WISE Academy Database Project Documentation

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Problem Definition

WISE Academy, an e-learning company, needs to analyze its sales and enrollment data from the Customers, Products, and Transactions tables. The specific business problems include:
- Identifying the top-selling products (courses) per region and quarter.
- Measuring month-to-month revenue growth across courses.
- Segmenting customers into quartiles based on their total spend.
- Tracking cumulative sales trends to monitor long-term progress.
- Detecting long-term performance through moving averages.

These insights will help management make measurable, data-driven decisions about marketing, promotions, student retention, and resource allocation.

Business Context

WISE Academy is a private education technology institution based in Rwanda. It provides online programming and digital skills training to students and professionals. The Sales & Marketing Department is responsible for promoting courses, acquiring new students, and retaining existing learners. By analyzing transactions using Oracle SQL window functions, WISE Academy can:
- Optimize its marketing campaigns with data-driven insights.
- Identify high-value students and reward or target them for further learning opportunities.
- Improve financial forecasting and detect trends in course popularity and revenue growth.
- Ensure better allocation of instructors and classroom resources.

How the Project Works

This project demonstrates how an Oracle relational database with window functions can address the above problems.

1. Database Schema: Creating normalized tables for customers, products (courses), and transactions.
2. Data Loading: Inserting sample records to simulate sales and enrollment data.
3. Window Function Queries:
- Ranking functions (ROW_NUMBER, DENSE_RANK) to identify top customers or products.
- Aggregate window functions (SUM OVER) to calculate cumulative revenue.
- Navigation functions (LAG, LEAD) to measure growth between months.
- Distribution functions (NTILE, CUME_DIST) to segment students/customers.
- Moving averages to analyze long-term sales patterns.
4. Analysis & Reporting: Queries generate insights for the management team to guide strategy.

This approach ensures better decision-making, reduces errors compared to spreadsheets, and supports scalable reporting.

Results & Insights

Each SQL analytic query generates actionable insights:

- Ranking Queries: Identify the top 5 courses and top-spending students, enabling targeted promotions.
- Aggregate Queries: Running totals reveal revenue growth trends and highlight steady or declining courses.
- Navigation Queries: Month-over-month growth percentages indicate which courses are gaining or losing momentum.
- Distribution Queries: Quartile segmentation groups customers by spend, supporting targeted marketing campaigns.
- Moving Averages: Smooths short-term fluctuations to reveal long-term sales performance and growth opportunities.

These outputs guide management in resource allocation, marketing budget decisions, and student engagement strategies.

Academic Integrity Statement

I, BYIRINGIRO Urban Bobola, confirm that this assignment is my own original work. I used publicly available documentation, lectures, and textbooks to complete it. I have not received unauthorized assistance, nor have I shared my completed work with others. Any external resources I consulted are properly referenced.

I fully understand that plagiarism, unauthorized use of AI-generated content, or academic dishonesty of any form may result in a failing grade or further disciplinary action as outlined by AUCA’s academic integrity policy.

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