Amount
1	65532225

Bad Loan Amount Received

```
SELECT SUM(total_payment) AS Bad_Loan_Amount_Received
FROM bank_loan_data
WHERE loan_status = 'Charged Off'
```

	Bad_Loan_Amount_Received
1	37284763

LOAN STATUS

```
SELECT
```

```
    loan_status,
    COUNT(id) AS Loan_Count,
    SUM(total_payment) AS Total_Payment_Received,
    SUM(loan_amount) AS Total_Funded_Amount,
    AVG(int_rate * 100) AS Interest_Rate,
    AVG(dti * 100) AS DTI
FROM bank_loan_data
GROUP BY loan_status
```

	loan_status	Loan_Count	Total_Payment_Received	Total_Funded_Amount	Interest_Rate	DTI
1	Fully Paid	32145	411586256	351358350	11.6410707918092	13.1673507557434
2	Charged Off	5333	37284763	65532225	13.8785749318289	14.0047328005517
3	Current	1098	24199914	18866500	15.0993260800947	14.7243442736843

```

SELECT
    loan_status,
    SUM(total_payment) AS MTD_Total_Amount_Received,
    SUM(loan_amount) AS MTD_Total_Funded_Amount

FROM bank_loan_data
GROUP BY loan_status

```

	loan_status	MTD_Total_Amount_Received	MTD_Total_Funded_Amount
1	Fully Paid	411586256	351358350
2	Charged Off	37284763	65532225
3	Current	24199914	18866500

BANK LOAN REPORT | OVERVIEW

MONTH

```

SELECT
    MONTH(issue_date) AS Month_Number,
    DATENAME(MONTH, issue_date) AS Month_Name,
    COUNT(id) AS Total_Loan_Applications,
    SUM(loan_amount) AS Total_Funded_Amount,
    SUM(total_payment) AS Total_Amount_Received

FROM bank_loan_data
GROUP BY MONTH(issue_date), DATENAME(MONTH, issue_date)
ORDER BY MONTH(issue_date)

```

	Month_Number	Month_Name	Total_Loan_Applications	Total_Funded_Amount	Total_Amount_Received
1	1	January	2332	25031650	27578836
2	2	February	2279	24647825	27717745
3	3	March	2627	28875700	32264400
4	4	April	2755	29800800	32495533
5	5	May	2911	31738350	33750523
6	6	June	3184	34161475	36164533
7	7	July	3366	35813900	38827220
8	8	August	3441	38149600	42682218
9	9	September	3536	40907725	43983948
10	10	October	3796	44893800	49399567
11	11	November	4035	47754825	50132030
12	12	December	4314	53981425	58074380

STATE

SELECT

```
    address_state AS State,  
    COUNT(id) AS Total_Loan_Applications,  
    SUM(loan_amount) AS Total_Funded_Amount,  
    SUM(total_payment) AS Total_Amount_Received
```

FROM bank_loan_data

GROUP BY address_state

ORDER BY address_state

	State	Total_Loan_Applications	Total_Funded_Amount	Total_Amount_Received
15	IL	1486	17124225	18875941
16	IN	9	86225	85521
17	KS	260	2872325	3247394
18	KY	320	3504100	3792530
19	LA	426	4498900	5001160
20	MA	1310	15051000	16676279
21	MD	1027	11911400	12985170
22	ME	3	9200	10808
23	MI	685	7829900	8543660
24	MN	592	6302600	6750746
25	MO	660	7151175	7692732
26	MS	19	139125	149342
27	MT	79	829525	892047
28	NC	759	8787575	9534813
29	NE	5	31700	24542
30	NH	161	1917900	2101386
31	NJ	1822	21657475	23425159
32	NM	183	1916775	2084485
33	NV	482	5307375	5451443
34	NY	3701	42077050	46108181
35	OH	1188	12991375	14330148
36	OK	293	3365725	3712649
37	OR	436	4720150	4966903
38	PA	1482	15826525	17462908
39	RI	196	1883025	2001774
40	SC	464	5080475	5462458
41	SD	63	606150	656514
42	TN	17	162175	141522
43	TX	2664	31236650	34392715
44	UT	252	2849225	2952412
45	VA	1375	15982650	17711443
46	VT	54	504100	534973
47	WA	805	8855525	9531739
48	WI	446	5070450	5485161
49	WV	167	1830525	1991936
50	WY	79	890750	1046050

TERM

SELECT

```
term AS Term,  
COUNT(id) AS Total_Loan_Applications,  
SUM(loan_amount) AS Total_Funded_Amount,  
SUM(total_payment) AS Total_Amount_Received
```

