Loan Default Analysis

Project Objective

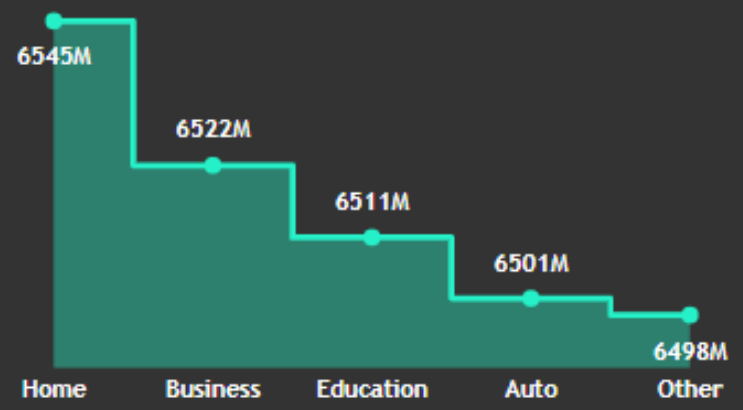
Hitch Credits is a financial firm aiming to leverage its underutilized loan and customer data to reduce default rates and drive business growth. This project focuses on uncovering key insights into customer behavior, loan performance, and risk factors to support data-driven decision-making.

Project Steps

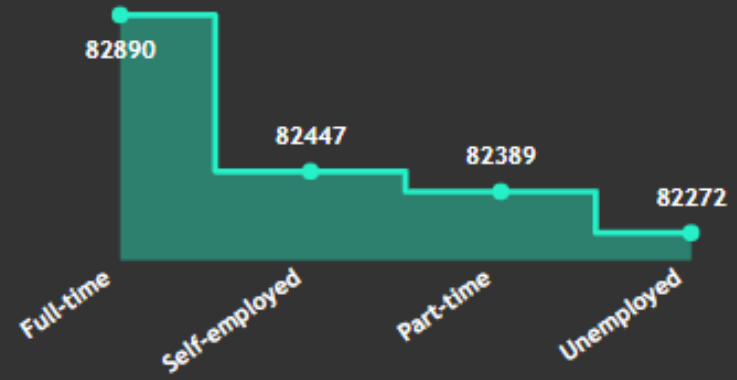
- Load the data into SQL server
- Create the Dataflow using Power BI services
- Importing into Power BI desktop from Dataflow
- Analyze, clean and create report
- Set up Schedule Refresh for Dataflow
- Publish the report to Power BI services
- Set up schedule Refresh for Report

