**Unveiling the Future: Household Mortgages with Predictive Analysis**

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# **Overview**

Loans are important for people who need money for things like education, buying a home, or other things they want. For financial institutions, lending plays a pivotal role, serving as a significant source of profitability. However, the conventional loan evaluation process is often intricate and time-consuming, requiring meticulous consideration of numerous factors. To address these time-consuming processes and improve the efficiency of home loan assessments, our project uses Machine Learning to simplify and streamline the home loan lending process, enabling real-time decisions through data-driven insights and predictive analytics.

Our core objective is to build a robust model capable of accurately predicting the eligibility of loan applicants for our financial institution clients to improve efficiency of home loan approval systems. By utilizing historical loan data containing vital features such as Marital Status, Education, Applicant Income, and Credit History, the model will be trained to classify new applicants into two categories: those eligible or not eligible for a loan. Our research revolves around enhancing the loan application process, with a specific emphasis on shaping the future of the instant loan appraisal economy through data-driven insights. We strive to empower both loan facilitators and users to make informed real-time decisions and improve financial planning for property acquisitions. This approach aims to elevate the efficiency as well as the overall accuracy of loan evaluations, leading to better client experiences and enhanced risk management for financial institutions.

# **Goals/Objectives**

Our analysis aims to address key challenges in loan appraisal processes:

# Develop predictive models to evaluate the eligibility of loan applicants based on their profiles, using historical loan data and key features such as Applicant Income, Co-applicant Income, Loan Amount, Loan Amount Term, Credit History.

# Develop an inclusive loan eligibility model that considers demographics such as Gender, Dependents, Marital Status and Education. The goal is to ensure that individuals from diverse backgrounds have fair access to loans, thereby fostering financial inclusion and reducing potential biases within the system.

# Employ machine learning algorithms to identify and analyse patterns related to different property area types. This aims to enhance understanding and insights into how the property's location impacts loan eligibility.

# Optimise the model using different mode and layer combinations as well as different training and testing models to improve the accuracy.

# **Datasource/Dataset**

* <https://www.geeksforgeeks.org/loan-approval-prediction-using-machine-learning/>
* <https://drive.google.com/file/d/1LIvIdqdHDFEGnfzIgEh4L6GFirzsE3US/view>
* The dataset consists of 598 home loan approval records with the following features:

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| --- | --- |
| 1. Loan ID 2. Gender 3. Marital Status 4. Dependents 5. Education (Graduate or Not) 6. Self Employed 7. Applicant Income | 1. Co-applicant Income 2. Loan Amount (in thousands) 3. Loan Amount Term (in months). 4. Credit History 5. Property Area (Rural, Urban, or Semi-urban). 6. Loan Status (Y-Yes or N-No) |

# **Github**

https://github.com/Akif23Hasan/Project\_4\_Group-1\_MortgageAppraisalPredictivePowers