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SQL ASSESSMENT WORKBOOK 5

V1: PORTFOLIO TRENDS & TIME INTELLIGENCE

**EduFin SQL Skill Assessment Workbook:  
*A Beginner-Friendly Guide to Time Intelligence, Period-over-Period Growth, and Predictive Analytics*Program: Skill AI Path – Data Analyst Pretraining Track  
Module: EduFin Temporal Analysis Simulation – Session 5  
Assessment Type: Skill Validation – Time Functions + Rolling Trends + Forecasting  
Prepared For: EduFin Data Analyst Cohort  
Organization: Krishnav Tech | Skill AI Path**

**Objective**

To assess and validate your ability to apply advanced date and time functions, perform period-over-period growth analysis, build cohort and seasonal trend models, and create predictive insights using historical data—preparing you for real-world forecasting and performance monitoring in financial analytics.

# SQL Skill Check Assessment – Pretraining WorkbooK

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

**Question 1 (10 points):**  
Create a month-over-month and year-over-year growth analysis for loan originations, showing growth rates and trend indicators for each month in the last 24 months.

**Answer:**

**Question 2 (10 points):**  
Build a customer registration cohort analysis showing how loan penetration rates and default rates vary by registration month cohorts, including cohort maturity classifications.

**Answer**

**Question 3 (10 points):**  
Develop a rolling 6-month analysis of portfolio performance showing moving averages, cumulative year-to-date metrics, and volatility measures.

**Answer:**

**Question 4 (10 points):**  
Create a loan vintage analysis showing how default rates evolve as loans age, grouped by origination quarter, with performance projections.

**Answer:**

**Question 5 (10 points):**  
Build a seasonal analysis showing loan origination patterns by month and day of week, including seasonal indices and business context explanations.

**Answer:**

**Question 6 (10 points):**  
Design a simple forecasting model using historical trend analysis to predict next quarter's loan volumes, including conservative and optimistic scenarios.

**Answer:**

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

*Choose the correct option and explain if needed.*

**Question 7:** What does DATEDIFF(MONTH, start\_date, end\_date) calculate?

* A) Number of days between dates
* B) Number of months between dates
* C) Difference in years
* D) Calendar difference

**Answer:**

**Question 8:** Which function returns the last day of a month?

* A) MONTHEND()
* B) EOMONTH()
* C) LASTDAY()
* D) MONTH\_LAST()

**Answer:**

**Question 9:** What does LAG(column, 12) OVER (ORDER BY date) return?

* A) Value from 12 days ago
* B) Value from 12 rows back
* C) Value from same period last year (if monthly data)
* D) 12th largest value

**Answer:**

**Question 10:** In cohort analysis, what defines a cohort?

* A) Customer age
* B) Common time period (like registration month)
* C) Customer location
* D) Loan amount

**Answer:**

**Question 11:** What does ROWS 11 PRECEDING in a window function mean?

* A) Previous 11 rows
* B) Previous 12 rows (including current)
* C) Next 11 rows
* D) Random 11 rows

**Answer:**

**Question 12:** Which creates a proper quarter label?

* A) CONCAT('Q', QUARTER(date))
* B) CONCAT('Q', DATEPART(QUARTER, date), '-', YEAR(date))
* C) QUARTER(date) + YEAR(date)
* D) 'Q' + QUARTER(date)

**Answer:**

**Question 13:** What's the purpose of DATEFROMPARTS(year, month, 1)?

* A) Create random date
* B) Create first day of specified month/year
* C) Validate date
* D) Extract date parts

**Answer:**

**Question 14:** In trend analysis, what does a moving average smooth out?

* A) Errors in data
* B) Short-term fluctuations
* C) Long-term trends
* D) Seasonal patterns

**Answer:**

**Question 15:** What does PERCENT\_RANK() OVER (ORDER BY value) calculate?

* A) Percentage of total
* B) Relative position as percentage (0–1)
* C) Percentage change
* D) Percentile group

**Answer:**

**Question 16:** Which window frame calculates year-to-date totals?

* A) ROWS UNBOUNDED PRECEDING
* B) PARTITION BY YEAR(date) ORDER BY date ROWS UNBOUNDED PRECEDING
* C) ROWS 365 PRECEDING
* D) RANGE YEAR PRECEDING

**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:** 200 minutes per attempt (extended for complexity)

## Skills Validation Checklist

Upon achieving 80%, you will have demonstrated:

* ✅ Advanced date/time function mastery
* ✅ Period-over-period analysis capabilities
* ✅ Cohort analysis and lifecycle tracking
* ✅ Trend identification and pattern recognition
* ✅ Rolling and cumulative analysis techniques
* ✅ Seasonal pattern analysis
* ✅ Basic forecasting and projection skills
* ✅ Time intelligence for business decisions

## WHAT'S NEXT: SESSION 5 PREPARATION

After passing this assessment, you're ready for:

* ✅ **Time Intelligence Mastery**
* ✅ **Trend Analysis**
* ✅ **Cohort Analytics**
* ✅ **Forecasting Skills**

**Session 5 Focus:** Apply these time intelligence skills to analyze when the EduFin crisis began, identify temporal patterns in the problem, and create predictive insights for business recovery.

## STUDY RECOMMENDATIONS

1. **Master date function combinations** - DATEDIFF, DATEADD, DATEFROMPARTS
2. **Practice LAG/LEAD with time periods** - essential for period-over-period analysis
3. **Understand window frames with dates** - ROWS vs RANGE
4. **Get comfortable with cohort logic** - lifecycle analysis
5. **Practice trend calculations** - moving averages and growth rates

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