BSc (Hons) in Information Technology
Specializing in Data Science

IT3021 – Data Warehousing and Business Intelligence
Year 3

Assignment 02 **Semester 01, 2025**

Complete following tasks and demonstrate the same with SQL Server (any version & edition). Additionally, document the steps followed in completing the tasks. Include the screen shots of the steps you followed with a short description for each step in the report and submit before the deadline.

Step 1: Data source for the assignment 2 (5 marks)

- Use the data warehouse you implemented and loaded with data in assignment 1 as the data source for the assignment 2.

Documentation: provide a description of the data source; your data warehouse. You may use ER-diagrams to aid your description.

Step 2: SSAS Cube implementation (20 marks)

- Use data warehouse as the data source and create an SSAS cube.
- Design the cube by including necessary measures in fact table(s) and connecting dimensions.
- Implement at least one hierarchy in the cube.

Documentation: describe the steps you followed when creating the SSAS project.

Step 3: Demonstration of OLAP operations (25 marks)

- Connect an Excel workbook to the Cube. You may use connecting Excel workbook using features available in ***Data*** tab or ***POWERPIVOT*** mode.
- By creating Pivot Tables or Pivot Charts or Power View dashboards, demonstrate OLAP operations
  - Roll-up
  - Drill-Down
  - Slice
  - Dice
  - Pivot

Documentation: describe the steps you followed when creating the Excel visualizations.

Step 4: PowerBI Reports (50 marks)

- Develop and publish the following reports in **Power BI Service**. Reports should be demonstrated by opening them in Power BI Service (online).

    - **Report 1**: Create a report with a Matrix visual to display detailed tabular data with row and column groupings.

    - **Report 2**: Create a report with multiple slicers (parameters). Slicers should include lists of values, and selecting a value in the first slicer should dynamically filter the options in the second slicer (implement cascading filters). Use multiple visuals (charts/graphs) in the report to present insights from the data.

    - **Report 3**: Create a drill-down report that allows users to explore data hierarchically (e.g., from year to quarter to month).

    - **Report 4**: Create a drill-through report that lets users right-click on a visual and navigate to a detailed page showing related information.

Documentation: Describe the steps you followed while creating each Power BI report, including data preparation, modeling, use of DAX (if applicable), and visual design.

You may use any internet resources (MSDN) to get an idea about how to develop above components.

Marks will be based on:

- Completeness of the design of the CUBE (fats, dimensions, hierarchies in the CUBE).
- Demonstration of OLAP operations in Excel.
- Demonstration of PowerBI reports and completeness and correctness of reports.

Submission Method:

1. Create a folder named 'DataWarehouse_ITXXXXXXXX' and put the backup of the data warehouse into this folder.
2. Create a folder named 'CubeProject_ITXXXXXXXX' and put the SSAS (SSDT) solution into this folder.
3. Create a folder named 'Excel_ITXXXXXXXX' and put Excel workbook(s) into this folder.
4. Create a folder named 'PowerBIReports_ITXXXXXXXX' and put report files into this folder.
5. Create a folder named 'Document_ITXXXXXXXX' and put your document in PDF format into this folder. (Separate link will be given to upload the report as well. Report should be available in both locations.)
6. Create a folder named 'DWBI_Assignment_02_Answer_ITXXXXXXXX' and copy all following folders into it.
    a. DataWarehouse_ITXXXXXXXX
    b. CubeProject_ITXXXXXXXX
    c. Excel_ITXXXXXXXX
    d. PowerBIReports_ITXXXXXXXX
    e. Document_ITXXXXXXXX

Finally, zip the 'DWBI_Assignment_02_Answer_ITXXXXXXXX and submit.

NOTE: Name the ZIP folder you submit with your student ID.