**Credit Scoring Model – Project Summary**

In this project, we developed a basic **Credit Scoring Model** to predict whether an individual is creditworthy based on features such as income, debt, payment history, and age.

**Steps Taken:**

1. **Data Simulation**: Created a synthetic dataset with realistic distributions.
2. **Feature Engineering**: Introduced a new feature – debt-to-income ratio.
3. **Preprocessing**: Scaled the features using StandardScaler.
4. **Model Training**: Trained three models — Logistic Regression, Decision Tree, and Random Forest.
5. **Evaluation**: Used classification metrics (Precision, Recall, F1-score) and **ROC-AUC** to assess performance.
6. **Visualization**: Plotted ROC curves to compare model performance visually.

**Model Performance Summary:**

| **Model** | **Accuracy** | **Class 1 Recall** | **ROC-AUC** | **Notes** |
| --- | --- | --- | --- | --- |
| **Logistic Regression** | **0.71** | **1.00** | 0.46 | Best for identifying creditworthy (Class 1), but fails for Class 0 |
| Decision Tree | 0.58 | 0.69 | **0.50** | Balanced recall for both classes, but lower accuracy |
| Random Forest | 0.64 | 0.83 | 0.49 | Moderate performance, weak on Class 0 |

**Conclusion:**

* **Logistic Regression** performed the best overall for detecting **creditworthy individuals** with high recall and F1-score.
* However, **all models struggled with detecting non-creditworthy individuals (Class 0)** due to class imbalance.
* For better real-world application, further improvements like **class balancing (e.g., SMOTE)** and **real credit data** would enhance model reliability.