3 PowerBi Projects :- ( powerbi topics used)

1. ****Advanced Bank Loan Data Analysis: Empowering Decision-Making through Dynamic Insights****

**Problem Statement:** Advanced Dashboard Development for Loan Data Analysis. The current approach to loan data analysis lacks depth and interactivity, hindering the ability to derive meaningful insights for informed decision-making. Traditional reporting methods fall short in providing a comprehensive view of lending operations, borrower behavior, and loan performance metrics. There is a pressing need for advanced dashboard design to address these limitations and unlock the full potential of our loan data.

**Objective:** Our objective is to craft a suite of interconnected dashboards that deliver dynamic and comprehensive insights into our loan data, empowering decision-makers with actionable intelligence derived from robust data analysis. These dashboards are meticulously designed to offer a holistic perspective on our lending operations, borrower demographics, loan performance, and financial metrics, facilitating strategic decision-making based on data-driven insights.

****Dashboard 1: Executive Summary****

****Purpose:**** This dashboard provides an overview of critical Key Performance Indicators (KPIs) essential for evaluating the overall efficiency and performance of our lending endeavors.

**Key Features:**

* ****Total Loan Application****s: Monitor total and Month-to-Date (MTD) applications, scrutinizing Month-over-Month (MoM) trends for actionable insights.
* ****Total Funded Amount****: Evaluate the cumulative disbursed funds and track MTD disbursements, analyzing MoM variations to discern funding patterns.
* ****Total Amount Received****: Assess cash inflows via total and MTD received amounts from borrowers, scrutinizing MoM fluctuations for financial health assessment.
* ****Average Interest Rate****: Determine the cost of lending by computing and tracking the average interest rate across all loans, including MTD and MoM changes.
* ****Average Debt-to-Income Ratio (DTI)****: Evaluate borrowers' financial resilience by calculating the average DTI for all loans and monitoring MTD and MoM changes.

**Loan Performance Analysis:**

* Classify loans into "Good" and "Bad" categories based on specific KPIs such as application percentages, funded amounts, and received amounts.
* Implement a "Loan Status Grid View" for detailed categorization by loan status, providing insights into various metrics to support data-driven decision-making.

****Dashboard 2: Trends & Overview****

****Purpose:**** This dashboard offers interactive visualizations to illuminate lending trends, borrower demographics, and loan purposes, facilitating pattern recognition and opportunity identification.

**Key Visualizations:**

* Monthly Trends by Issue Date (Line Chart): Explore seasonality and long-term trends in lending activities.
* Regional Analysis by State (Filled Map): Highlight significant lending regions and analyze geographical disparities.
* Loan Term Analysis (Donut Chart): Understand the distribution of loans across different terms.
* Employment Length Analysis (Bar Chart): Assess the impact of employment history on lending metrics.
* Loan Purpose Breakdown (Bar Chart): Visualize the reasons behind borrowers' financing needs.
* Home Ownership Analysis (Tree Map): Examine the influence of home ownership on loan applications and disbursements.

****Dashboard 3: Detailed Insights****

****Purpose:**** This dashboard offers a deep dive into loan data, equipping users with comprehensive access to key metrics and loan details, empowering informed decision-making.

****Objective:**** The "Details Dashboard" serves as a user-friendly platform providing a comprehensive solution for in-depth analysis of the loan portfolio, augmenting our capacity to make informed lending decisions.

**Implementation Strategy:**

* Craft each dashboard with an intuitive layout to ensure seamless navigation and interaction.
* Integrate real-time data for up-to-the-minute analysis and decision-making.
* Incorporate user feedback mechanisms to continually refine and enhance dashboard functionalities.

By fulfilling these objectives, we aim to optimize our lending strategies, bolster financial health, and elevate borrower satisfaction through insightful data analysis and strategic dashboard design.

You're analyzing bank loan data across states, months, loan grades, status, and ownership to uncover patterns in loan approvals, funding, and repayments.

* Note: DTI- Debt to income ratio, MTD: Month to Date, MoM: Month over Month

**Low DTI (e.g. < 20%)** → Safer borrower → Higher chance of "Good Loan"

**High DTI (e.g. > 40%)** → Risky borrower → Higher chance of "Bad Loan"

- **MTD** tracks cumulative metrics **from the start of the current month up to today**.

