

Database Skills Demonstration

The following exercises should be completed on a localhost database named ‘SQL\_Sample’.

Schema Preparation:

CREATE TABLE LoanPeriod (

PeriodId INT NULL,

LoanId INT NULL,

Balance DECIMAL(19, 2),

DelinquencyStatus INT NULL

);

CREATE TABLE Loan (

LoanId INT NULL,

DealId INT NULL,

MaturityDate DATE NULL,

OriginalAmount DECIMAL(19 , 2)

);

CREATE TABLE Deal (

DealId INT NULL,

DealName VARCHAR(10) NULL

);

INSERT INTO LoanPeriod VALUES

(1, 1, 241844.00, 0),

(1, 2, 463521.00, 0),

(1, 3, 352657.00, 0),

(1, 4, 645342.00, 3),

(1, 5, 531210.00, 0),

(1, 6, 521201.00, 0),

(1, 7, 443231.00, 0),

(1, 8, 601201.00, 1),

(2, 1, 241844.00, 1),

(2, 2, 451321.00, 0),

(2, 3, 350543.00, 0),

(2, 4, 645342.00, 4),

(2, 5, 529321.00, 0),

(2, 6, 519321.00, 0),

(2, 7, 441209.00, 0),

(2, 8, 601201.00, 2);

INSERT INTO Deal VALUES

(1, 'SQ101'),

(2, 'SQ131'),

(3, 'SQ132');

INSERT INTO Loan VALUES

(1, 1, '2026-07-01', 243546.00),

(2, 1, '2031-02-01', 465764.00),

(3, 1, '2035-03-01', 354657.00),

(4, 1, '2029-06-01', 645342.00),

(5, 1, '2027-11-01', 534231.00),

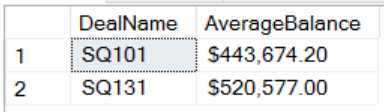
(6, 2, '2034-12-01', 523421.00),

(7, 2, '2033-11-01', 445231.00),

(8, 2, '2037-09-01', 601201.00);

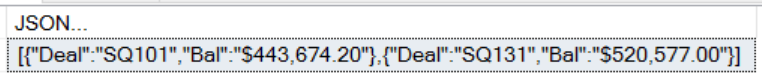
Using the data loaded above, two sets of queries will give you an opportunity to demonstrate some of your data skills.

The first set of queries focus on the average loan balance for each deal during period 2. Write queries to return rows in the formats show.

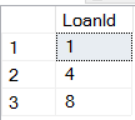
Query 1: Standard format:



Query 2: Concatenated lists:



Query 3: Key:Value pairs:

The second set of queries return the list of loans that had a change in delinquency status between period 1 and period 2.

Query 4: Use a JOIN

Query 5: Use a Window Function

Query 6: Use a Set Operator

--First Result Set: What was the average loan balance for each deal during period 2?

--Standard Returned Rows

SELECT Deal.DealName, FORMAT(AVG(LoanPeriod.Balance), 'C', 'en-us') AS 'AverageBalance'

FROM Deal

JOIN Loan ON Deal.DealId = Loan.DealId

JOIN LoanPeriod ON Loan.LoanId = LoanPeriod.LoanId

WHERE LoanPeriod.PeriodId = 2

GROUP BY Deal.DealName;

--Concatenated lists

WITH averages AS

(

SELECT Deal.DealName

, FORMAT(AVG(LoanPeriod.Balance), 'C', 'en-us') AS 'AverageBalance'

FROM Deal

JOIN Loan ON Deal.DealId = Loan.DealId

JOIN LoanPeriod ON Loan.LoanId = LoanPeriod.LoanId

WHERE LoanPeriod.PeriodId = 2

GROUP BY Deal.DealName

)

SELECT STRING\_AGG(DealName, ', ') AS 'Deals'

, STRING\_AGG(AverageBalance, ', ') AS 'Averages'

FROM averages;

--Key Value Pairs

SELECT Deal.DealName AS 'Deal', FORMAT(AVG(LoanPeriod.Balance), 'C', 'en-us') AS 'Bal'

FROM Deal

JOIN Loan ON Deal.DealId = Loan.DealId

JOIN LoanPeriod ON Loan.LoanId = LoanPeriod.LoanId

WHERE LoanPeriod.PeriodId = 2

GROUP BY Deal.DealName

FOR JSON AUTO

--Second Result Set

--Which loans had a change in delinquency status between period 1 and period 2?

--Join

SELECT P1.LoanId

FROM LoanPeriod P1

JOIN LoanPeriod P2 ON P1.LoanId = P2.LoanId

WHERE P1.PeriodId = 1

AND P2.PeriodId = 2

AND P1.DelinquencyStatus <> P2.DelinquencyStatus;

--Window Function

WITH Loan\_CTE AS (

SELECT LoanId

, DelinquencyStatus

, LAG(DelinquencyStatus) OVER(PARTITION BY LoanId ORDER BY PeriodId) AS 'Prior'

FROM LoanPeriod

)

SELECT LoanId

FROM Loan\_CTE

WHERE DelinquencyStatus <> Prior

--Set Operator

WITH DelinquencyChange

AS (

SELECT LoanId, DelinquencyStatus

FROM LoanPeriod

WHERE PeriodId = 1

EXCEPT

SELECT LoanId, DelinquencyStatus

FROM LoanPeriod

WHERE PeriodId = 2

)

SELECT LoanId

FROM DelinquencyChange