

Data-Driven Insights from an Online Learning Platform

Exploratory Analysis using SQL

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Dataset Overview



The dataset represents an online learning platform, designed to analyze student behavior, course performance, and overall learning engagement. It helps answer business and learning-related questions using SQL analytics.

Key areas covered :

- Student enrollment patterns and activity levels
- Course popularity and completion trends
- Learning engagement (active, inactive, completed learners)
- Revenue contribution by students and courses
- Identification of high-value students and low-engagement courses



Dataset Description

Table name	Description
students	student_id, full_name, email, city, signup_date
instructors	Instructor_id, instructor_name, expertise, join_date, city
courses	course_id, course_name, category, instructor_id, price
enrollments	enrollment_id, student_id, course_id, enroll_date
course_progress	progress_id, enrollment_id, completed_percent, last_access_date

Key SQL Concepts Used

1. Data Aggregation

- Used COUNT, SUM, AVG, MAX, and MIN

2. GROUP BY & HAVING

3. Joins

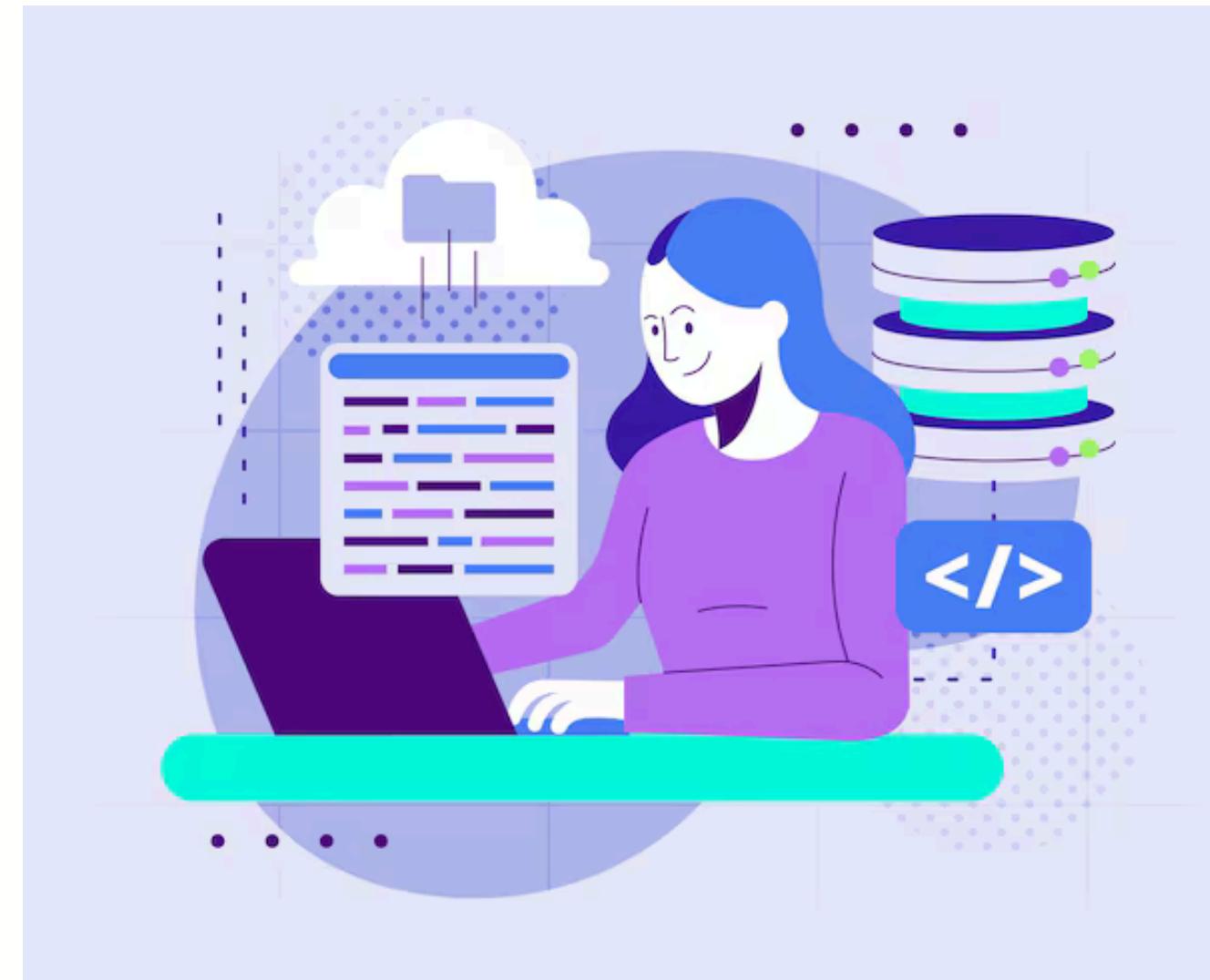
- Combined multiple tables using:
 - INNER JOIN
 - LEFT JOIN
 - CROSS JOIN