FROM bank_loan_data

GROUP BY term

ORDER BY term

	Term	Total_Loan_Applications	Total_Funded_Amount	Total_Amount_Received
1	36 months	28237	273041225	294709458
2	60 months	10339	162715850	178361475

EMPLOYEE LENGTH

SELECT

```
emp_length AS Employee_Length,  
COUNT(id) AS Total_Loan_Applications,  
SUM(loan_amount) AS Total_Funded_Amount,  
SUM(total_payment) AS Total_Amount_Received
```

FROM bank_loan_data

GROUP BY emp_length

ORDER BY emp_length

	Employee_Length	Total_Loan_Applications	Total_Funded_Amount	Total_Amount_Received
1	< 1 year	4575	44210625	47545011
2	1 year	3229	32883125	35498348
3	10+ years	8870	116115950	125871616
4	2 years	4382	44967975	49206961
5	3 years	4088	43937850	47551832
6	4 years	3428	37600375	40964850
7	5 years	3273	36973625	40397571
8	6 years	2228	25612650	27908658
9	7 years	1772	20811725	22584136
10	8 years	1476	17558950	19025777
11	9 years	1255	15084225	16516173

PURPOSE

SELECT

```
purpose AS PURPOSE,  
COUNT(id) AS Total_Loan_Applications,  
SUM(loan_amount) AS Total_Funded_Amount,  
SUM(total_payment) AS Total_Amount_Received
```

FROM bank_loan_data

GROUP BY purpose

ORDER BY purpose

	PURPOSE	Total_Loan_Applications	Total_Funded_Amount	Total_Amount_Received
1	car	1497	10223575	11324914
2	credit card	4998	58885175	65214084
3	Debt consolidation	18214	232459675	253801871
4	educational	315	2161650	2248380
5	home improvement	2876	33350775	36380930
6	house	366	4824925	5185538
7	major purchase	2110	17251600	18676927
8	medical	667	5533225	5851372
9	moving	559	3748125	3999899
10	other	3824	31155750	33289676
11	renewable_energy	94	845750	898931
12	small business	1776	24123100	23814817
13	vacation	352	1967950	2116738
14	wedding	928	9225800	10266856

