Project Summary – Farmer & Market Insights NAME:- Deepthi Paidi

# 🎯 Objective

This project aims to analyze the relationships between farmers, advisors, and crop market conditions using structured SQL queries on two relational datasets:  
- FarmerAdvisors  
- MarketResearcher

# 📊 Key Insights from SQL Analysis

🔹 Q1: Top 5 Locations with Most Advisor-Farmer Connections  
- Identified key districts with high farmer engagement. Useful for targeting advisory programs and government schemes.

🔹 Q2: Average Market Price per Crop  
- Revealed high-value crops based on market trends. Can guide future farming decisions and subsidies.

🔹 Q3 & Q4: Crop Diversity per Farmer  
- Found farmers with high crop diversity. Highlighted specialized vs diversified growers.

🔹 Q5: Volatile Crop Prices  
- Crops with ₹10+ price fluctuation across locations identified. Helps in flagging unstable markets for those crops.

🔹 Q6: Advisors Handling Same Crop in Multiple Districts  
- Helps assess the regional influence and workload of advisors.

🔹 Q7: Profit Ranking per Crop  
- Used RANK() to identify most profitable crops per unit. Supports subsidy and investment decisions.

🔹 Q8: Locations with Market Price >20% Above Average  
- Pinpoints potential market monopolies or seasonal effects.

🔹 Q9: Farmers Assigned to a Single Advisor for All Crops  
- Good indicator of advisor dependency or trust.

🔹 Q10: CTE: Farmers Making Below-Average Profit  
- Detects struggling farmers for support or retraining.

🔹 Q11: Price Trend Using Window Function  
- Used LAG() to calculate last 3 price changes per crop. Important for forecasting.

🔹 Q12: Crop Growth Rate Classification  
- Classified as Low (<20%), Medium (20–50%), High (>50%). Counted crops in each growth category.

🔹 Q13: Farmers Selling at Highest District Price  
- Matches farmer supply with high demand zones.

🔹 Q14: Advisors Handling High Growth Crops  
- Identifies high-performing advisors.

🔹 Q15: Duplicate Crop Entries  
- Detected data quality issues for cleansing.

🔹 Q16: Crops Not Listed in MarketResearcher Table  
- Helps expand or update the crop market database.

🔹 Q17: Best Location per Crop by Profit Margin  
- Helps in crop-location alignment for better yield returns.

🔹 Q18: Second-Highest Market Price per District  
- Supports price tiering and price trend observations.

🔹 Q19: Advisors with >5 Distinct Crops  
- Indicates advisor versatility or over-assignment.

🔹 Q20: Consistent Crop Growers (All Seasons)  
- Detects mono-cropping practices for soil management policies.

# 🧠 Techniques Used

- CTE, RANK(), DENSE\_RANK(), ROW\_NUMBER()  
- JOINs, GROUP BY, HAVING, CASE  
- LAG(), LEAD() – Window functions  
- COALESCE(), ISNULL() for handling nulls  
- Subqueries and Derived Tables  
- String handling (TRIM, SUBSTRING)

# 📌 Conclusion

This SQL-based analysis delivers actionable insights for:  
- Improving advisory services  
- Boosting crop profitability  
- Identifying at-risk farmers  
- Enhancing data quality  
- Supporting agricultural policy decisions