Loan Default & Overview

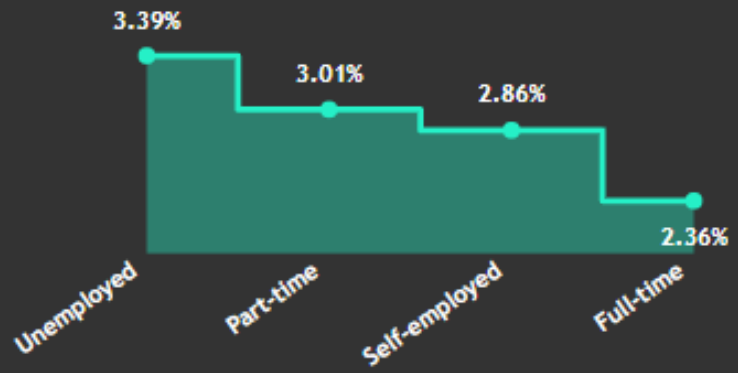
Loan Amount by Purpose



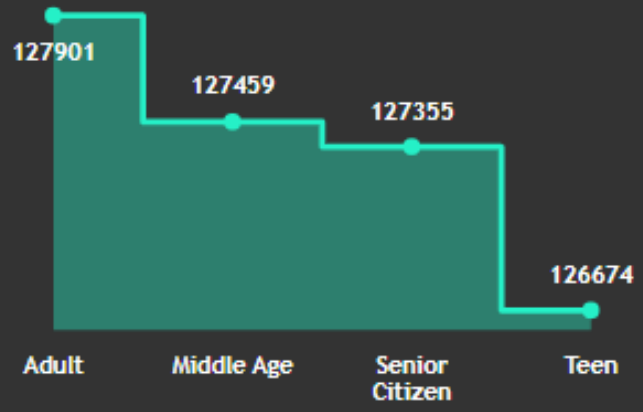
Income by Employment Type



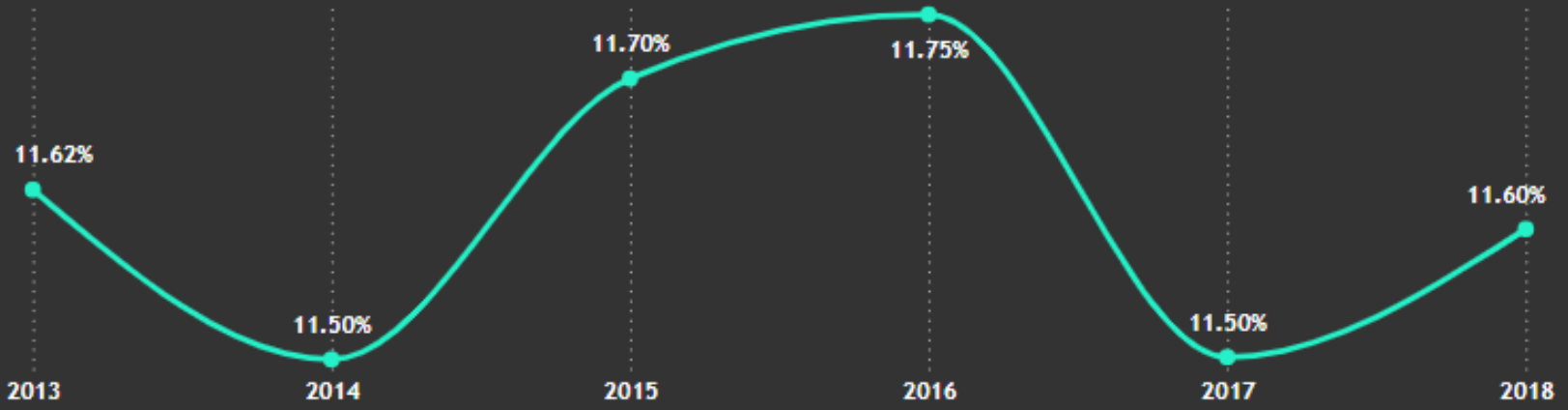
Default Rate by Employment Type



Average Loan Amount by Age Group

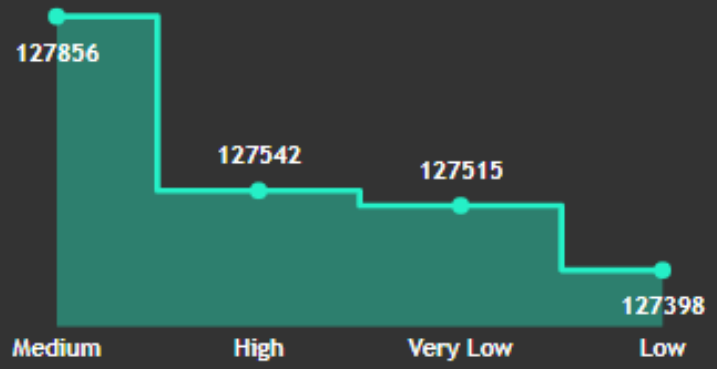


Default Rate by Year

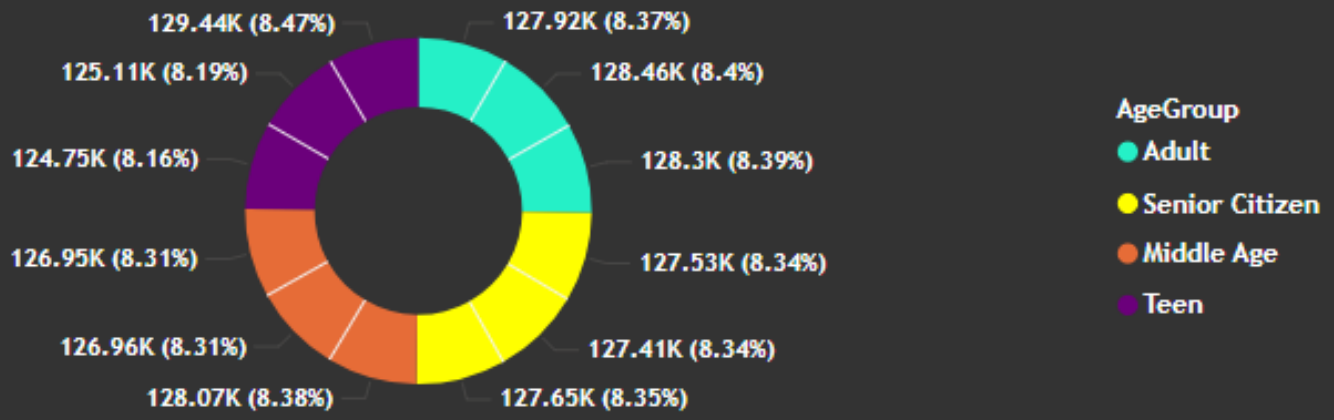


