Data warehouses
Lab 1

Basic Environment preparation

1. Get and access MS SQL Server 2019 (Developer edition).
2. Download and install Azure Data Studio or SQL Server Management Studio.
3. Deploy or access AdventureWorks sample database to the server.
4. Play around this interface to get yourself familiar with the type of meta-information that is available here. Try to explore the data and structure of this database.
5. Create a new SQL query against the AdventureWorks database.
    a. Write a SQL query to get names and list prices of all available products (use table Production.Product, use Name and ListPrice attributes) with list price above 2500 USD.
    b. Run query.
    c. Figure out how to export the results to the CSV file.

Playing with AdventureWorks

Analyze the AdventureWorks Database. This is a database of a bicycle manufacturer (AdventureWorks Cycles). This sample database contains the scenarios of Manufacturing, Sales, Purchasing, Product Management, Contact Management and Human Resources.

AdventureWorks is a sample database created for use in demos and training on each version of Microsoft SQL Server. The name AdventureWorks refers to a fictitious large, multinational manufacturing company. "The company manufactures and sells metal and composite bicycles to North American, European and Asian commercial markets. While its base operation is located in Bothell, Washington with 290 employees, several regional sales teams are located throughout their market base. In 2000, Adventure Works Cycles bought a small manufacturing plant, Importadores Neptuno, located in Mexico. Importadores Neptuno manufactures several critical subcomponents for the Adventure Works Cycles product line. These subcomponents are shipped to the Bothell location for final product assembly. In 2001, Importadores Neptuno became the sole manufacturer and distributor of the touring bicycle product group. Coming off a successful fiscal year, Adventure Works Cycles is looking to broaden its market share by targeting their sales to their best customers, extending their product availability through an external Web site, and reducing their cost of sales through lower production costs.

AdventureWorks Sample Databases:
https://technet.microsoft.com/en-us/library/ms124501(v=sql.100).aspx
AdventureWorks basic information:

- Business scenarios:
    - http://technet.microsoft.com/pl-pl/library/ms124825
- Schemas:
    - http://technet.microsoft.com/pl-pl/library/ms124894(v=sql.100).aspx
- Data Dictionary:
    - https://technet.microsoft.com/en-US/library/ms124438(v=SQL.100).aspx
    - http://www.sqldatadictionary.com/AdventureWorks2014/database.html
    - **https://dataedo.com/download/AdventureWorks.pdf** (focus on this document)

Using the technical description (PDFs above) and SQL Server Management Studio analyze the AdventureWorks database structure and content:

- Focus on sales/order information – as the main business process we are interested in
- Focus on products, clients, employees (salespersons), sales locations – as different entities involved in the main process.

1. Answer the following questions about AdventureWorks database structure:
    a. Identify main tables and attributes related to orders:
        i. Where the detailed information about orders is stored?
        ii. Are there different types of orders?
        iii. Are there different statuses of orders?
        iv. Which numerical data can be used to measure the performance of an order?
    b. Identify main tables and attributes related to products.
        i. Which table(s) contain information related to products, like the product's name?
        ii. Are products organized in some manner, like dairy products, clothes, etc.?
        iii. What additional information about products is available?
    c. Identify main tables and attributes related to different types of customers.
        i. Are there different types of customers – name them?
    d. Identify main tables and attributes related to employees handling orders.
    e. Identify main tables and attributes related to sales locations – at what level of detail sales locations are defined.
    f. How could you define sales in this database? Where is such sales data located?
2. Query AdventureWorks database
    a. Prepare a SQL query that provides information about the global order amount (money) of the AdventureWorks business. (Use SalesOrderHeader table)
    b. Prepare a SQL query that provides information about the global sales amount (money) of the AdventureWorks business. (Use SalesOrderHeader table)
    c. Prepare a SQL query that provides information about the global sales amount (money) and volume (items sold) of the AdventureWorks business. (Use SalesOrderHeader, SalesOrderDetails tables)
    d. Prepare a SQL query that provides information about the sales amount in individual years of the AdventureWorks business. (Use SalesOrderHeader table)
    e. Prepare a SQL query that provides the global profit of the business. (Use SalesOrderHeader, SalesOrderDetails and Product tables) assuming that product’s cost (available in Product table) hasn’t changed over time.