LOAN APPROVEL ANALYSIS

Python(pandas) , SQL , Power bi

PRESENTED BY PRINCE KUMAR YADAV

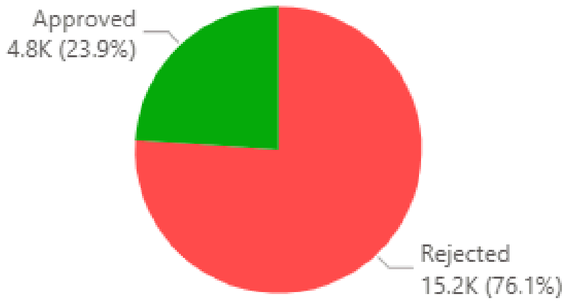
Loan Analysis Dashboard

MaritalStatus
- [ ] Divorced
- [ ] Married

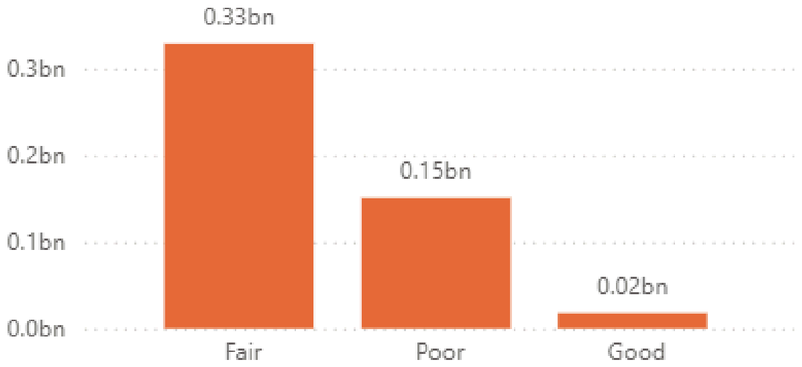
LoanPurpose
- [ ] Auto
- [ ] Debt Consolidation

Total_Application	Approved_Application	Approval_Rate	Average_Loan_Amount	Total_loan
20K	4780	23.9%	24.9K	498M