Applicant Demographic & Financial Profile

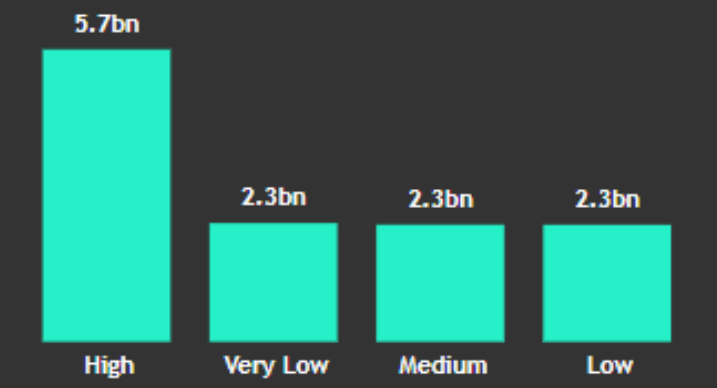
Median Loan Amount by Credit Score Category



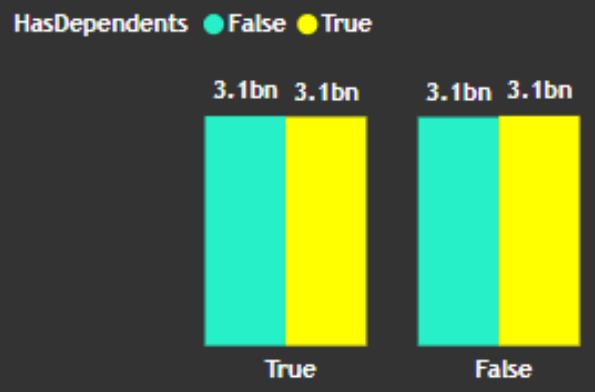
Average Loan Amount("High" Credit Score) by Age group & Marital Status



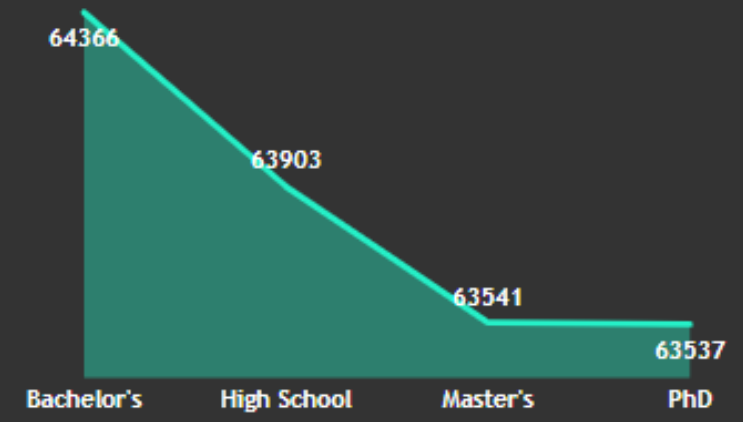
Loan Amount (Adult Age Group) by Credit Score Category



