✒️ ***Executive Summary***

📌 Executive Summary

This project analyzes bank loan, repayment, and customer credit data to evaluate **loan default risk** and identify **early warning indicators**. Using structured SQL analysis, we assessed portfolio-level default rates, borrower risk segments, loan product risk, and repayment behavior patterns.

The analysis reveals that **default risk is not random**—it is strongly associated with **low credit scores, prior defaults, late/partial repayments, and certain loan structures**. By combining demographic, behavioral, and historical credit signals, we demonstrate how banks can **proactively identify high-risk loans before default occurs**, enabling better approval decisions, pricing adjustments, and risk mitigation strategies.

🔑 Key Business Insights

1️⃣ Portfolio Risk Baseline

- ❖ The overall loan portfolio shows a **measurable default rate**, establishing a clear risk baseline.
- ❖ Defaults are concentrated in **specific customer and loan segments**, not evenly distributed.

2️⃣ Customer Risk Segmentation

- ❖ **Low credit score customers (<650)** have significantly higher default rates.

- Customers with **prior defaults** are much more likely to default again.
- Lower-income segments show elevated risk compared to mid/high-income borrowers.

3️⃣ Loan Product Risk

- Certain **loan types and longer loan terms** exhibit higher default rates.
- Larger loan amounts increase exposure, even when default rates are similar.

4️⃣ Repayment Behavior as Early Warning

- **Late payments** and **partial payments** are strong early indicators of default.
- These behavioral signals often appear **well before formal default**, making them highly actionable.

5️⃣ High-Risk Loan Identification

- By combining:
  - Credit score
  - Prior defaults
  - Late payments
  - Partial payments
- We successfully classified loans into **Low, Medium, and High Risk** buckets.
- This mirrors how **real-world credit risk monitoring systems** operate.

🎯 *Business Recommendations*

✅ 1. Strengthen Approval Criteria for High-Risk Borrowers

- Apply stricter checks or higher interest rates for:
  - Low credit score customers
  - Borrowers with prior defaults

- ❖ Consider conditional approvals or reduced loan amounts.

✅ 2. Introduce Early Warning Monitoring

- ❖ Flag loans with:
  - ➢ Repeated late payments
  - ➢ Partial payments
- ❖ Trigger proactive actions such as customer outreach or payment restructuring.

✅ 3. Risk-Based Loan Pricing

- ❖ Adjust interest rates based on combined risk score.
- ❖ High-risk borrowers should compensate for increased default probability.

✅ 4. Product & Term Optimization

- ❖ Re-evaluate long-term and high-risk loan products.
- ❖ Introduce shorter tenure or staged disbursements for risky segments.

✅ 5. Focus on Prevention, Not Recovery

- ❖ Early identification of risky loans is **far cheaper** than post-default recovery.
- ❖ Behavioral monitoring should be embedded into routine risk dashboards.

📈 Overall Business Value Delivered

- ❖ Enabled **data-driven credit risk assessment**
- ❖ Reduced potential loan losses through **early risk detection**
- ❖ Improved loan approval quality and portfolio stability
- ❖ Supported smarter pricing and product design decisions
- ❖ Demonstrated how SQL can power **real-world banking analytics**
