**Part 3: SQL Programming**

**-- 1. Monthly Income vs Expenses**

**SELECT**

YEAR(date) as year,

MONTH(date) as month,

SUM(CASE WHEN type = 'income' THEN amount ELSE 0 END) as total\_income,

SUM(CASE WHEN type = 'expense' THEN amount ELSE 0 END) as total\_expenses,

SUM(CASE WHEN type = 'income' THEN amount ELSE -amount END) as net\_savings

FROM Transactions

GROUP BY YEAR(date), MONTH(date)

ORDER BY YEAR(date), MONTH(date);

**-- 2. Top 5 Expense Categories**

**SELECT**

tag,

SUM(amount) as total\_amount

FROM Transactions

WHERE type = 'expense'

GROUP BY tag

ORDER BY total\_amount DESC

LIMIT 5;

**-- 3. Daily Spending Pattern**

**SELECT**

DAYNAME(date) as day\_of\_week,

AVG(amount) as avg\_daily\_expense

FROM Transactions

WHERE type = 'expense'

GROUP BY DAYNAME(date)

ORDER BY FIELD(day\_of\_week, 'Monday', 'Tuesday', 'Wednesday', 'Thursday', 'Friday', 'Saturday', 'Sunday');

**-- 4. User Spending Comparison**

**SELECT**

u.fullName,

SUM(CASE WHEN t.type = 'expense' THEN t.amount ELSE 0 END) as total\_expenses,

AVG(CASE WHEN t.type = 'expense' THEN t.amount ELSE NULL END) as avg\_expense\_amount

FROM Users u

LEFT JOIN Transactions t ON u.id = t.UserId

GROUP BY u.id, u.fullName

ORDER BY total\_expenses DESC;

**-- 5. Monthly Savings Rate**

**SELECT**

YEAR(date) as year,

MONTH(date) as month,

(SUM(CASE WHEN type = 'income' THEN amount ELSE 0 END) -

SUM(CASE WHEN type = 'expense' THEN amount ELSE 0 END)) /

SUM(CASE WHEN type = 'income' THEN amount ELSE 0 END) \* 100 as savings\_rate

FROM Transactions

GROUP BY YEAR(date), MONTH(date)

ORDER BY YEAR(date), MONTH(date);