Loan Amount (Middle Age Group) by Mortgage and Dependents

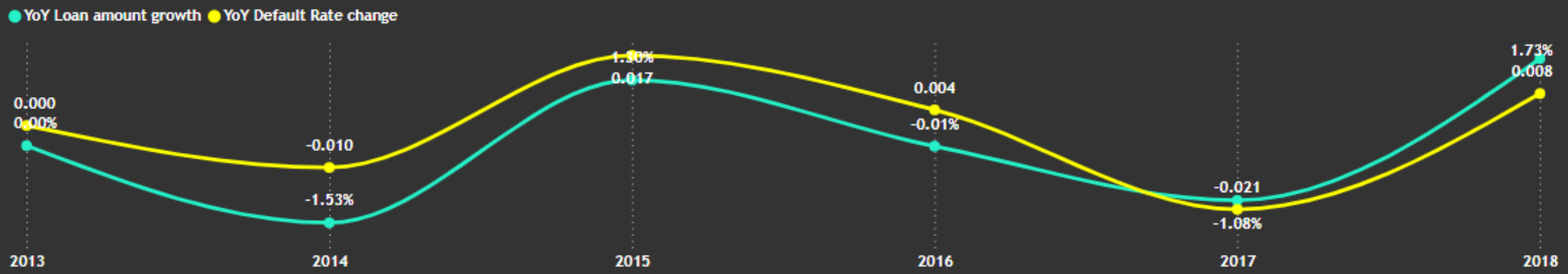


Loan Amount by Education Type

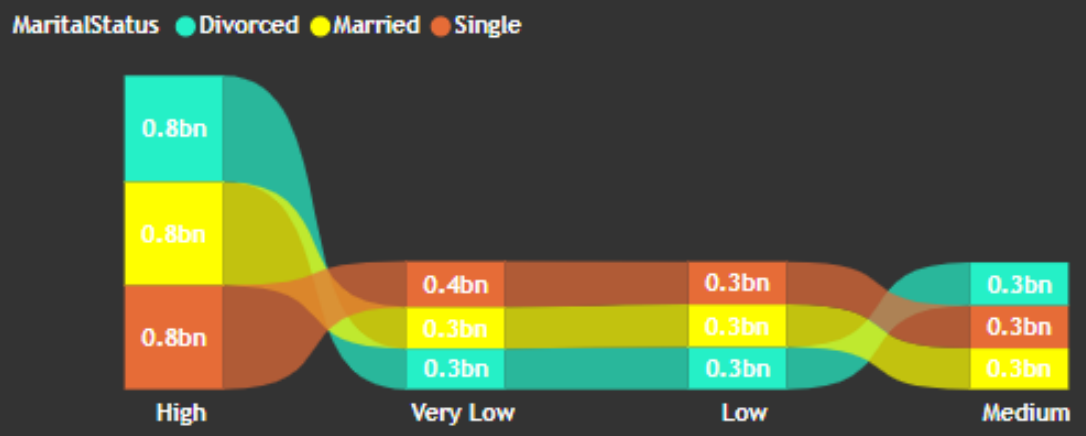


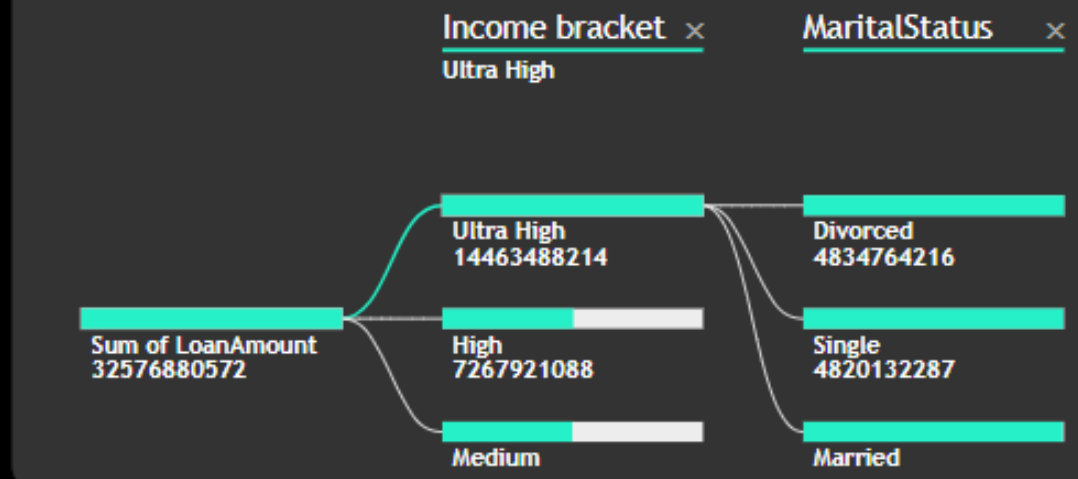
Financial Risk Metrics

YoY Loan Growth Rate



Loan Amount by Education Type & Marital Status





Measures used

```
Average Income by Employee Type = CALCULATE(
                                    AVERAGE(Loan_default[Income]),
                                    ALLEXCEPT(Loan_default, Loan_default
                                    [EmploymentType])
)
```

```
Average Loan Amount by Age Group = AVERAGEX(
                                     VALUES(Loan_default[AgeGroup]),
                                     AVERAGE(Loan_default[LoanAmount])
)
```

Measures used

```
Default Rate by Employment Type = CALCULATE(
                                    DIVIDE(
                                    CALCULATE(COUNTROWS(Loan_default),
                                    FILTER(Loan_default, Loan_default[Default]=TRUE())),
                                    ALLEXCEPT(Loan_default, Loan_default
                                    [EmploymentType])),

                                    CALCULATE(COUNTROWS(Loan_default),
                                    ALL(Loan_default))),
                                    ALLEXCEPT(Loan_default, Loan_default
                                    [EmploymentType])
)
```

