# Task: Data warehouse Project

## Description:

Title: University Database Analysis Project

The "University Database Analysis Project" is designed to evaluate your proficiency in SQL, database creation, restoration, data analysis, and result reporting. This project provides you with the flexibility to choose any database for analysis. While the examples and tasks are based on a hypothetical university database named "University DB," which contains information about students, departments, courses, and enrollment data…. etc... Feel free to substitute it with a database of your choice.

## Task 1: Database Creation or Restoration

In SSMS, you need to create or restore a database. Follow the steps below based on your choice:

**a. Create a new database:**

Write a SQL script to create a new database named "UniversityDB."

Include at least three tables with appropriate columns, data types, and primary/foreign keys.

**b. Restore an existing database:**

Assume you have a backup file named "UniversityBackup.bak" located at "C:\Path\To\Your\Backup.bak."

Write an SQL script to restore the "UniversityDB" from the backup file.

## Task 2: Data Analysis

Perform data analysis on the "UniversityDB" database. Write SQL queries to answer the following questions:

**a. Count of Students by Department:**

Write a query to count the number of students in each department.

**b. Total Enrollment by Year:**

Write a query to calculate the total enrollment for each academic year.

**c. Average GPA by Course:**

Write a query to find the average GPA for each course.

## Task 3: Query (Breakdown, Rollup, or Cube)

Write SQL queries to perform breakdown, rollup, and cube operations on the "UniversityDB." Use the following steps:

**a. Breakdown by Department:**

Write a query to break down the enrollment by department.

**b. Rollup by Year and Department:**

Write a query to roll up the enrollment by academic year and department.

**c. Cube by Course, Year, and Department:**

Write a query to create a cube of enrollment by course, academic year, and department.

# Task 4: Result Reports with Charts or Graphs

Create result reports with charts or graphs based on the analysis in Task 2. Use the following steps:

**a. SSRS (Optional):**

If SSRS is available, launch Report Builder from SSMS.

Design a report that visualizes the analysis results using charts or graphs.

**b. Power BI (Optional):**

Export the result of one of your queries to a CSV file.

Import the data into Power BI and create visualizations.

**c. Other Tools (Optional):**

It's completely acceptable to use any other reporting tool of your choice.

You may consider tools like Tableau, Excel, or Google Data Studio.

Ensure the tool allows you to create visualizations based on your analysis results.

# Task 5: Documentation

Document your entire process, including SQL scripts, queries, and any challenges faced.

**a. Create a README file:**

Write a README file that includes step-by-step instructions for each task.

Include comments in your SQL scripts for clarity.

# Submission Guidelines:

- ✓ Submit your SQL scripts, query results, and any additional files as a compressed archive (ZIP).
- ✓ Include your README file that details the steps taken in each task.
- ✓ If you encounter any challenges or limitations, document them in your README file.

You are free to use any SQL tool of your choice, including SQL Server Management Studio (SSMS), which was demonstrated during the session.

Optionally, you can explore other tools like Power BI for results reporting, but this is entirely at your discretion.

The project is adaptable to different preferences and tool sets. Feel free to use one or multiple tools based on your comfort and requirements.