- **MoM** compares a metric of the **current month** to the **previous month**.

* Note: CSV Data is already in table view of file. You have no need to keep other files like csv data files explicitly as they r already loaded into pbix file.

## 📊 ****KEY METRICS & DIMENSIONS****

### 1. ****States Involved****

Example: AZ, AL, AR, CA, CO, CT, etc.

These represent the geographic distribution of loan applications.

**Power BI Visuals:**  
🗺️ Map (Filled Map or Shape Map)  
📊 Stacked Column Chart by State  
📌 Use slicers to filter by state

### 2. ****Grade (A to G)****

Loan grades from A (best) to G (riskier).

Usually based on creditworthiness.

**Power BI Visuals:**  
🟢 Bar Chart or Donut Chart  
🧮 Add count of applications per grade  
🟨 Filter/slice by grade

### 3. ****Loan Status****

Good Loan vs Bad Loan

Good: Fully Paid

Bad: Charged Off, Defaulted

Also check loan\_status field

**Power BI Visuals:**  
✅❌ Pie Chart or Stacked Column  
🧾 Table with loan status details  
➕ Card to show % of Good vs Bad Loans

### 4. ****Time Analysis – Monthly/Yearly Trends****

Track number of applications/funding over time

**Power BI Visuals:**  
📈 Line Chart or Area Chart  
📅 Date Hierarchy (Year > Month > Day)  
Filter by issue\_d or application\_date

### 5. ****Loan Term****

Typically 36 months or 60 months

**Power BI Visuals:**  
📊 Stacked Column (Term vs Loan Status)  
🧮 Table grouped by Term

### 6. ****Total Loan Applications****

**Power BI Visuals:**  
🔢 Card with COUNT of loan\_id  
🟢 Bar Chart by State or Grade

### 7. ****Total Funded Amount****

**Power BI Visuals:**  
💵 Card with SUM of funded\_amnt  
📊 Column Chart by State/Month

### 8. ****Total Amount Received****

What borrower has paid so far

**Power BI Visuals:**  
💰 Card with SUM of total\_rec\_prncp  
📊 Grouped Bar Chart by State/Month

### 9. ****Average Interest Rate****

How costly the loan is on average

**Power BI Visuals:**  
📉 Gauge or KPI Card  
📈 Line Chart showing trend by Grade or Month

### 10. ****Average DTI (Debt-to-Income Ratio)****

**Power BI Visuals:**  
🧮 KPI Card or Bar Chart by State/Grade  
➕ Good to compare against loan status

### 11. ****Good vs Bad Loan Applications, Issued, Funded, Received****

Break down:

Number of applications marked good/bad

Funded amount for each category

Amount received

**Power BI Visuals:**  
✅❌ Stacked Column Charts  
📊 Bar Chart (Good vs Bad vs Metrics)  
🗂️ Use loan\_status, funded\_amnt, total\_rec\_prncp

### 12. ****Home Ownership Details****

Own, Mortgage, Rent, etc.

**Power BI Visuals:**  
🏠 Pie Chart for Ownership Type  
📊 Bar Chart for Default rate vs Ownership  
Filter with slicer

## 🧰 ****Power BI Topics/Features You’ll Use****

| **Feature** | **Purpose** |
| --- | --- |
| **Slicers** | For filtering by state, grade, term, year/month, etc. |
| **Cards** | Quick stats like total applications, funded amount |
| **Pie/Donut Charts** | Visualize proportions – grade, ownership, status |
| **Stacked/Clustered Bar Charts** | Compare groups like Good/Bad loans across terms or grades |
| **Line Charts** | Trend analysis for funding, applications, interest |
| **Map Visuals** | Visualize data across US states |
| **Filters/Panes** | Page-level or visual-level filtering |
| **Drillthroughs** | Click a state to go into detailed page for that state |
| **Tooltips** | Hover info on charts showing DTI, interest, etc. |
| **Date Hierarchies** | For monthly/yearly analysis |

