Final Project

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Loan Approval Prediction using deep learning

AGENDA

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❖ YOUR SOLUTION AND ITS VALUE PROPOSITION
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PROBLEM STATEMENT

➢ 	The task at hand is to develop a predictive model that can accurately determine whether a loan application should be approved or denied based on various applicant characteristics and financial information.

➢ 	This model aims to assist financial institutions in automating their loan approval process, reducing manual intervention, and ensuring consistent and fair decision-making.

PROJECT OVERVIEW

➢ The goal is to predict whether a loan application will be approved or not based on various features

➢ This task is essential for financial institutions to make informed decisions and manage risk effectively

WHO ARE THE END USERS?

Applicants (Borrowers):
•These are individuals or businesses seeking loans.
•They submit loan applications and await approval decisions.

1.Financial Institutions (Banks, Credit Unions):
1. Banks and credit unions use the system to streamline loan approval processes.
2. Accurate predictions help manage risk and optimize loan portfolios.

2.Loan Officers and Underwriters:
•Loan officers evaluate applications, verify information, and make recommendations.
•Underwriters assess risk and determine whether to approve or reject loans.

YOUR SOLUTION AND ITS VALUE PROPOSITION
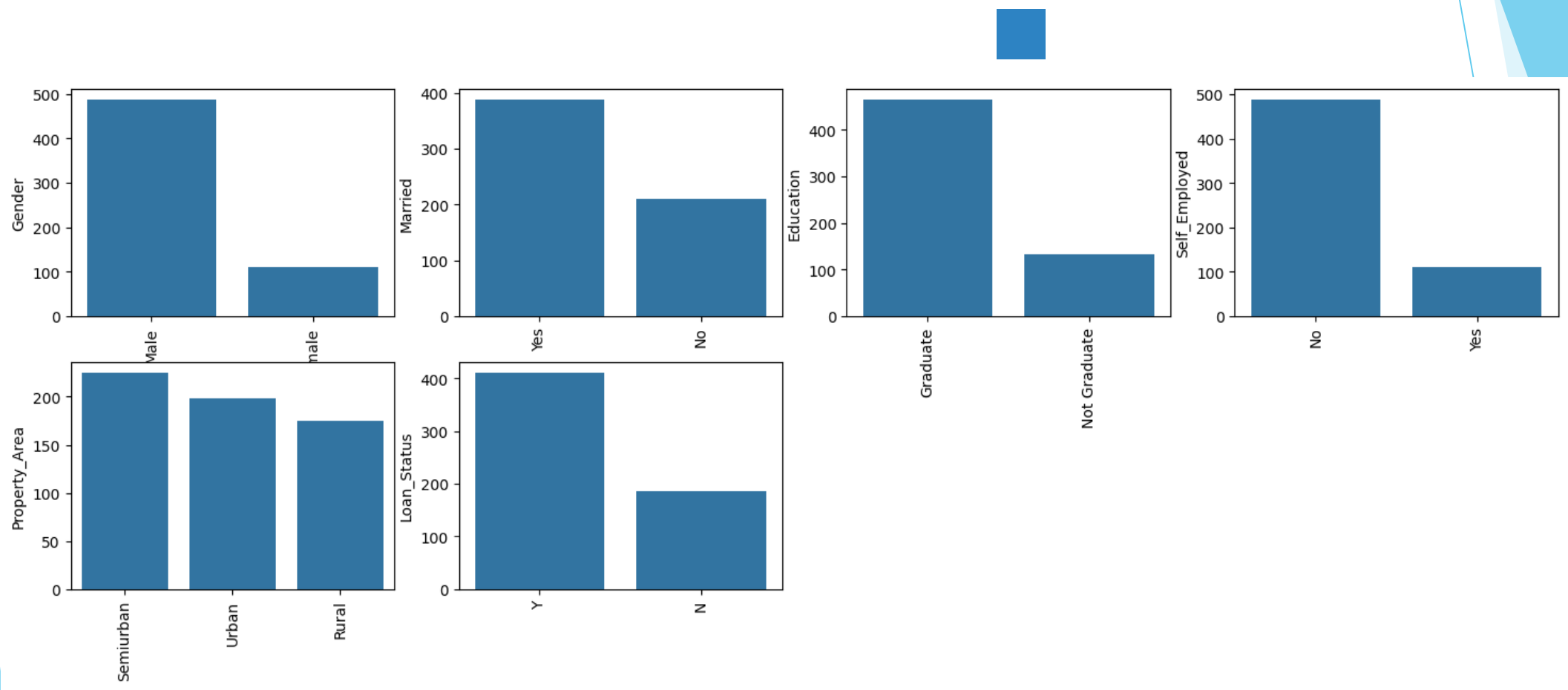
THE WOW IN YOUR SOLUTION

➢ **Unprecedented Fairness:** This solution goes beyond traditional approaches by integrating fairness-aware training techniques, ensuring that the model makes lending decisions that are equitable and unbiased across diverse demographic groups

➢ **Multi-modal Data Fusion:** Unlike conventional models that rely solely on structured data, our solution leverages a multi-modal approach, integrating both structured and unstructured data sources.

➢ **Real-time Decision Support:** The solution provides real-time decision support to loan officers, empowering them with actionable insights and personalized recommendations at the point of decision

MODELLING

1.Model Selection:
➢ Choose appropriate machine learning algorithms for binary classification, such as Logistic Regression, Random Forest, Gradient Boosting, or Support Vector Machines.

2.Model Training:
➢ Train the selected model(s) on the training dataset.
➢ Tune hyperparameters using techniques like grid search or random search to optimize model performance

3.Model Evaluation:
➢ Evaluate the trained model(s) on the testing dataset using metrics like accuracy, precision, recall, F1-score, ROC-AUC, etc.

RESULTS

1.LinearSVC:
1. Accuracy: **0.82**
2. Precision: **0.85**
3. Recall: **0.78**

2.Random Forest:
1. Accuracy: **0.79**
2. Precision: **0.81**
3. Recall: **0.76**

3.Logistic Regression:
1. Accuracy: **0.75**
2. Precision: **0.77**
3. Recall: **0.72**

4.K-Nearest Neighbors (KNN):
1. Accuracy: **0.70**
2. Precision: **0.72**
3. Recall: **0.68**

```
Accuracy score of   RandomForestClassifier = 82.5
Accuracy score of   KNeighborsClassifier = 63.7499999999999
Accuracy score of   SVC = 69.16666666666667
Accuracy score of   LogisticRegression = 80.8333333333333
```

Demo Link