# BANK LOAN REPORT

## Problem Statement

We need a comprehensive Bank Loan Report to monitor and assess our bank's lending activities. This report will provide insights into key loan-related metrics and their changes over time, enabling data-driven decisions and trend identification.
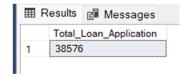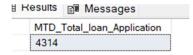
## Dashboard 1: Summary:

**KPI Requirements**

1. **Total Loan Applications**: Calculate total applications, track Month-to-Date (MTD) applications, and changes Month-over-Month (MoM).

   **Query (TOTAL):** `select count(id) as Total_Loan_Application from financial_loan_New`

   **Output:**

   

   **Query (MTD):** `select count(id) as MTD_Total_loan_Application from financial_loan_New`

   `where MONTH(issue_date) = 12 and YEAR(issue_date)=2021`

   **Output:**

   

   **Query (MoM):**
   ```sql
   SELECT Month11.Total_Loan_Applications AS Month11_Applications,
   Month12.Total_Loan_Applications AS Month12_Applications, FORMAT(((1.0 *
   Month12.Total_Loan_Applications - Month11.Total_Loan_Applications) /
   NULLIF(Month11.Total_Loan_Applications, 0)) * 100, 'N2') AS MoM_Change_Percentage
   FROM
   (SELECT COUNT(id) AS Total_Loan_Applications FROM financial_loan_New WHERE
   Issue_Date BETWEEN '2021-11-01' AND '2021-11-30') AS Month11,
   (SELECT COUNT(id) AS Total_Loan_Applications FROM financial_loan_New WHERE
   Issue_Date BETWEEN '2021-12-01' AND '2021-12-31') AS Month12;
   ```
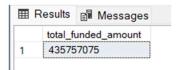
**Output:**

| | Month11_Applications | Month12_Applications | MoM_Change_Percentage |
|---|---|---|---|
| 1 | 4035 | 4314 | 6.91 |

2. **Total Funded Amount**: Monitor total disbursed loans, MTD funded amounts, and MoM changes.

**Query (TOTAL):** `select SUM(loan_amount) as total_funded_amount from financial_loan_New`

**Output:**

| | total_funded_amount |
|---|---|
| 1 | 435757075 |

**Query (MTD):** `select SUM(loan_amount) as MTD_total_funded_amount from financial_loan_New`
`where MONTH(issue_date)=12 and YEAR(issue_date)=2021`

**Output:**

| | total_funded_amount |
|---|---|
| 1 | 53981425 |

**Query (MoM):**
```
SELECT Month11.total_funded_amount AS Month11_Funded_Amount,
Month12.total_funded_amount AS Month12_Funded_Amount,
FORMAT(((1.0 * Month12.total_funded_amount - Month11.total_funded_amount) /
NULLIF(Month11.total_funded_amount, 0)) * 100, 'N2') AS MoM_Change_Percentage
FROM
(SELECT SUM(loan_amount) AS total_funded_amount FROM financial_loan_New WHERE
Issue_Date BETWEEN '2021-11-01' AND '2021-11-30') AS Month11,
(SELECT SUM(loan_amount) AS total_funded_amount FROM financial_loan_New WHERE
Issue_Date BETWEEN '2021-12-01' AND '2021-12-31') AS Month12;
```

**Output:**

| | Month11_Funded_Amount | Month12_Funded_Amount | MoM_Change_Percentage |
|---|---|---|---|
| 1 | 47754825 | 53981425 | 13.04 |

3. **Total Amount Received**: Track total received from borrowers, MTD amounts received, and MoM changes.

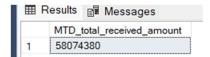**Query (TOTAL)**: select SUM(total_payment) as total_received_amount from financial_loan_New

**Output:**

| | total_received_amount |
|---|---|
| 1 | 473070933 |

**Query (MTD)**: select SUM(total_payment) as MTD_total_received_amount from financial_loan_New
where MONTH(issue_date)=12 and YEAR(issue_date)=2021

**Output:**

| | MTD_total_received_amount |
|---|---|
| 1 | 58074380 |

**Query (MoM)**: SELECT Month11.total_received_amount AS Month11_Received_Amount, Month12.total_received_amount AS Month12_Received_Amount, FORMAT(((1.0 * Month12.total_received_amount - Month11.total_received_amount) / NULLIF(Month11.total_received_amount, 0)) * 100, 'N2') AS MoM_Change_Percentage
FROM
(SELECT SUM(total_payment) AS total_received_amount FROM financial_loan_New WHERE Issue_Date BETWEEN '2021-11-01' AND '2021-11-30') AS Month11,
(SELECT SUM(total_payment) AS total_received_amount FROM financial_loan_New WHERE Issue_Date BETWEEN '2021-12-01' AND '2021-12-31') AS Month12;

**Output:**

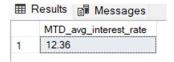| | Month11_Received_Amount | Month12_Received_Amount | MoM_Change_Percentage |
|---|---|---|---|
| 1 | 50132030 | 58074380 | 15.84 |

4. **Average Interest Rate**: Calculate average interest rate across loans, MTD, and MoM variations.

