



केन्द्रीय प्रौद्योगिकी संस्थान कोकराझार
CENTRAL INSTITUTE OF TECHNOLOGY KOKRAJHAR
DEEMED TO BE UNIVERSITY UNDER MOE, GOVT. OF INDIA

Machine Learning Project

Car Loan Eligibility Prediction

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Introduction

In today's world, buying a vehicle often involves securing a loan to complete the purchase. The loan approval process can be complex and daunting, often leaving applicants uncertain about their eligibility. Our machine learning model “Car Loan Eligibility Prediction” predicts the likelihood of an individual's eligibility for a car loan.

PROBLEM STATEMENT

- Time-Consuming Manual Process
- Inefficiencies and Delays
- Lack of Real-Time Responses
- Slower and Less Accurate Decisions

SOLUTION

- Implement Automated Loan Eligibility Assessment
- Utilize Predictive Modeling
- Real-Time Decision Making
- Continuous Monitoring and Model Updating

Methodolgy



Machine learning



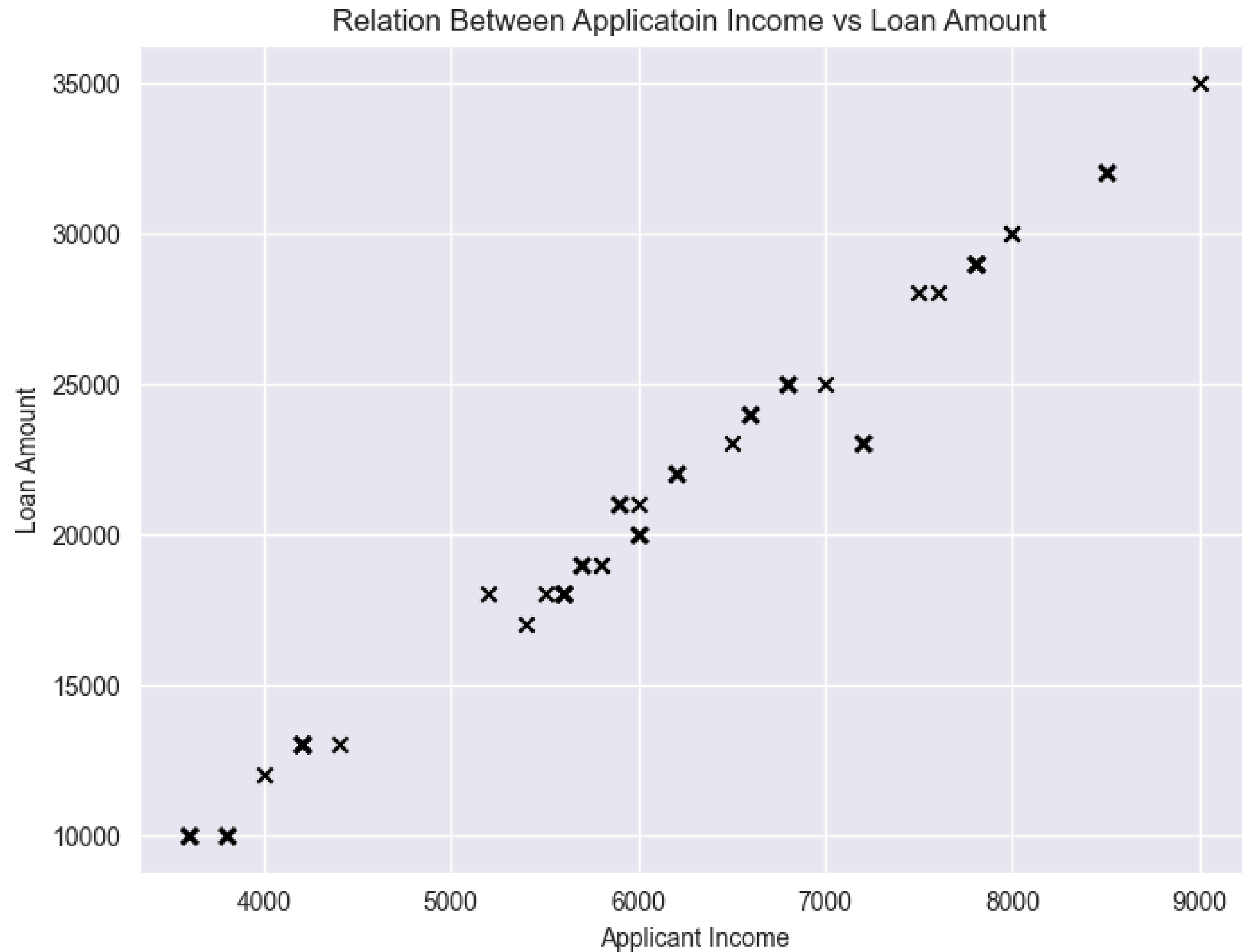
K-Nearest Neighbors

Data

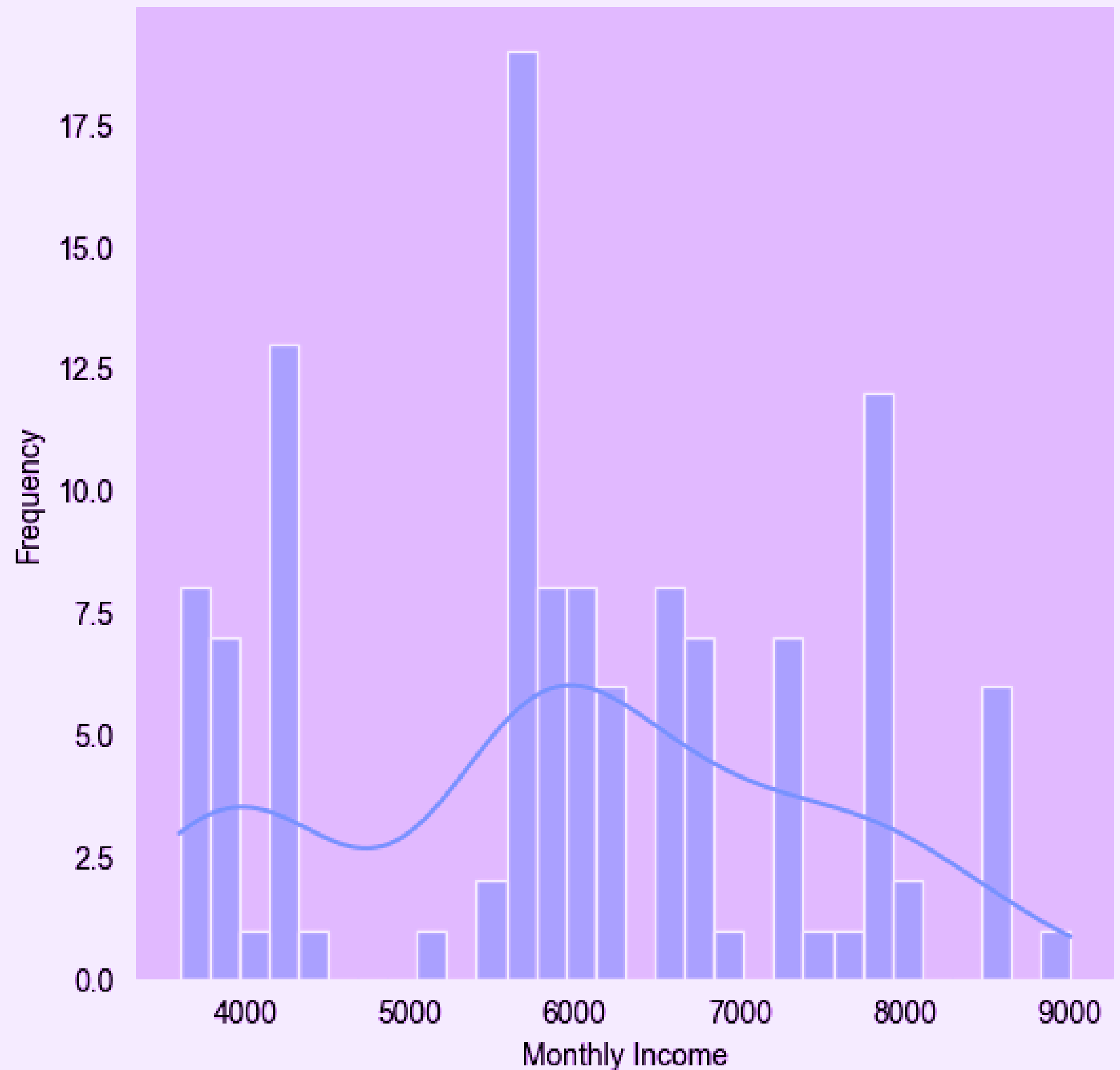
- Age
- Gender
- Marital_Status
- Dependents
- Monthly_Income
- Employment_Status
- Employment_Duration
- Total_Monthly_Debt_Obligations
- Credit_Score
- Credit_History_Length
- Down_Payment_Amount
- Interest_Rate
- Installment_Amount
- Housing_Status
- Education_Level
- Previous_Loan_Status
- Previous_Loan_Amount
- Previous_Loan_Term
- Previous_Loan_Purpose
- Loan_Eligibility