## ✅ ****Dashboard Pages You Can Create****

1. **Overview Dashboard**

Cards: Total Loan Applications, Funded Amount, Avg Interest

Pie: Good vs Bad Loans

Bar: Applications by Grade

**2 . Geographical Dashboard**

Map: Loan Applications/Funding by State

Bar: Funded Amount by State

**Time-Based Trends**

Line Chart: Applications/Funding over Months

Area Chart: Avg Interest Rate over Time

**Risk Dashboard**

Bar Chart: Loan Grade vs Default Rate

DTI vs Status Comparison

**Home Ownership Insight**

Pie Chart: Ownership Types

Bar Chart: Ownership vs Bad Loan Count

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Cryptocurrency Dashboard:-

## 🚀 Coins You're Focusing On

| **Coin Name** | **Symbol** | **Description** |
| --- | --- | --- |
| Bitcoin | BTC | The OG of crypto — digital gold 🪙 |
| Ethereum | ETH | Supports smart contracts & dApps ⚙️ |
| Binance Coin | BNB | Native coin of Binance exchange 🔄 |
| Stellar | XLM | Focused on fast, low-cost payments ✨ |
| Stellar (XBP) | XBP | Likely a typo or alias — maybe meant XLM (recheck source) |

## 📘 Explanation of Terms You Mentioned

| **Term** | **Meaning** |
| --- | --- |
| **Market Cap** | Total value of a coin = Price × Circulating Supply |
| **Volume** | Total number of coins traded in a time period |
| **High** | Highest price in the selected date range |
| **Low** | Lowest price in the selected date range |
| **Open** | First price of the day/week/month |
| **Close** | Last price of the day/week/month |
| **Average** | Mean of open, close, high, low, or prices during a range |
| **OI** | Open Interest: Total number of open futures contracts (for derivatives trading) |
| **DO** | Could mean Date Open or Data Open (need clarification) |
| **SO** | Possibly Spot Open (trading term) – clarify if it’s part of your dataset |

### Classic models:

### Key Business Questions You’re Answering

| **Metric / Analysis** | **Description** |
| --- | --- |
| **Total Revenue** | Sum of all sales |
| **Revenue by Product / Category** | Grouped revenue by product or product line |
| **Orders by Year** | Year-wise order tracking |
| **Revenue vs Sales** | Compare money earned vs quantity sold |
| **Stock Quality by Product Name** | Remaining stock quantity by item |
| **Inventory Value by Product Line** | Value of current inventory per category |

## 📊 Power BI Topics You’re Using

| **Power BI Topic** | **Used For** |
| --- | --- |
| **Data Modeling (Relationships)** | Joining products, orders, orderdetails, customers |
| **Calculated Columns** | Total Revenue = Quantity × Price |
| **DAX Measures** | Aggregates like total revenue, total quantity, avg price, etc. |
| **Date Table** | Enables year-wise trends and time intelligence |
| **Hierarchies (Year > Quarter > Month)** | Drill-down in charts |
| **Bar/Column Charts** | For revenue by category/product line |
| **Line Charts** | Revenue over years |
| **Pie/Donut Charts** | Revenue share by product line |
| **KPI Cards** | Show Total Revenue, Orders, Products in Stock |
| **Slicers** | Filter by year, product line, region |
| **Tables/Matrix** | Show detailed numbers with conditional formatting |
| **Tooltips** | Hover info like inventory value or stock status |
| **Bookmarks/Page Navigation** | Create multiple pages (Revenue View, Inventory View, Sales Trend) |

### 🔧 Example DAX Measures

DAX

CopyEdit

Total Revenue = SUMX('OrderDetails', 'OrderDetails'[QuantityOrdered] \* 'OrderDetails'[PriceEach])

Revenue by Product Line =

CALCULATE([Total Revenue], VALUES('Products'[ProductLine]))

Total Quantity Sold = SUM('OrderDetails'[QuantityOrdered])

Inventory Value = SUMX('Products', 'Products'[QuantityInStock] \* 'Products'[BuyPrice])

## 🔍 Example Dashboards You Can Create

### 📈 ****Revenue Dashboard****

Total Revenue (Card)

Line Chart: Revenue by Year

Bar Chart: Revenue by Product Line

Pie Chart: Revenue % by Product Line

Slicer: Year/Product Line

### 📦 ****Inventory Dashboard****

Total Stock Quantity (Card)

Inventory Value by Product Line (Bar Chart)

Table: Product Name | Stock Quantity | Buy Price | Inventory Value

Conditional Formatting: Highlight low-stock products

### 🛍️ ****Sales Dashboard****

Total Orders

Quantity Sold by Product

Revenue vs Quantity Line Chart

Top 5 Bestselling Products