Measures used

```
Default Rate by Year = DIVIDE(
                        CALCULATE(COUNTROWS(Loan_default),
                        FILTER(Loan_default, Loan_default[Default]=TRUE()),
                        ALLEXCEPT(Loan_default, Loan_default[Year])),

                        CALCULATE(COUNTROWS(Loan_default),
                        ALLEXCEPT(Loan_default, Loan_default[Year]))
)
```

```
Total Loan Amount = SUM(Loan_default[LoanAmount])
```

Measures used

```
Average Loan Amount for High Credit Score = CALCULATE(
                                        AVERAGE(Loan_default[LoanAmount]),
                                        FILTER(Loan_default, Loan_default
                                        [CreditScoreCategory] = "High"))
```

```
Loan Amount by Education = CALCULATE(
                                    COUNTROWS(Loan_default),
                                    ALLEXCEPT(Loan_default, Loan_default[Education]))
```

```
Median Loan Amount by Credit Score Category = MEDIANX(
                                        VALUES(Loan_default[CreditScoreCategory]),
                                        MEDIAN(Loan_default[LoanAmount])
)
```

Measures used

```
Total Loan Adult = SUMX(
                    FILTER(Loan_default, Loan_default[AgeGroup] = "Adult"),
                    Loan_default[LoanAmount]
)
```

```
Total Loan for Middle Age = SUMX(
                            FILTER(Loan_default, Loan_default[AgeGroup] = "Middle
                            Age"),
                            Loan_default[LoanAmount]
)
```

```
YTD loan amount = CALCULATE(
                    SUM(Loan_default[LoanAmount]),
                    DATESYTD(Loan_default[Loan_Date_DD_MM_YYYY]),
                    ALLEXCEPT(Loan_default, Loan_default[CreditScoreCategory],
                    Loan_default[MaritalStatus])
)
```

Measures used

```
YoY Loan amount growth =
    VAR current_year_loan = CALCULATE(
                            SUM(Loan_default[LoanAmount]),
                            Loan_default[Year] = MAX(Loan_default[Year])
                            )

    VAR previous_year_loan = CALCULATE(
                            SUM(Loan_default[LoanAmount]),
                            Loan_default[Year] = MAX(Loan_default[Year])-1
                            )
    RETURN
        DIVIDE(
            CALCULATE(current_year_loan - previous_year_loan), previous_year_loan, 0
            )
```

Measures used

```
YoY Default Rate change =
    VAR default_count_current_year = CALCULATE(COUNTROWS(Loan_default), Loan_default
    [year] = MAX(Loan_default[Year]), Loan_default[Default]=TRUE())
    VAR total_loan_count_current_year = CALCULATE(COUNTROWS(Loan_default), Loan_default
    [Year] = MAX(Loan_default[Year]))
    VAR default_count_previous_year = CALCULATE(COUNTROWS(Loan_default), Loan_default
    [Year] = MAX(Loan_default[Year]) -1, Loan_default[Default] = TRUE())
    VAR total_loan_count_previous_year = CALCULATE(COUNTROWS(Loan_default),
    Loan_default[Year] = MAX(Loan_default[Year])-1)
    VAR default_rate_current_year = DIVIDE(default_count_current_year,
    total_loan_count_current_year, 0)
    VAR default_rate_previous_year = DIVIDE(default_count_previous_year,
    total_loan_count_previous_year, 0)
    RETURN
        DIVIDE(CALCULATE(default_rate_current_year - default_rate_previous_year),
        default_rate_previous_year, 0
        )
```

Report Insights

Loan Default & Overview

- Unemployed individuals show the highest default rate (3.39%), while full-time employed show the lowest (2.36%).
- Default rate peaked in 2016 (11.75%) and dipped in 2014 & 2017 (11.50%), indicating cyclic risk.
- Home and Business loans are the most common (~$6545M & ~$6522M respectively).
- Full-time employees earn the highest average income (~$82.8K), indicating better repayment capacity.

Applicant Demographics & Behavior

- Medium credit score category applicants consistently receive larger loans.
- Bachelor’s degree holders take the highest average loans (~$64.3K).
- In the adult age group, high credit score applicants gets the highest loan amount

Financial Risk & Growth Metrics

- 2018 saw the highest YoY loan growth (1.73%) with a marginal increase in default rate.
- 'Ultra High' income group contributes significantly (~$1.44T), mainly among single/divorced customers

Business Recommendations

1. Strengthen screening for unemployed/part-time applicants to reduce defaults.
2. Promote lending to full-time employed and high credit score individuals.
3. Personalize offerings for adults with strong income and education backgrounds.
4. Monitor default trends across years for proactive risk management.
5. Use demographics (age, credit score, marital status) to segment offers.