Programming Applications with Databases

Exercise Set 3

1. There is data in a table (pick some table from AdventureWorksLT with a significant amount of data), and this data should be copied to another table with the name {*tablename*}_Backup. Show the difference in time execution between a standard SQL query and cursors by creating two appropriate examples and running appropriate tests.
   [**1p**]

2. Explain the difference between the 3 main types of cursors: static, dynamic, and keyset. Execute the presented example during the lecture *03-rodzaje-kursorow.sql* and explain the results.
   [**1p**]

3. Consider the following tables: *Products(ID, ProductName)*, *Prices(ProductID REF Products(ID), Currency REF Rates(Currency), Price)* where are the products' prices in different currencies, *Rates(Currency, PricePLN)* where are exchange rates for currencies in PLN; remark: this table can change often, both from the prices perspective and from the list of currencies perspective.

   The product price should always be defined in PLN, but there could also be prices in other currencies as a result of the previous update. Prepare a script based on cursors to update the *Prices* table based on *Rates* table. In case there is a row in *Prices* which references a currency that no longer exists in *Rates*, the row should be removed.

   Reflect on whether it is possible to create an SQL query to solve the above. If not, propose what should be simplified or removed so that creating an SQL query would be possible.
   [**2p**]

4. In the AdventureWorksLT database, there is a table SalesLT.Customer with a ModifiedDate attribute. Create a trigger that ensures that, when customer data is modified, the actual server date and time are taken.
   [**1p**]

5. In the AdventureWorksLT database, there is a table SalesLT.Product with StandardCost and List-Price attributes. Create a table to hold the cost and price history, including the date and time when each change occurred (ensure the table name is consistent with the rest of the schema). Then create a trigger that registers all changes (and only changes) in StandardCost and ListPrice values, including the mentioned date and time. Finally, we want to get a report where we can see all costs and prices with periods of time when they were in effect – think what more is needed to get that kind of report (if anything).
   Hint: consider the full lifecycle of the product from creating to deleting.
   [**2p**]

6. The most common use case for INSTEAD OF triggers is operating on views. Understand and execute the example presented in `https://www.sqlservertutorial.net/sql-server-triggers/sql-server-instead-of-trigger/`. During classes, present the whole scenario with explanations.
   [**1p**]

7. Using triggers, implement the foreign key policy in the following extended version: having a book and specimen one-to-many association, ensure that a book may have a maximum of five specimens.
   [**1p**]

8. Get familiar with the concept of DDL triggers described in `https://learn.microsoft.com/en-us/sql/relational-databases/triggers/ddl-triggers`. Create two examples: (a) which prevents dropping or modifying the schema of 3 selected tables, (b) which ensures that added or modified column name starts with a capital letter.
   [**1p**]

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