

Databases Laboratory Work Nr. 2

The Creation and Maintenance of Database

Prerequisites:

SQL Server 2017, SQL Server Management Studio 2017

Objectives:

- Study Chapter 2;
- Complete the practical tasks.

Tasks:

1. Create a database in the **MyDocuments/Data** folder, fixing the growth of the primary file in 16MB with limit to 128MB and of the log file with growth of 64MB limited to 1024MB. The secondary files should be defined in a new filegroup and with the growth of 64MB limited to 1024MB;

2. Create a database with the log file located in **MyDocuments/Log**, the name of the log file should be different in the OS environment. It is important that the database should be compatible with SQL Server 2017 and to be accessible to only one user at a specific time.

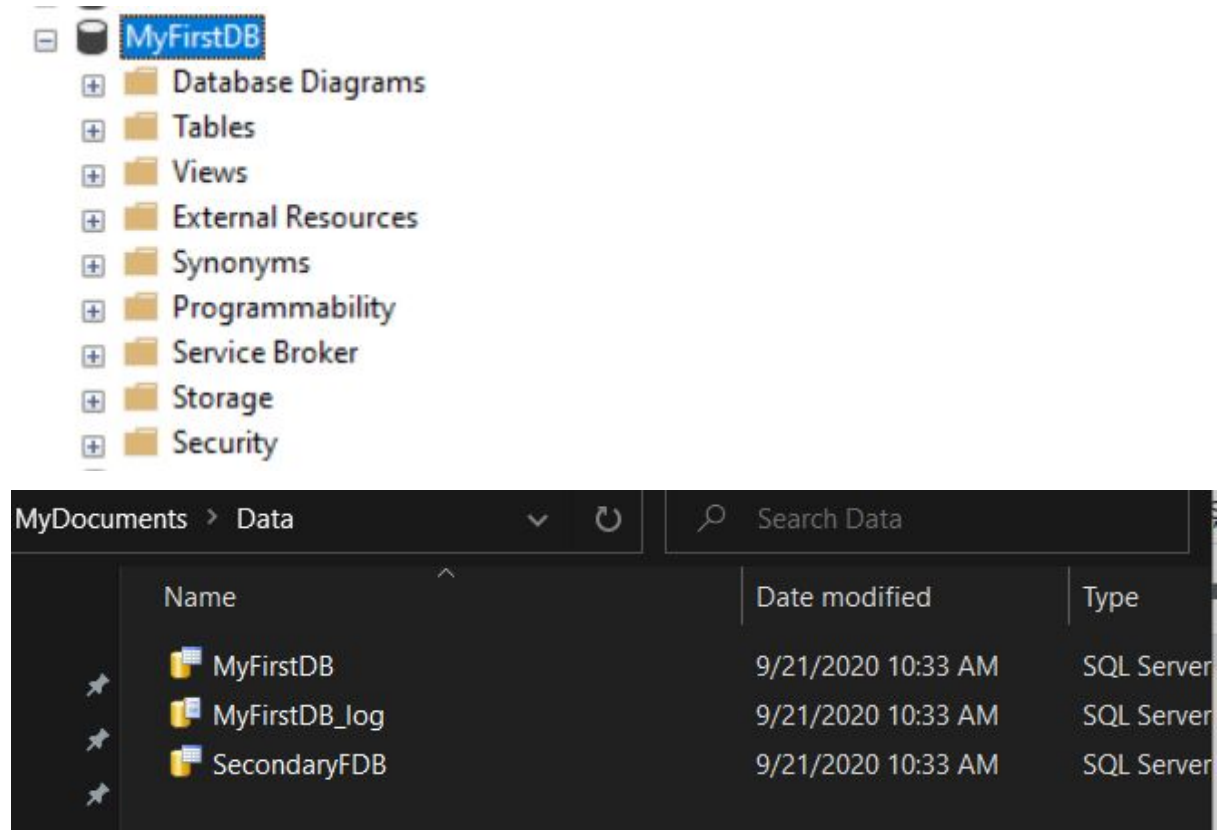
3. Create a maintenance plan for the database created in the first task. The unused space should be shrunk when it reaches 2000MB. The freed space should be returned to the OS. This plan should be executed every Friday at 12 AM. The report should be saved in **MyDocuments/SQL_event_logs** folder. Initialize the maintenance plan, verify the results in the log file.

4. Create a maintenance plan for the database created in the second task. It should be called "**Reconstruire Index**". In this plan, the system must accomplish the rebuilding of indices of the tables only (excluding the views). The free space on the page should be 10%. The sorting of indices should be realized in **tempdb**. After rebuilding, the complete statistics should be collected about the rebuilt indices. The third step of the plan should be the task of erasing the history of the Backup-Restore operations that had taken place in the SQL Server. All the history that is older than 6 weeks should be deleted. This plan should be executed monthly, on the first Sunday. Create the **MyDocuments/SQL_event_logs** folder. The execution report should be placed there and the maintenance process should be logged extensively. Initialize the maintenance plan, verify the results in the log file.