**Query (TOTAL)**: select ROUND(AVG(int_rate),4)*100 as avg_interest_rate from financial_loan_New

**Output:**

| | avg_interest_rate |
|---|---|
| 1 | 12.05 |

**Query (MTD):** `select ROUND(AVG(int_rate),4)*100 as MTD_avg_interest_rate from financial_loan_New`
`where MONTH(issue_date)=12 and YEAR(issue_date)=2021`

**Output:**

⊞ Results ▣ Messages

| | MTD_avg_interest_rate |
|---|---|
| 1 | 12.36 |

**Query (MoM):** `SELECT`
`Month11.avg_interest_rate AS Month11_Interest_rate,`
`Month12.avg_interest_rate AS Month12_Interest_rate,`
`FORMAT(((1.0 * Month12.avg_interest_rate - Month11.avg_interest_rate) /`
`NULLIF(Month11.avg_interest_rate, 0)), 'N2') AS MoM_Change`
`FROM`
`(SELECT AVG(int_rate) AS avg_interest_rate FROM financial_loan_New WHERE`
`Issue_Date BETWEEN '2021-11-01' AND '2021-11-30') AS Month11,`
`(SELECT AVG(int_rate) AS avg_interest_rate FROM financial_loan_New WHERE`
`Issue_Date BETWEEN '2021-12-01' AND '2021-12-31') AS Month12;`

**Output:**

| | Month11_Interest_rate | Month12_Interest_rate | MoM_Change |
|---|---|---|---|
| 1 | 0.119417175498261 | 0.123560408676042 | 0.03 |

5. **Average Debt-to-Income Ratio (DTI):** Evaluate average DTI, MTD, and MoM fluctuations.

**Query (TOTAL):** `select ROUND(AVG(dti),4) * 100 as Avg_DTI from financial_loan_New`

**Output:**

⊞ Results ▣ N

| | Avg_DTI |
|---|---|
| 1 | 13.33 |

**Query (MTD):** `select ROUND(AVG(dti),4) * 100 as MTD_Avg_DTI from financial_loan_New`
`where MONTH(issue_date)=12 and YEAR(issue_date)=2021`

**Output:**

| | MTD_Avg_DTI |
|---|---|
| 1 | 13.67 |

**Query (MoM)**: `SELECT Month11.avg_dti AS Month11_DTI, Month12.avg_dti AS Month12_DTI, FORMAT(((1.0 * Month12.avg_dti - Month11.avg_dti) / NULLIF(Month11.avg_dti, 0) * 100), 'N2') AS MoM_Change FROM (SELECT AVG(dti) * 100 AS avg_dti FROM financial_loan_New WHERE Issue_Date BETWEEN '2021-11-01' AND '2021-11-30') AS Month11, (SELECT AVG(dti) *100 AS avg_dti FROM financial_loan_New WHERE Issue_Date BETWEEN '2021-12-01' AND '2021-12-31') AS Month12;`

**Output:**

| | Month11_DTI | Month12_DTI | MoM_Change |
|---|---|---|---|
| 1 | 13.3027335836364 | 13.6655377880425 | 2.73 |

**Good Loan vs. Bad Loan KPIs**

*Good Loan KPIs:*

1. **Good Loan Application Percentage**: Percentage of 'Fully Paid' and 'Current' loans.

   **Query**: `select (COUNT(case when loan_status = 'Fully Paid' or loan_status = 'Current' then id end) * 100)/count(id) as Good_loan_percentage from financial_loan_New`

   **Output:**

   | | Good_loan_percentage |
   |---|---|
   | 1 | 86 |

2. **Good Loan Applications**: Total 'Fully Paid' and 'Current' loan applications.

   **Query**: `select count(id) as Good_loan_Application From financial_loan_New where loan_status = 'Fully Paid' OR loan_status = 'Current'`

   **Output:**

   | | Good_loan_Application |
   |---|---|
   | 1 | 33243 |

3. **Good Loan Funded Amount**: Total funds disbursed as 'Good Loans.'

