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SQL ASSESSMENT WORKBOOK 4

V1: INSTITUTION PARTNERSHIP ANALYSIS

**EduFin SQL Skill Assessment Workbook:**

***A Practical Guide to Competitive Intelligence, Window Functions, and Customer Segment Trend Analysis***

**Program: Skill AI Path – Data Analyst Pretraining Track**

**Module: EduFin Performance Optimization Simulation – Session 4**

**Assessment Type: Skill Validation – Window Functions + Competitive Benchmarking + Trend Detection**

**Prepared For: EduFin Data Analyst Cohort**

**Objective**

To assess and validate your ability to use advanced window functions, perform ranking and segmentation, compare institution and customer segment performance, and detect market share shifts and growth patterns — preparing you for real-world competitive analytics in the financial sector.

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# SQL Skill Check Assessment – Pretraining Workbook

## Part A: Query Writing (60 points - 6 questions × 10 points)

**Question 1 (10 points):**  
Create a ranking analysis of institutions showing ROW\_NUMBER, RANK, and DENSE\_RANK by total portfolio value, along with NTILE(4) to create quartiles. Include performance classification based on quartile positions.

**Answer:**

**Question 2 (10 points):**  
Use FIRST\_VALUE and LAST\_VALUE to compare each institution's performance against the best and worst performers in their tier, showing gaps in portfolio value and default rates.

**Answer:**

**Question 3 (10 points):**  
Build a trend analysis using LAG and LEAD functions to show month-over-month growth in loan originations for each institution, including growth percentage calculations.

**Answer:**

**Question 4 (10 points):**  
Create a rolling 6-month analysis showing moving averages of loan volume and cumulative year-to-date totals for each institution using custom window frames.

**Answer:**

**Question 5 (10 points):**  
Develop a market share analysis showing each institution's percentage of total loans, portfolio value, and customers, along with competitive rankings across these dimensions.

**Answer:**

**Question 6 (10 points):**  
Build a comprehensive performance benchmarking query that compares each institution against industry averages and tier averages using multiple window functions, including a composite performance score.

**Answer:**

## Part B: Multiple Choice Questions (40 points - 10 questions × 4 points)

❗ Select the correct option and explain if needed.

**Question 7:** What's the difference between RANK() and DENSE\_RANK()?

* A) No difference
* B) DENSE\_RANK() doesn't skip numbers after ties
* C) RANK() is faster
* D) DENSE\_RANK() handles NULLs better

**Answer:**

**Question 8:** What does NTILE(4) create?

* A) Top 4 records
* B) 4 equal groups (quartiles)
* C) 4 random samples
* D) 4 percentiles

**Answer:**

**Question 9:** Which window frame gets the previous 3 rows?

* A) ROWS 3 PRECEDING
* B) ROWS BETWEEN 3 PRECEDING AND CURRENT ROW
* C) RANGE 3 PRECEDING
* D) Both A and B

**Answer:**

**Question 10:** What does LAG(column, 2) return?

* A) Value from 2 rows ahead
* B) Value from 2 rows behind
* C) 2nd largest value
* D) 2nd smallest value

**Answer:**

**Question 11:** In FIRST\_VALUE with default frame, what value is returned?

* A) First value in partition
* B) Minimum value
* C) First value in current row group
* D) Random first value

**Answer:**

**Question 12:** What does PERCENT\_RANK() calculate?

* A) Percentage of total
* B) Relative rank as percentage (0–1)
* C) Top percent
* D) Average percentage

**Answer:**

**Question 13:** Which creates a 3-month rolling average?

* A) AVG() OVER (ROWS 3 PRECEDING)
* B) AVG() OVER (ROWS 2 PRECEDING)
* C) AVG() OVER (ROWS BETWEEN 2 PRECEDING AND CURRENT ROW)
* D) Both B and C

**Answer:**

**Question 14:** What's the purpose of PARTITION BY in window functions?

* A) Sorts data
* B) Filters data
* C) Creates separate groups for calculations
* D) Joins tables

**Answer:**

**Question 15:** Which handles ties differently: ROW\_NUMBER() or RANK()?

* A) No difference
* B) ROW\_NUMBER() assigns unique numbers, RANK() gives same rank to ties
* C) RANK() is always unique
* D) ROW\_NUMBER() skips numbers after ties

**Answer:**

**Question 16:** What does UNBOUNDED PRECEDING mean in window frames?

* A) Previous row only
* B) Start of partition
* C) No limit backwards
* D) Both B and C

**Answer:**

## PASSING CRITERIA & VALIDATION

**Scoring Requirements:**

* **Minimum Overall Score:** 80% (80 out of 100 points)
* **Query Writing:** Must score at least 48/60 (80%)
* **Multiple Choice:** Must score at least 32/40 (80%)
* **Unlimited Attempts:** Retake until 80% achieved
* **Time Limit:** 180 minutes per attempt (extended for complexity)

## Skills Validation Checklist

Upon achieving 80%, you will demonstrate:

* ✅ Window function mastery (ROW\_NUMBER, RANK, DENSE\_RANK, NTILE)
* ✅ Comparative analysis functions (FIRST\_VALUE, LAST\_VALUE)
* ✅ Trend analysis capabilities (LAG, LEAD)
* ✅ Custom window frame construction
* ✅ Competitive positioning analysis
* ✅ Performance benchmarking methodologies
* ✅ Market share calculations
* ✅ Multi-dimensional ranking systems

## STUDY RECOMMENDATIONS

1. **Master the ranking function differences** - ROW\_NUMBER vs RANK vs DENSE\_RANK
2. **Practice window frame syntax** - ROWS vs RANGE, PRECEDING vs FOLLOWING
3. **Understand PARTITION BY logic** - how it creates separate calculation groups
4. **Get comfortable with LAG/LEAD** - essential for trend analysis
5. **Practice complex benchmarking** - comparing against multiple reference points

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