Comprehensive Financial and Personal Data Report - Q3 2023																							
Personal Information												Financial Data											
Demographics				Family & Dependents				Income & Expenses				Debt & Loans				Assets & Liabilities				History & Status			
Applicant	Age	Gender	Marital_Status	Dependents	Monthly_Income	Employment_Status	Employment_Length	Total_Monthly_Income	Credit_Score	Credit_History	Debt_to_Income	Loan_Amount	Loan_Term	Down_Payment	Interest_Rate	Installment	Housing_Status	Education_Level	Previous_Loan_Status	Previous_Loan_Amt	Previous_Loan_Term	Previous_Loan_Purpose	Loan_Eligibility
1	35	Male	Married	2	6000	Employed	5	1500	700	3	0.25	20000	60	4000	0.08	420	Own	Bachelor's	Not Applicable	0	0	Not Applicable	Eligible
2	28	Female	Single	0	4000	Employed	3	800	650	2	0.2	12000	48	2000	0.07	260	Rent	Bachelor's	Not Applicable	0	0	Not Applicable	Eligible
3	45	Male	Married	3	8000	Self-Employed	8	2000	720	5	0.3	30000	72	6000	0.09	550	Own	Master's	Previous Loan Closed	25000	60	Car Purchase	Not Eligible
4	33	Female	Married	1	5500	Employed	6	1200	680	4	0.24	18000	60	3000	0.08	380	Own	Bachelor's	Not Applicable	0	0	Not Applicable	Eligible
5	40	Male	Divorced	0	7000	Employed	10	1500	720	7	0.35	25000	60	4000	0.08	420	Own	High School	Not Applicable	0	0	Not Applicable	Eligible
6	27	Female	Single	0	3800	Employed	2	600	630	2	0.18	10000	36	1500	0.06	210	Rent	Associate's	Not Applicable	0	0	Not Applicable	Eligible
7	48	Male	Married	4	9000	Employed	12	1800	750	9	0.4	35000	72	7000	0.1	590	Own	Doctorate	Not Applicable	0	0	Not Applicable	Eligible
8	31	Female	Married	2	6200	Employed	7	1400	700	5	0.32	22000	60	4500	0.09	460	Own	Master's	Not Applicable	0	0	Not Applicable	Eligible
9	36	Male	Single	1	5800	Employed	4	1300	690	4	0.26	19000	60	3500	0.08	400	Rent	Bachelor's	Not Applicable	0	0	Not Applicable	Eligible
10	29	Female	Single	0	4200	Employed	3	700	660	3	0.22	13000	48	2500	0.07	290	Rent	High School	Not Applicable	0	0	Not Applicable	Eligible
11	42	Male	Married	2	7500	Self-Employed	9	1600	730	6	0.28	28000	72	5000	0.09	520	Own	Master's	Previous Loan Closed	20000	48	Home Improvement	Not Eligible