   **Query**: `select sum(loan_amount) as Good_loan_Funded_amount From financial_loan_New where loan_status = 'Fully Paid' OR loan_status = 'Current'`

   **Output:**

   | | Good_loan_Funded_amount |
   |---|---|
   | 1 | 370224850 |

4. **Good Loan Total Received Amount**: Total received from 'Good Loans.'

   **Query**: `select sum(total_payment) as Good_loan_Recieved_amount From financial_loan_New where loan_status = 'Fully Paid' OR loan_status = 'Current'`

   **Output:**

   | | Good_loan_Recieved_amount |
   |---|---|
   | 1 | 435786170 |

*Bad Loan KPIs:*

1. **Bad Loan Application Percentage**: Percentage of 'Charged Off' loans.

   **Query**: `SELECT FORMAT((COUNT(CASE WHEN loan_status = 'Charged Off' THEN id END) * 100.0) / COUNT(id), 'N2') AS bad_loan_percentage FROM financial_loan_New;`

   **Output:**

   | | bad_loan_percentage |
   |---|---|
   | 1 | 13.82 |

2. **Bad Loan Applications**: Total 'Charged Off' loan applications.

   **Query**: `SELECT COUNT(id) AS bad_loan_Application FROM financial_loan_New WHERE loan_status = 'Charged Off'`

   **Output:**

   | | bad_loan_Application |
   |---|---|
   | 1 | 5333 |

3. **Bad Loan Funded Amount**: Total funds disbursed as 'Bad Loans.'

   **Query**: `SELECT SUM(loan_amount) AS bad_loan_Amount FROM financial_loan_New WHERE loan_status = 'Charged Off'`

   **Output:**

   | | bad_loan_Amount |
   |---|---|
   | 1 | 65532225 |

4. **Bad Loan Total Received Amount**: Total received from 'Bad Loans.'

   **Query**: `SELECT SUM(total_payment) AS bad_loan_Amount_Recieved FROM financial_loan_New WHERE loan_status = 'Charged Off'`

   **Output:**

   | | bad_loan_Amount_Recieved |
   |---|---|
   | 1 | 37284763 |

**Loan Status Grid View** Create a grid view report categorized by 'Loan Status' to analyze and understand metrics associated with different loan statuses.

**Query (Total)**: `Select loan_status, COUNT(id) AS Total_Loan_Application, SUM(total_payment) as Total_amount_recieved, SUM(loan_amount) AS Total_Funded_Amount, Avg(int_rate * 100) as Interest_Rate, Avg(dti * 100) as DTI`
`From financial_loan_New`
`group by loan_status`

**Output:**

| | loan_status | Total_Loan_Application | Total_amount_recieved | 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 |

**Query (MTD)**: `select loan_status, sum(total_payment) as MTD_amount_Received, sum(loan_amount) as MTD_Funded_Amount`
`From financial_loan_New`
`Where MONTH(issue_date)=12`
`group by loan_status`

**Output:**



# Dashboard 2: Overview:

The Bank Loan Report project aims to visualize critical loan-related metrics using various chart types:

1. **Monthly Trends by Issue Date (Line Chart)**:
    o **Metrics**: 'Total Loan Applications,' 'Total Funded Amount,' 'Total Amount Received'
    o **Objective**: Identify seasonality and long-term trends.
    o **Query**: `Select MONTH(issue_date) AS Month_Number, DATENAME(MONTH,issue_date) AS Month_Name, COUNT(id) AS Total_Loan_Application, SUM(loan_amount) AS Total_Funded_Amount, SUM(total_payment) AS Total_Received_Amount FROM financial_loan_New Group By MONTH(issue_date),DATENAME(MONTH,issue_date) Order By MONTH(issue_date)`
    o **Output:**



2. **Regional Analysis by State (Filled Map)**:
    o **Metrics**: 'Total Loan Applications,' 'Total Funded Amount,' 'Total Amount Received'
    o **Objective**: Identify regional lending activity and disparities.