4. Window Functions

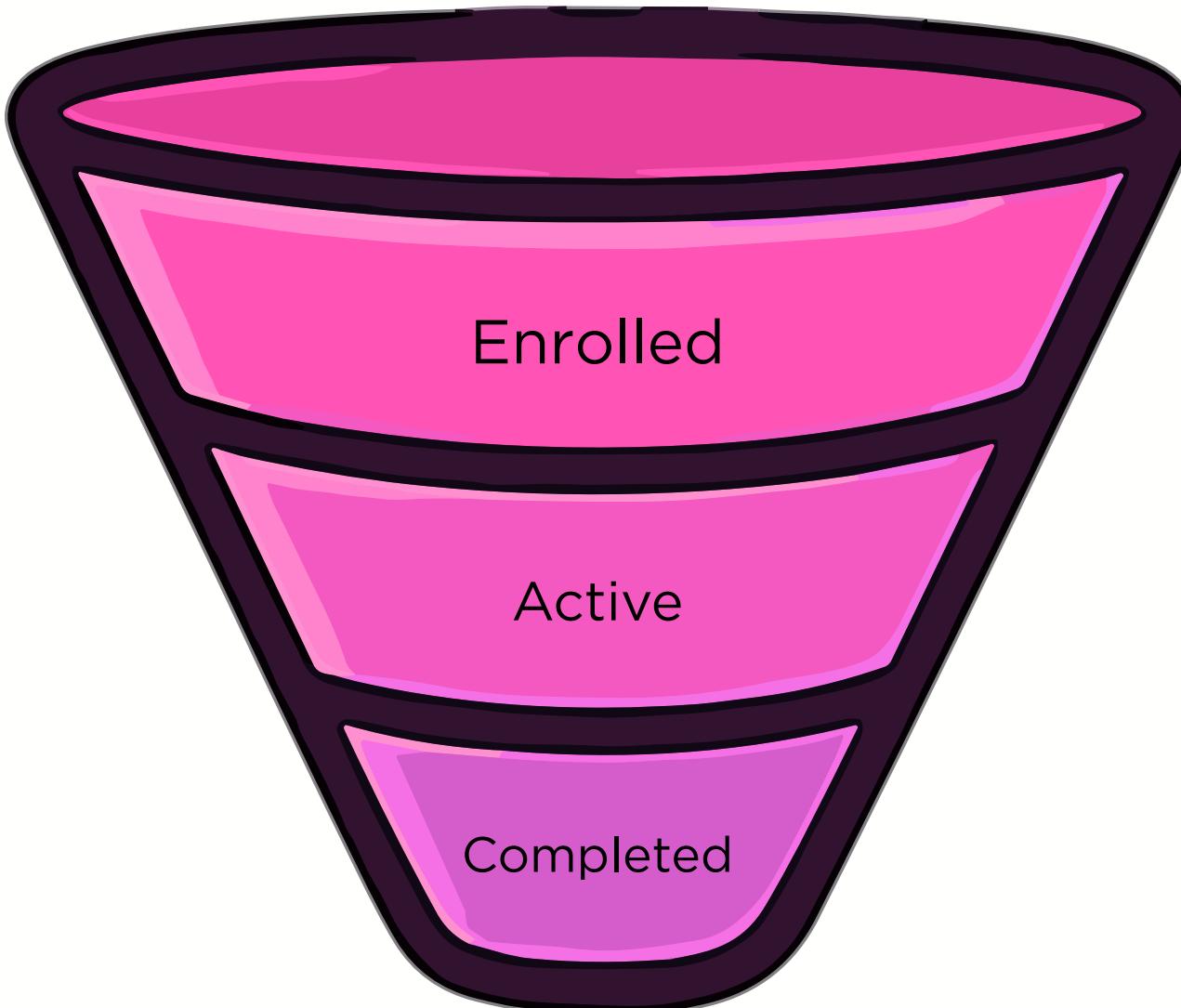
- Used functions like:
 - RANK, DENSE_RANK, LAG, LEAD, NTILE