HOME OWNERSHIP

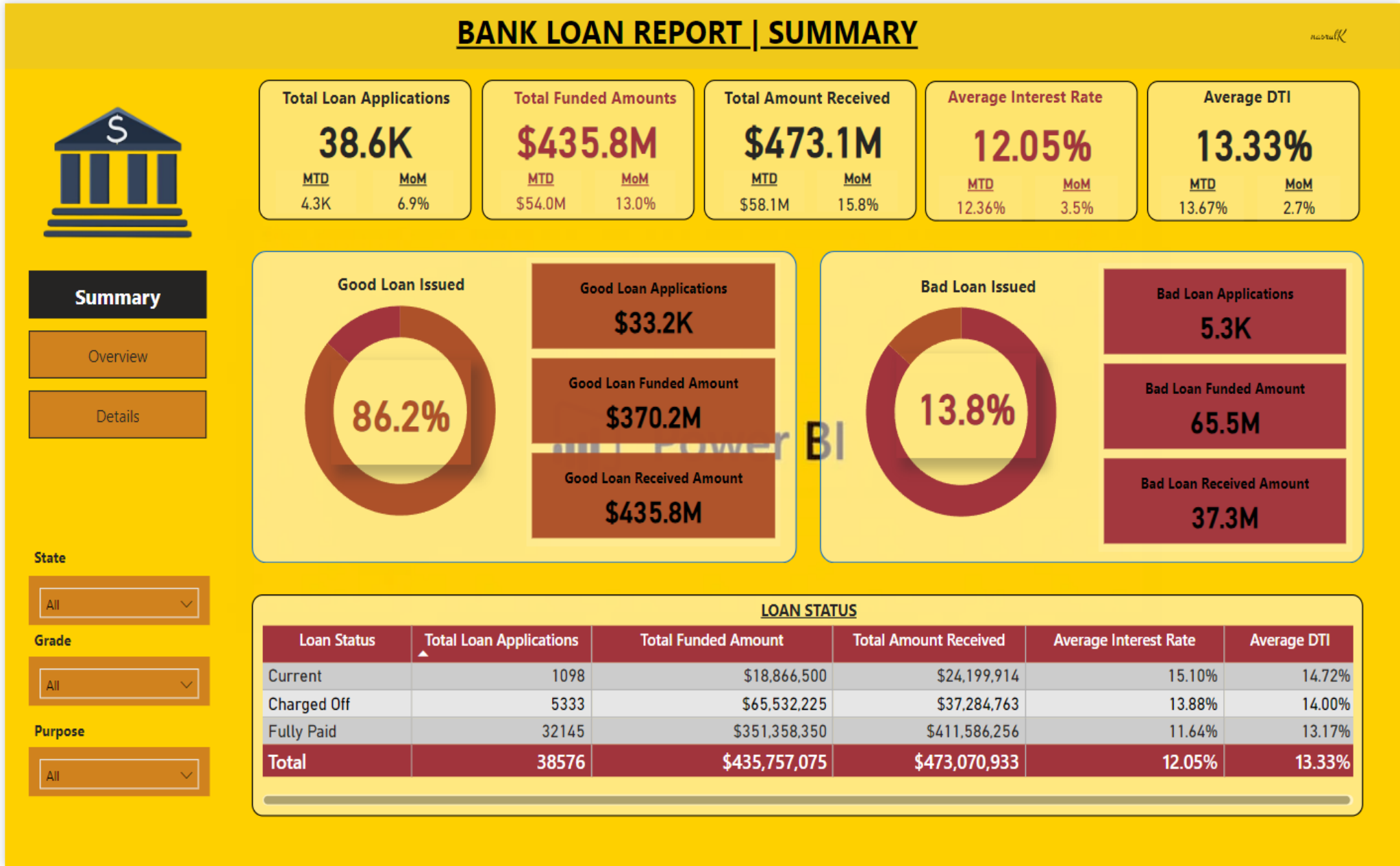
```

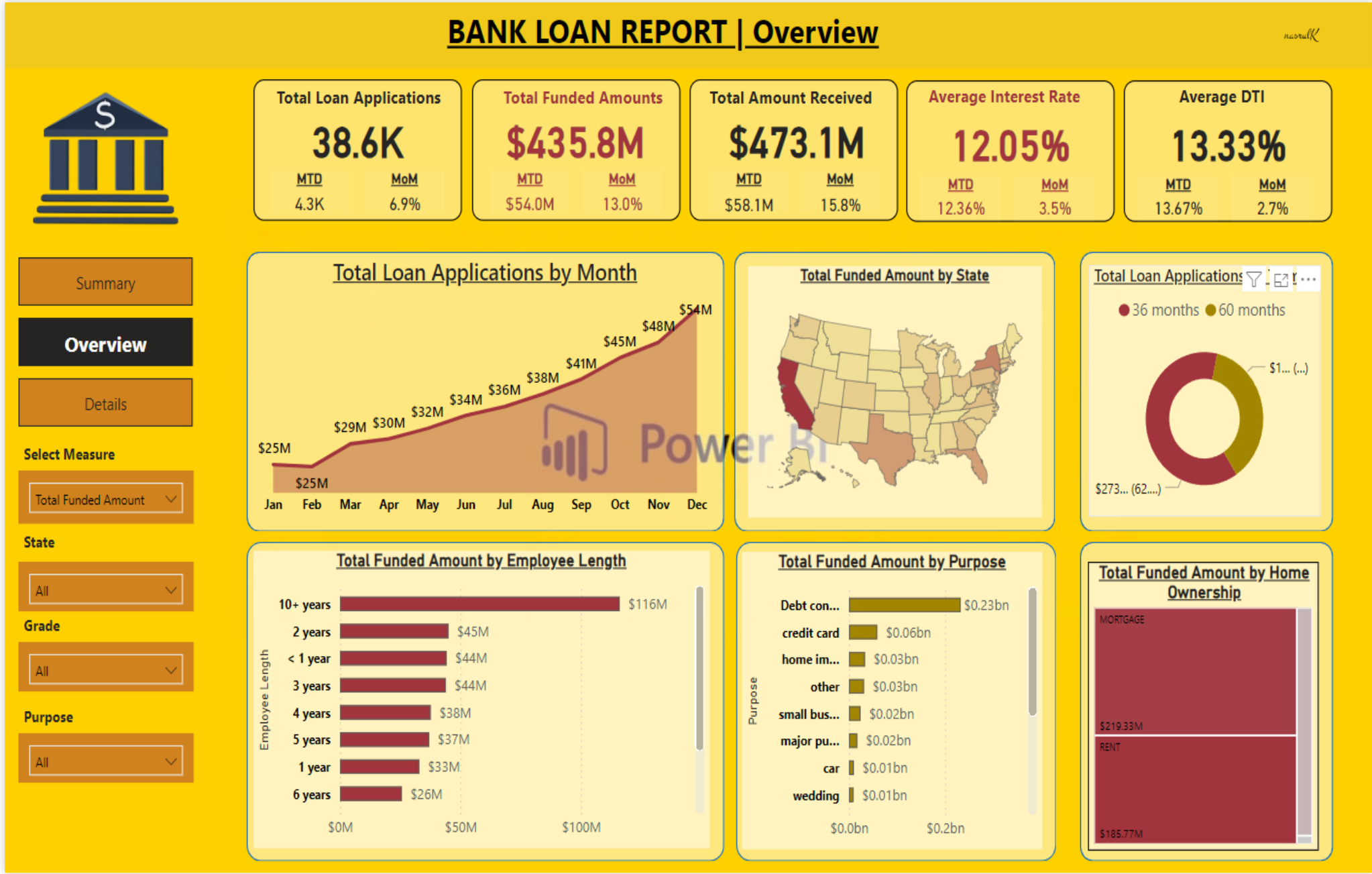
SELECT
    home_ownership AS Home_Ownership,
    COUNT(id) AS Total_Loan_Applications,
    SUM(loan_amount) AS Total_Funded_Amount,
    SUM(total_payment) AS Total_Amount_Received
FROM bank_loan_data
GROUP BY home_ownership
ORDER BY home_ownership