- o **Query**: `Select address_state, COUNT(id) AS Total_Loan_Application, SUM(loan_amount) AS Total_Funded_Amount, SUM(total_payment) AS Total_Received_Amount FROM financial_loan_New Group By address_state Order By SUM(loan_amount) DESC`
- o **Output:**

| | address_state | Total_Loan_Application | Total_Funded_Amount | Total_Received_Amount |
|---|---|---|---|---|
| 1 | CA | 6894 | 78484125 | 83901234 |
| 2 | NY | 3701 | 42077050 | 46108181 |
| 3 | TX | 2664 | 31236650 | 34392715 |
| 4 | FL | 2773 | 30046125 | 31601905 |
| 5 | NJ | 1822 | 21657475 | 23425159 |
| 6 | IL | 1486 | 17124225 | 18875941 |
| 7 | VA | 1375 | 15982650 | 17711443 |
| 8 | PA | 1482 | 15826525 | 17462908 |
| 9 | GA | 1355 | 15480325 | 16728040 |
| 10 | MA | 1310 | 15051000 | 16676279 |
| 11 | OH | 1188 | 12991375 | 14330148 |
| 12 | MD | 1027 | 11911400 | 12985170 |
| 13 | AZ | 833 | 9206000 | 10041986 |
| 14 | CO | 770 | 8976000 | 9845810 |
| 15 | WA | 805 | 8855525 | 9531739 |
| 16 | NC | 759 | 8787575 | 9534813 |

3. **Loan Term Analysis (Donut Chart)**:
   - o **Metrics**: 'Total Loan Applications,' 'Total Funded Amount,' 'Total Amount Received'
   - o **Objective**: Understand the distribution of loans across different term lengths.
   - o **Query**: `Select term, COUNT(id) AS Total_Loan_Application, SUM(loan_amount) AS Total_Funded_Amount, SUM(total_payment) AS Total_Received_Amount FROM financial_loan_New Group By term Order By term`
   - o **Output:**

| | term | Total_Loan_Application | Total_Funded_Amount | Total_Received_Amount |
|---|---|---|---|---|
| 1 | 36 months | 28237 | 273041225 | 294709458 |
| 2 | 60 months | 10339 | 162715850 | 178361475 |

4. **Employee Length Analysis (Bar Chart)**:
   - o **Metrics**: 'Total Loan Applications,' 'Total Funded Amount,' 'Total Amount Received'
   - o **Objective**: Assess impact of employment history on loan applications.
   - o **Query**: `Select emp_length, COUNT(id) AS Total_Loan_Application, SUM(loan_amount) AS Total_Funded_Amount, SUM(total_payment) AS Total_Received_Amount FROM financial_loan_New Group By emp_length Order By emp_length`

| | emp_length | Total_Loan_Application | Total_Funded_Amount | Total_Received_Amount |
|---|---|---|---|---|
| 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 |

5. **Loan Purpose Breakdown (Bar Chart)**:
   - o **Metrics**: 'Total Loan Applications,' 'Total Funded Amount,' 'Total Amount Received'
   - o **Objective**: Understand primary reasons borrowers seek financing.
   - o **Query**: Select purpose, COUNT(id) AS Total_Loan_Application, SUM(loan_amount) AS Total_Funded_Amount, SUM(total_payment) AS Total_Received_Amount FROM financial_loan_New Group By purpose Order By COUNT(id) DESC
   - o **Output:**

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

6. **Home Ownership Analysis (Tree Map)**:
   - o **Metrics**: 'Total Loan Applications,' 'Total Funded Amount,' 'Total Amount Received'
   - o **Objective**: View how home ownership impacts loan applications and disbursements.

- o **Query**: `Select home_ownership, COUNT(id) AS Total_Loan_Application, SUM(loan_amount) AS Total_Funded_Amount, SUM(total_payment) AS Total_Received_Amount FROM financial_loan_New Group By home_ownership Order By COUNT(id) DESC`
- o **Output:**

| | home_ownership | Total_Loan_Application | Total_Funded_Amount | Total_Received_Amount |
|---|---|---|---|---|
| 1 | RENT | 18439 | 185768475 | 201823056 |
| 2 | MORTGAGE | 17198 | 219329150 | 238474438 |
| 3 | OWN | 2838 | 29597675 | 31729129 |
| 4 | OTHER | 98 | 1044975 | 1025257 |
| 5 | NONE | 3 | 16800 | 19053 |

## Dashboard 3: Details:

A comprehensive 'Details Dashboard' will provide a holistic snapshot of key loan-related metrics and data points for efficient access to critical information.

