IT3795 Database Administration Assignment

Objectives

- To apply database administrative tasks and concepts learnt to the given case scenario

Case Scenario

GreenGrocer is a supermarket selling a range of food and other related items. Due to rapid expansion, it is considering moving all their data to SQL Server 2012. A consultant has been engaged to analyze the requirements of the company before it embarks on the project. The findings and recommendations of the consultant are listed below:

Background

The company is running the Windows operating system for their users and currently already has a Windows SQL Server 2012. The database administrator is *sqladmin* which has already been created in the system. All users have Windows logins in the company domain. The data will be accessed only by staff of the company.

A. Database

The consultant has determined that a single database for the supermarket would be enough for the moment. Following best practices, system objects and user data objects should be stored separately on different data files.

Analysis has determined the following
- System objects should be in the primary data file (default settings) in the PRIMARY filegroup
- User objects should be in the secondary data file in the secondary filegroup DATA
- The DATA filegroup should be designated as the default filegroup
- A database of size 100MB (data) to be sufficient
- Data is estimated to be growing at 5% every year
- The database should be allowed to grow automatically but it should not exceed 200MB.
- The log file should be 50% the size of the data with unrestricted growth.

B. Data

The consultant has prepared a script file *IT3795instnwd.sql* which would create the necessary tables and populate them with the existing company data. There will be thirteen tables in all.

Other data objects such as views, indexes will also be created.

C. Logins and Users

A user Lance has been identified to be responsible for the database, i.e. acting as the database owner. He should be allowed access to the database and assume rights of the database owner.

Another user Anders has also been identified to be a frequent user of the database. He should be allowed access to the database as well. However, he should only have read access to all the data objects.

Both users should have their default database set to the new database.

D. Standards and Policies

Since only company staff will be accessing the database, the consultant recommends that the company use Windows authentication for the SQL Server. In addition, the consultant has recommended a schedule of full and transaction log backups. As such, the database (and all future databases) should use the Full recovery model.

The administrator will enforce these two rules by policy checks. These checks should be performed on demand by the administrator as and when necessary.

E. Weekly Reports

The company needs a weekly listing (text file) of the products to be printed for verification. The data will be extracted from the database. An example of the listing (incomplete) is as shown below. Note that column names or number of rows should **NOT** be displayed.

```
Chai                              BEVERAGES    0     $18
Chang                             BEVERAGES    40    $19
Aniseed Syrup                     CONDIMENTS   70    $10
Chef Anton's Cajun Seasoning      CONDIMENTS   0     $22
Chef Anton's Gumbo Mix            CONDIMENTS   0     $21.35
:                                 :            :     :
```

It includes the Product Name, the Category Name, UnitsOnOrder and the Unit Price. The Category Name needs to be in uppercase and the currency symbol must be added to the Unit Price.
This report is a text file and should be exported from the database every Saturday night, hence the parameters should be should be saved for ease of re-run. The file contents will be over-written during every run of the job.

F. PRODUCTS Table Audit Trail

As the Products table is a very important table, the company wishes to track selected changes to the table. Whenever any user tries to delete or update the data in the table, it should be logged into the Windows Application event log. However, there is no need to undo the changes as it may be a legitimate change.

Tasks

As an administrator, you are required to perform all the data administrative tasks required to implement the above recommendation from requirement (A) to (F). You may do so using the *sqladmin* account already created.

- Create the database.
- Populate with data using the script - *IT3795instnwd.sql* provided
  Note: You may need to amend the script to use the database name you created.
- Create the necessary logins, policies, jobs, packages and any other required objects.

You may work in a group of up to 3 students.

Challenge Task (Optional)

Apart from generating the SQL scripts required for the above scenario, you may optionally choose to package the scripts into an easy to run installation package which can be performed in a single step.

Students who attempt the automation of the scripts successfully will be awarded bonus marks.

Assessment

Weight-age of the assignment is 20%

Submission

- The completed answer sheet attached

- Scripts for all tasks that you have performed. The script files should preferably be named in sequence e.g.
  - 1. Create database.sql
  - 2. Create logins.sql
  - …

  The scripts (when run in sequence) should re-create the database you have implemented with all necessary policies, jobs or any other SQL elements that is part of your solution.

- Any other resources that may be part of your solution (that cannot be included in the scripts)

Addendums

Please ensure that you test all your scripts to ensure that they are working. If the scripts fail to execute, your solution cannot be assessed and you may be awarded zero marks.

In addition, you should test your solutions to ensure that case scenario requirements are met. Marks will be awarded for working implementation.

Following are some suggestions on the tests to be performed. They are by no means exhaustive.

Feature	Sample Test
Data	Ensure tables and other objects are created.
Login/User	Login as Lance and make sure he can access your database with required rights Login as Anders and make sure he can access you database to read data only.
Standards and Policies	Change your server security to use Mixed mode. Change the recovery mode of your database Evaluate your policies manually. Verify the results
Weekly Reports	Run your job manually with 'Start Job..' and make sure your data is exported correctly as shown in the sample.
Products table Audit Trail	Update a row in Products table. Delete a row in Products table. Verify that both are logged in Windows Application event log.