12	30	Female	Married	1	5400	Employed	5	1100	670	4	0.25	17000	60	2800	0.08	360	Own	Associate's	Not Applicable	0	0	Not Applicable	Eligible
13	38	Male	Single	0	6500	Employed	8	1500	710	5	0.29	23000	60	4000	0.08	420	Rent	Bachelor's	Not Applicable	0	0	Not Applicable	Eligible
14	26	Female	Single	0	3800	Employed	2	600	630	2	0.18	10000	36	1500	0.06	210	Rent	Associate's	Not Applicable	0	0	Not Applicable	Eligible
15	47	Male	Married	3	8500	Employed	11	1700	740	8	0.38	32000	72	6000	0.1	560	Own	Doctorate	Not Applicable	0	0	Not Applicable	Eligible
16	32	Female	Married	2	6000	Employed	6	1300	690	5	0.29	20000	60	3500	0.08	400	Own	Bachelor's	Not Applicable	0	0	Not Applicable	Eligible
17	39	Male	Single	1	5900	Employed	4	1400	700	4	0.27	21000	60	4000	0.08	420	Rent	Bachelor's	Not Applicable	0	0	Not Applicable	Eligible
18	28	Female	Single	0	4200	Employed	3	700	660	3	0.22	13000	48	2500	0.07	290	Rent	High School	Not Applicable	0	0	Not Applicable	Eligible
19	44	Male	Married	2	7800	Self-Employed	10	1600	730	6	0.29	29000	72	5000	0.09	520	Own	Master's	Previous Loan Closed	22000	48	Home Improvement	Not Eligible
20	31	Female	Married	1	5600	Employed	5	1200	670	4	0.26	18000	60	3000	0.08	380	Own	Associate's	Not Applicable	0	0	Not Applicable	Eligible
21	37	Male	Single	0	6600	Employed	8	1500	710	5	0.29	24000	60	4000	0.08	420	Rent	Bachelor's	Not Applicable	0	0	Not Applicable	Eligible
22	25	Female	Single	0	3600	Employed	2	600	630	2	0.18	10000	36	1500	0.06	210	Rent	Associate's	Not Applicable	0	0	Not Applicable	Eligible
23	46	Male	Married	3	7200	Employed	7	1400	710	6	0.31	23000	60	3500	0.08	400	Own	Bachelor's	Not Applicable	0	0	Not Applicable	Eligible
24	34	Female	Married	1	5700	Employed	4	1200	680	5	0.27	19000	60	3000	0.08	380	Own	Associate's	Not Applicable	0	0	Not Applicable	Eligible
25	41	Male	Single	0	6800	Employed	9	1600	720	6	0.29	25000	60	4500	0.09	460	Rent	Bachelor's	Not Applicable	0	0	Not Applicable	Eligible
26	29	Female	Single	0	4400	Employed	3	800	660	3	0.2	13000	48	2500	0.07	290	Rent	High School	Not Applicable	0	0	Not Applicable	Eligible
27	43	Male	Married	2	7600	Self-Employed	10	1700	730	7	0.3	28000	72	5000	0.09	520	Own	Master's	Previous Loan Closed	21000	48	Home Improvement	Not Eligible