**Query:**

```
select * from dbo.financial_loan_New
```

**Output:**

| | id | address_state | application_type | emp_length | emp_title | grade | home_ownership | issue_date | last_credit_pull_date | last_payment_date | loan_status | next_payment_date | member_id | purpose | sub_grade | term | verification_status | annual_incor |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 54734 | CA | INDIVIDUAL | < 1 year | NULL | B | RENT | 2021-08-09 | 2021-08-12 | 2021-10-11 | Fully Paid | 2021-11-11 | 80364 | Debt consolidation | B4 | 36 months | Verified | 85000 |
| 2 | 55742 | NY | INDIVIDUAL | < 1 year | CNN | B | RENT | 2021-05-08 | 2021-08-12 | 2021-06-11 | Fully Paid | 2021-07-11 | 114426 | credit card | B5 | 36 months | Not Verified | 65000 |
| 3 | 57245 | TX | INDIVIDUAL | 10+ years | city of beaumont texas | C | OWN | 2021-03-10 | 2021-05-16 | 2021-03-13 | Fully Paid | 2021-04-13 | 138150 | Debt consolidation | C2 | 36 months | Not Verified | 54000 |
| 4 | 57416 | CT | INDIVIDUAL | 6 years | State Farm Insurance | C | RENT | 2021-11-09 | 2021-05-16 | 2021-11-12 | Fully Paid | 2021-12-12 | 139635 | Debt consolidation | C3 | 36 months | Not Verified | 32000 |
| 5 | 58915 | CA | INDIVIDUAL | 3 years | QUalcomm Inc | B | RENT | 2021-04-08 | 2021-03-14 | 2021-04-11 | Fully Paid | 2021-05-11 | 153417 | Debt consolidation | B3 | 36 months | Not Verified | 85000 |
| 6 | 59006 | TX | INDIVIDUAL | 3 years | NULL | C | MORTGAGE | 2021-09-09 | 2021-09-12 | 2021-10-12 | Fully Paid | 2021-11-12 | 154254 | credit card | C5 | 36 months | Not Verified | 80800 |
| 7 | 61390 | TX | INDIVIDUAL | < 1 year | NULL | A | MORTGAGE | 2021-02-10 | 2021-03-12 | 2021-03-12 | Fully Paid | 2021-04-12 | 182594 | credit card | A5 | 36 months | Not Verified | 148000 |
| 8 | 61419 | MD | INDIVIDUAL | 1 year | Pension Benefit Guaranty Corporation | D | RENT | 2021-02-10 | 2021-03-13 | 2021-10-12 | Charged Off | 2021-11-12 | 182917 | Debt consolidation | D2 | 36 months | Not Verified | 45000 |
| 9 | 62102 | MA | INDIVIDUAL | 5 years | Rockwell Automation Inc. | B | RENT | 2021-04-10 | 2021-03-13 | 2021-02-11 | Fully Paid | 2021-03-11 | 191024 | Debt consolidation | B1 | 36 months | Not Verified | 54000 |
| 10 | 65426 | MI | INDIVIDUAL | < 1 year | Infotrieve, Inc. | B | MORTGAGE | 2021-08-09 | 2021-05-16 | 2021-06-11 | Charged Off | 2021-07-11 | 232106 | car | B1 | 36 months | Not Verified | 60000 |
| 11 | 65640 | CA | INDIVIDUAL | 10+ years | kmex/univision | C | MORTGAGE | 2021-05-08 | 2021-04-15 | 2021-05-11 | Fully Paid | 2021-06-11 | 234569 | home improvement | C2 | 36 months | Not Verified | 90000 |
| 12 | 66431 | KY | INDIVIDUAL | 3 years | Video Monitoring Services | B | RENT | 2021-02-09 | 2021-03-12 | 2021-03-12 | Fully Paid | 2021-04-12 | 243540 | Debt consolidation | B5 | 36 months | Not Verified | 27000 |
| 13 | 66749 | MS | INDIVIDUAL | 10+ years | crown cork & seal | C | MORTGAGE | 2021-12-08 | 2021-12-11 | 2021-01-12 | Fully Paid | 2021-02-12 | 246329 | Debt consolidation | C4 | 36 months | Not Verified | 34000 |
| 14 | 66943 | CA | INDIVIDUAL | < 1 year | The Coggins Co. | B | RENT | 2021-08-10 | 2021-07-14 | 2021-10-11 | Fully Paid | 2021-11-11 | 247802 | Debt consolidation | B4 | 60 months | Not Verified | 24000 |
| 15 | 66964 | KS | INDIVIDUAL | 3 years | Acquity | D | MORTGAGE | 2021-06-08 | 2021-06-11 | 2021-06-11 | Fully Paid | 2021-07-11 | 247990 | Debt consolidation | D3 | 36 months | Not Verified | 138000 |

Query executed successfully.     ALI\SQLEXPRESS (16.0 RTM)   ALI\alias (81)   FinancialDatabaseNew   00:00:01   38,576 rows