5. Conditional Logic (CASE Statements)

6. Common Table Expressions (CTEs)



Visualizing Funnel Analysis: From Enrollment to Completion



- ◆ Enrolled Learners(1978)
Students who signed up and enrolled in at least one course.
→ Represents initial interest and reach of the platform.
- 1.
- ◆ Active Learners(1964)
Students who started learning (showed any progress).
→ Indicates engagement after signup.
- ◆ Completed Learners(376)
Students who fully completed a course (100% completion).
→ Reflects learning success and content effectiveness.

Key Insights

1. Student Engagement Patterns

- A significant portion of students enroll but show low or zero progress.
- Engagement drops noticeably after initial enrollment, indicating early drop-offs.

2. Course Performance Insights

- Some courses have high enrollments but low average completion rates, signaling possible content or difficulty issues.
- A few courses consistently show high completion, indicating strong learner-course fit.

3. Revenue & Value Contribution

- A small group of students contributes a large share of total platform revenue.
- Premium-priced courses drive disproportionate value despite fewer enrollments.

4. Learning Progress Trends

- Month-over-month analysis shows fluctuating enrollment growth.
- Completion rates improve gradually for active learners but stagnate for inactive ones.

5. Behavioral Segmentation

- Students can be clearly segmented into:
 - Inactive learners (enrolled, no progress)
 - Active learners (partial completion)
 - Completed learners (100% completion)

Platform-Level Learning Health Summary

While the platform has a healthy number of enrolled students, a visible drop-off between active and completed learners suggests engagement challenges. This indicates a need to improve onboarding, course structure, or learner motivation strategies

The learning health label is derived from three key indicators:

- Total Students – Number of unique learners on the platform
- Active Learners – Students who have started at least one course
- Completed Learners – Students who have fully completed at least one course^{1.}

These metrics together indicate how engaged learners are after enrollment.

The platform is classified as Moderate Engagement because:

A good number of students are active, meaning they have started learning

However, completion rates are noticeably lower than enrollment rates

This indicates that learners are engaging initially but not consistently completing courses

Business Recommendation

Based on the analysis of enrollments, completion rates, engagement trends, and revenue contribution, the following actionable recommendations can be carried out:

📌 Improve Learner Engagement

- Introduce early-stage nudges (emails, reminders, onboarding walkthroughs) for students who enroll but show low or zero progress.

📌 Optimize Course Portfolio

- Courses with high enrollments but low completion rates should be reviewed for content quality, difficulty level, or structure.
- Invest more in high-performing courses (high enrollment + high completion) through promotions and advanced versions.

📌 Target High-Value Students

- Identify and reward high-spending students with exclusive content, certifications, or loyalty benefits.
- Personalized recommendations can help increase lifetime value.

📌 Instructor & Content Strategy

- Share insights with instructors on completion and engagement trends to improve course design.
- Encourage best practices from courses with strong learner outcomes.

📌 Data-Driven Decision Making

- Regularly monitor monthly enrollment and completion trends to detect declines early.
- Use learning health labels (Active, Moderate, Low engagement) to guide platform-level interventions.



Thank you!

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