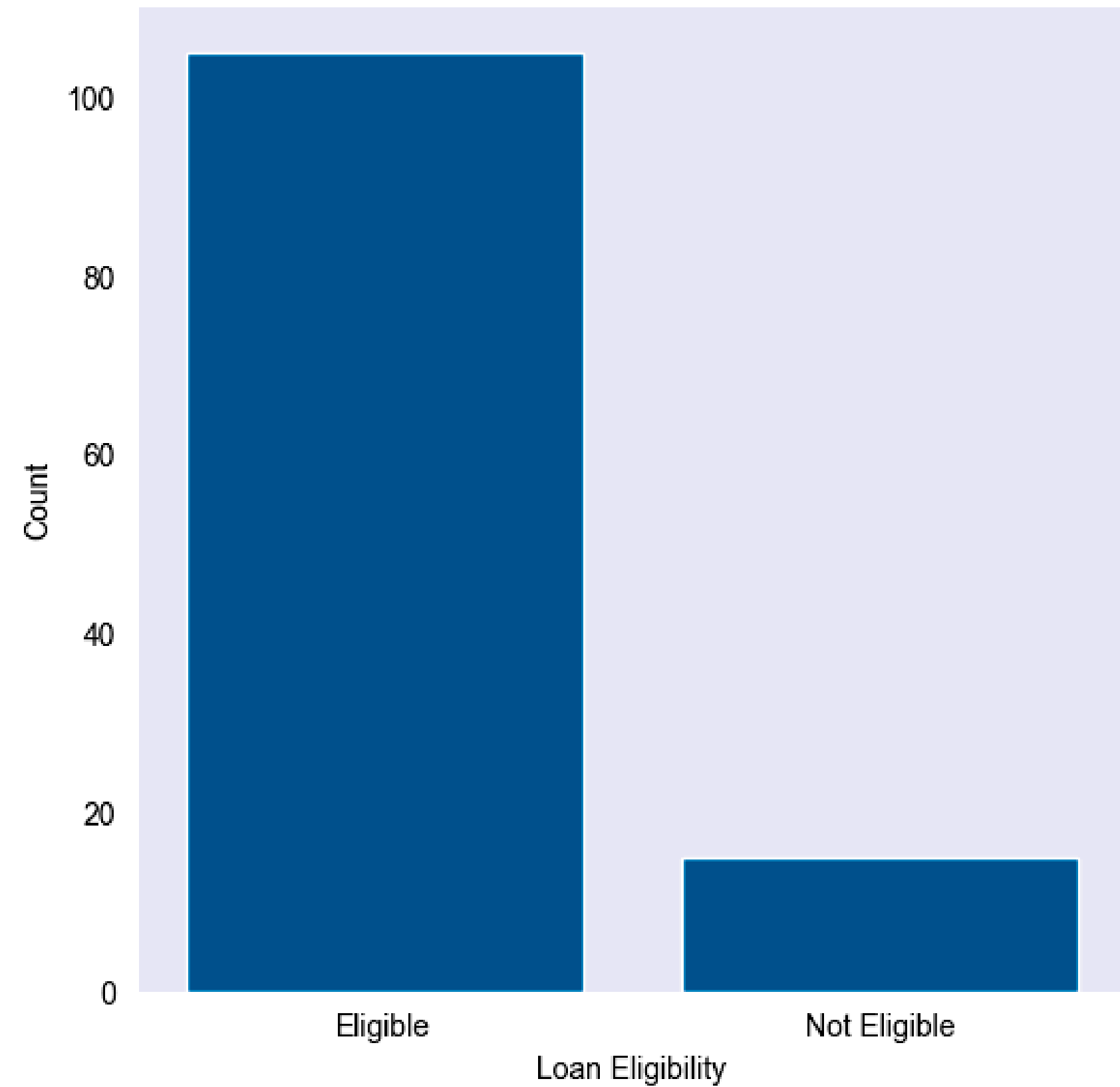
Data Visualisation



Distribution of Monthly Income



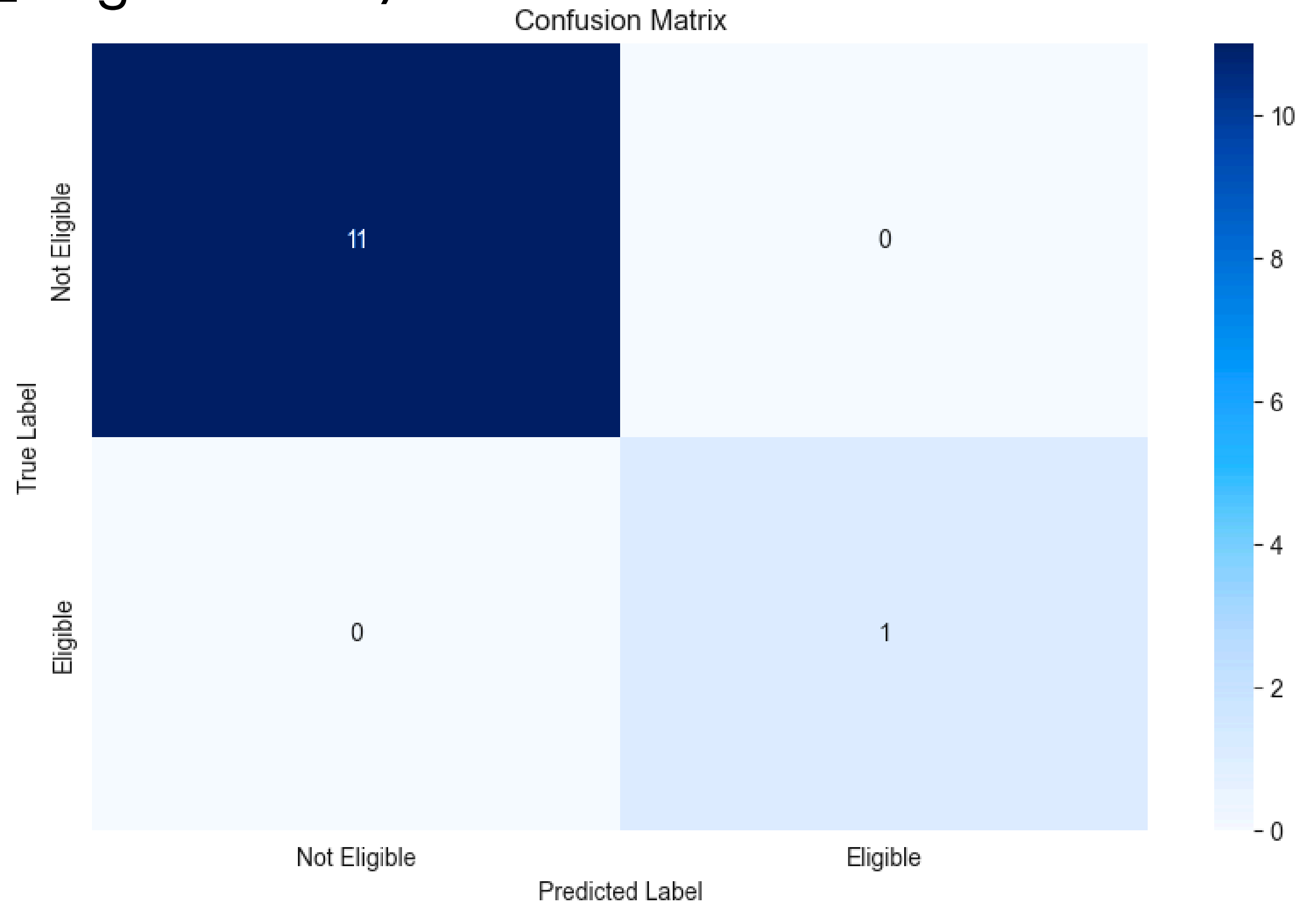
Loan Eligibility Counts



Model Outcome

KNeighborsClassifier(n_neighbors = 5)

accuracy_score : 1



Conclusion

- The loan eligibility prediction model has significant implications for optimizing loan approval processes and reducing manual efforts.
- Key factors influencing loan eligibility are income, credit score, and employment status.
- Future steps include exploring advanced algorithms and real time data for enhanced model performance.

Reference

1. C. Naveen Kumar, D. Keerthana, M. Kavitha and M. Kalyani, "Customer Loan Eligibility Prediction using Machine Learning Algorithms in Banking Sector," 2022 7th International Conference on Communication and Electronics Systems (ICCES), Coimbatore, India, 2022, pp. 1007-1012, doi: 10.1109/ICCES54183.2022.9835725.
2. Miraz Al Mamu and Afia Farjana and Muntasir Mamun,"Predicting Bank Loan Eligibility Using Machine Learning Models and Comparison Analysis" Proceedings of the 7th North American International Conference on Industrial Engineering and Operations Management, Orlando, Florida, USA, June 12-14, 2022
3. Swapnesh, Debasish & Nayak, Debasish & Swarnkar, Tripti. (2023). LOAN ELIGIBILITY PREDICTION USING MACHINE LEARNING: A COMPARATIVE APPROACH. 3. 48-54.

Thank You !