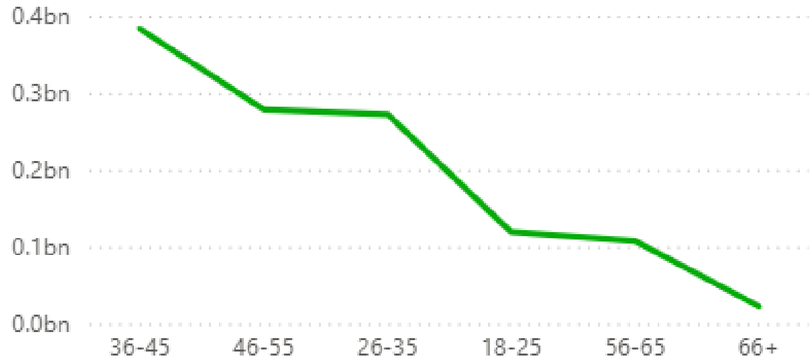
loan_Approval_Status



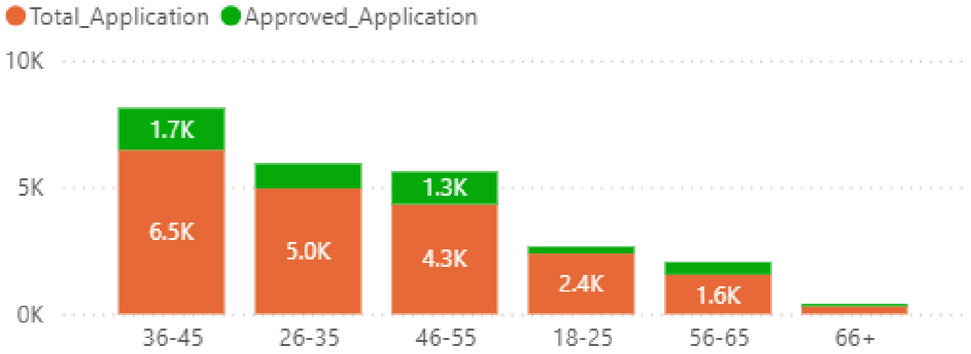
LoanAmount by CreditScoreCategor



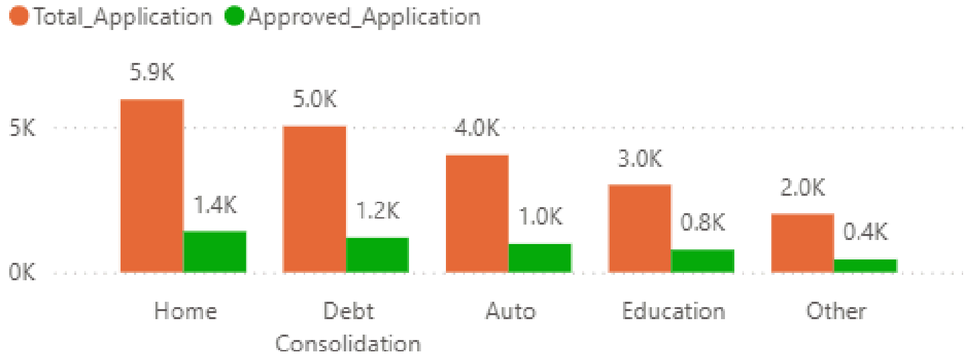
AnnualIncome by AgeGroup



Total and Approved Application by AgeGroup



Loan Purpose Analysis



HomeOwnershipStat...
- [ ] Mortgage
- [ ] Other
- [ ] Own
- [ ] Rent

```python
import pandas as pd

loan = pd.read_csv('Loan_data.csv')

# print(loan.describe())
# print(loan.shape)

# Convert ApplicationDate to datetime

loan['ApplicationDate'] = pd.to_datetime(loan['ApplicationDate'], format='%d-%m-%Y' , errors='coerce')


loan['Month'] = loan['ApplicationDate'].dt.month
loan['Year'] = loan['ApplicationDate'].dt.year


# Create Age Groups

bins = [18 , 25, 35, 45 ,55, 65  , 100]
labels = ['18-25', '26-35', '36-45' , '46-55' , '56-65', '66+']

loan['AgeGroup']= pd.cut(loan['Age'] , bins=bins , labels=labels , include_lowest=True)

```

```python
# Create Credit Score Category (based on Indian banking standards)

def Credit_Score_Categor(Score):
    if Score < 550:
        return 'Poor'
    elif Score < 650 :
        return 'Fair'
    elif Score < 750 :
        return 'Good'
    elif Score < 850 :
        return 'Very Good'
    else :
        return 'Excellent'

loan['CreditScoreCategor'] = loan['CreditScore'].apply(Credit_Score_Categor)


# Calculate Debt-to-Income Ratio Percentage

loan['DebttoIncomePercent'] = (loan['MonthlyDebtPayments']/loan['MonthlyIncome'])*100


# Create DTI Risk Category

def dti_risk_category(dti):
    if dti < 20 :
        return 'Low Risk'
    elif dti <= 40:
        return 'Medium Risk'
    else :
        return 'High Risk'

loan['DTIRiskCategory'] = loan['DebttoIncomePercent'].apply(dti_risk_category)

```

```
60
61  # Simplify LoanApproved column to human-readable status
62
63  loan['LoanApprovedStatus'] = loan['LoanApproved'].map({1: 'Approved', 0: 'Rejected'})
64
65  print(loan.head(20))
66
67  # Save Cleaned Dataset
68
69  loan.to_csv('Cleaned_loan_data.csv', index=False)
70
71  print('Saved')
72
```

```sql
create database loan_analysis;
use loan_analysis;

select * from loan_data limit 10;

-- Total Loans Approved vs Rejected --

SELECT
    loanapprovedstatus, COUNT(*) AS totalaplication
FROM
    loan_data
GROUP BY 1;
```

