SQL Developer Task 4: Window Functions

Objective: Utilize SQL window functions to rank students and perform cumulative analysis.

Step 1: Create and Populate the Students Table

CREATE TABLE Students (

StudentID INT PRIMARY KEY,

Name VARCHAR(50),

MathScore INT,

TotalScore INT

);

INSERT INTO Students (StudentID, Name, MathScore, TotalScore)

VALUES

(1, 'Alice', 85, 250),

(2, 'Bob', 90, 260),

(3, 'Charlie', 78, 230),

(4, 'David', 92, 270),

(5, 'Eve', 88, 290);

Step 2: Tasks to Perform

Task 1: Rank Students Based on Total Scores

-- Query Objective: Use the RANK() function to assign ranks to students based on their TotalScore.

-- Query Explanation:

-- - Use RANK() OVER (ORDER BY TotalScore DESC) to rank students in descending order of their total scores.

-- - If two students have the same score, they receive the same rank, and the next rank is skipped.

SELECT

StudentID,

Name,

TotalScore,

RANK() OVER (ORDER BY TotalScore DESC) AS Rank

FROM

Students;

Task 2: Calculate Running Totals for Math Scores

-- Query Objective: Use the SUM() function with OVER() to calculate running totals of MathScore ordered by StudentID.

-- Query Explanation:

-- - Use SUM(MathScore) OVER (ORDER BY StudentID) to compute a cumulative total.

-- - This provides the total Math score up to each student in the specified order.

SELECT

StudentID,

Name,

MathScore,

SUM(MathScore) OVER (ORDER BY StudentID) AS RunningTotal

FROM

Students;

Step 3: Validation

-- 1. Cross-check results for correctness.

-- 2. For rankings, ensure the ranks align with descending total scores.

-- 3. For cumulative totals, ensure each row displays the correct running total.

Step 4: Documentation

-- 1. Save query screenshots.

-- 2. Record the output tables.

-- 3. Summarize findings and insights into student performance based on scores and cumulative analysis.

-- Deliverables:

-- 1. Query Results:

-- - Rank of students by total scores.

-- - Running totals of Math scores.

-- 2. Query Explanations:

-- - Detailed explanations for RANK() and SUM() OVER usage.

-- 3. Summary of Findings:

-- - Insights into student performance based on scores and cumulative analysis.