```

	Home_Ownership	Total_Loan_Applications	Total_Funded_Amount	Total_Amount_Received
1	MORTGAGE	17198	219329150	238474438
2	NONE	3	16800	19053
3	OTHER	98	1044975	1025257
4	OWN	2838	29597675	31729129
5	RENT	18439	185768475	201823056

Summary





Summary

Overview

Details

Select Measure

Total Funded Amount

State

All

Grade

All

Purpose

All

Total Loan Applications

38.6K

MTD4.3K MoM6.9%

Total Funded Amounts

\$435.8M

MTD\$54.0M MoM13.0%

Total Amount Received

\$473.1M

MTD\$58.1M MoM15.8%

Average Interest Rate

12.05%

MTD12.36% MoM3.5%

Average DTI

13.33%

MTD13.67% MoM2.7%

Filter

Export

More

ID	Purpose	Home Ownership	Grade	Issue Date	Total Funded Amount	Total Interest Rate	Sum of installment	Total Amount Received
1077501	credit card	RENT	B	11 December, 2021	\$5,000	10.65%	162.87	\$5,863
1077430	car	RENT	C	11 February, 2021	\$2,500	15.27%	59.83	\$1,009
1077175	small business	RENT	C	11 December, 2021	\$2,400	15.96%	84.33	\$3,006
1076863	other	RENT	C	11 December, 2021	\$10,000	13.49%	339.31	\$12,232
1075358	other	RENT	B	11 December, 2021	\$3,000	12.69%	67.79	\$3,513
1075269	wedding	RENT	A	11 December, 2021	\$5,000	7.90%	156.46	\$5,632
1072053	car	RENT	E	1 January, 2021	\$3,000	18.64%	109.43	\$3,939
1071795	small business	OWN	F	11 December, 2021	\$5,600	21.28%	152.39	\$646
1071570	other	RENT	B	11 December, 2021	\$5,375	12.69%	121.45	\$1,476
1070078	Debt consolidation	OWN	C	11 December, 2021	\$6,500	14.65%	153.45	\$7,678
1069971	major purchase	MORTGAGE	A	11 December, 2021	\$3,600	6.03%	109.57	\$3,785
1069908	Debt consolidation	OWN	B	11 December, 2021	\$12,000	12.69%	402.54	\$13,948
1069866	credit card	RENT	B	11 December, 2021	\$3,000	9.91%	96.68	\$3,480
1069799	Debt consolidation	MORTGAGE	B	11 December, 2021	\$4,000	11.71%	132.31	\$4,486
1069759	Debt consolidation	RENT	D	11 December, 2021	\$1,000	16.29%	35.31	\$1,271
1069742	Debt consolidation	RENT	A	11 December, 2021	\$9,200	6.03%	280.01	\$9,460
1069740	Debt consolidation	RENT	C	11 December, 2021	\$20,250	15.27%	484.63	\$27,679
1069710	credit card	OWN	B	11 December, 2021	\$10,000	11.71%	330.76	\$11,907
1069700	Debt consolidation	RENT	B	11 December, 2021	\$10,000	11.71%	330.76	\$11,541