Result Grid | Filter Rows: | Export: | Wrap Cell Content:

loanapprovedstatus	totalaplication
Rejected	15220
Approved	4780

```sql
-- Approval Rate --

SELECT
    ROUND(SUM(CASE
                WHEN loanapprovedstatus = 'Approved' THEN 1
                ELSE 0
            END) * 100 / COUNT(*),
            2) AS loan_Approval_Rate
FROM
    loan_data;

```

Result Grid | Filter Rows: | Export: | Wrap Cell Content:

loan_Approval_Rate
23.90

```sql
        -- Approval Rate by AgeGroup --
SELECT
    AgeGroup,
    COUNT(*) AS total_application,
    SUM(CASE
        WHEN loanapprovedstatus = 'approved' THEN 1
        ELSE 0
    END) AS Approved_loan,
    ROUND(SUM(CASE
                WHEN loanapprovedstatus = 'approved' THEN 1
                ELSE 0
            END) * 100 / COUNT(*),
            2) AS Approved_loan_rate
FROM
    loan_data
GROUP BY 1
ORDER BY approved_loan DESC;

```

Result Grid | Filter Rows: | Export: | Wrap Cell Content:

AgeGroup	total_application	Approved_loan	Approved_loan_rate
36-45	6470	1653	25.55
46-55	4318	1304	30.20
26-35	4962	968	19.51
56-65	1565	480	30.67
18-25	2382	277	11.63

```sql
-- Approval Rate by Credit Score Category --

SELECT
    creditscorecategor,
    COUNT(*) AS total_application,
    ROUND(SUM(CASE
                WHEN loanapprovedstatus = 'approved' THEN 1
                ELSE 0
            END) * 100 / COUNT(*),
            2) AS approvel_rate
FROM
    loan_data
GROUP BY 1
ORDER BY 2 DESC;
```

Result Grid | Filter Rows: | Export: | Wrap Cell Content:

creditscorecategor	total_application	approvel_rate
Fair	13259	25.47
Poor	6020	17.97
Good	721	44.52

```sql
-- Approval Rate by DTI Risk Category --

SELECT
    dtiriskcategory,
    COUNT(*) AS total_application,
    ROUND(SUM(CASE
                WHEN loanapprovedstatus = 'approved' THEN 1
                ELSE 0
            END) * 100 / COUNT(*),
            2) AS approvel_rate
FROM
    loan_data
GROUP BY 1;
```

Result Grid | Filter Rows: | Export: | Wrap Cell Content:

dtiriskcategory	total_application	approvel_rate
Low Risk	16256	29.10
Medium Risk	3030	1.62
High Risk	714	0.14

```sql
SELECT
    CASE
        WHEN monthlyincome < 20000 THEN '<20k'
        WHEN monthlyincome BETWEEN 20000 AND 40000 THEN '20k-40k'
        WHEN monthlyincome BETWEEN 40000 AND 60000 THEN '40k-60k'
        ELSE '>60k'
    END AS Income_group,
    COUNT(*) AS total_application,
    SUM(CASE
        WHEN loanapprovedstatus = 'approved' THEN 1
        ELSE 0
    END) AS approved_application,
    ROUND(AVG(loanamount), 2) AS avg_loan_amount,
    ROUND(SUM(CASE
                WHEN loanapprovedstatus = 'approved' THEN 1
                ELSE 0
            END) * 100 / COUNT(*),
            2) AS loan_approvel_rate
FROM
    loan_data
GROUP BY 1;
```

Result Grid | Filter Rows: | Export: | Wrap Cell Content:

Income_group	total_application	approved_application	avg_loan_amount	loan_approvel_rate
<20k	19896	4676	24886.16	23.50
20k-40k	104	104	24253.41	100.00

Thank you very much!