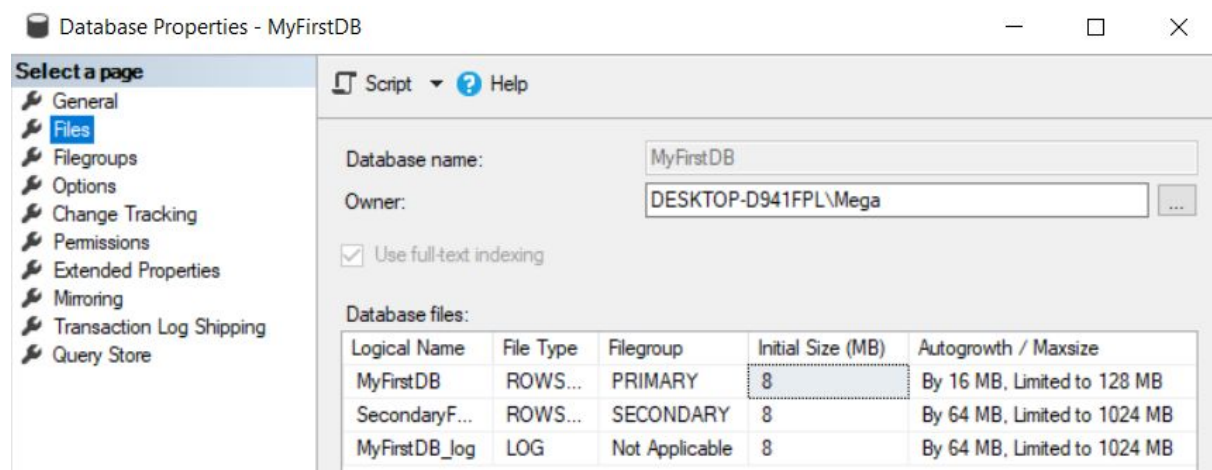
Implementation:

Task 1:

Create a database in the **MyDocuments/Data** folder



Set the properties: the growth of the primary file in 16MB with limit to 128MB and of the log file with growth of 64MB limited to 1024MB. The secondary files should be defined in a new filegroup and with the growth of 64MB limited to 1024MB.



Task 2:

Create a database with the log file located in **MyDocuments/Log** and to be accessible to only one user at a specific time.

▼ State	
Database Read-Only	False
Database State	NORMAL
Encryption Enabled	False
Restrict Access	SINGLE_USER ▼

Task 3:

Create a maintenance plan for the database created in the first DB with the parameters with unused space should be shrinked when it reaches 2000MB.

Shrink Database Task

Connection: Local server connection New...

Database(s): Specific databases ▼

Shrink database when it grows beyond: 2000 MB

Amount of free space to remain after shrink: 10 %

☐ Retain freed space in database files

☒ Return freed space to operating system

OK Cancel View T-SQL Help

Set the schedule:

New Job Schedule

Name: MaintenancePlan1.Subplan_1 Jobs in Schedule

Schedule type: Recurring ☒ Enabled

One-time occurrence

Date: 9/21/2020 Time: 10:54:54 AM

Frequency

Occurs: Weekly

Recurs every: 1 week(s) on

☐ Monday ☐ Wednesday ☒ Friday ☐ Saturday

☐ Tuesday ☐ Thursday ☐ Sunday

Daily frequency

☒ Occurs once at: 12:00:00 AM

☐ Occurs every: 1 hour(s)

Starting at: 12:00:00 AM

Ending at: 11:59:59 PM

Duration

Start date: 9/21/2020 ☐ End date: 9/21/2020 ☒ No end date:

Summary

Description: Occurs every week on Friday at 12:00:00 AM. Schedule will be used starting on 9/21/2020.

OK Cancel Help

Set the report file path:

Reporting and Logging

Reporting

The reporting options specified will be applied to all subplans within this maintenance plan.

☒ Generate a text file report

☒ Create a new file

Folder: D:\MyDocuments\SQL_event_logs ...

Run the Maintenance Plan:

Start Jobs - DESKTOP-D941FPL

	Success	2 Total	0 Error
		2 Success	0 Warning

Details:

Action	Status	Message
Start Job 'MaintenancePlan1.Sub...	Success	
Execute job 'MaintenancePlan1....	Success	

MaintenancePlan1_Subplan_1_20200921105848 - Notepad

File Edit Format View Help

Microsoft(R) Server Maintenance Utility (Unicode) Version 14.0.2027

Report was generated on "DESKTOP-D941FPL".

Maintenance Plan: MaintenancePlan1

Duration: 00:00:03

Status: Succeeded.

Details:

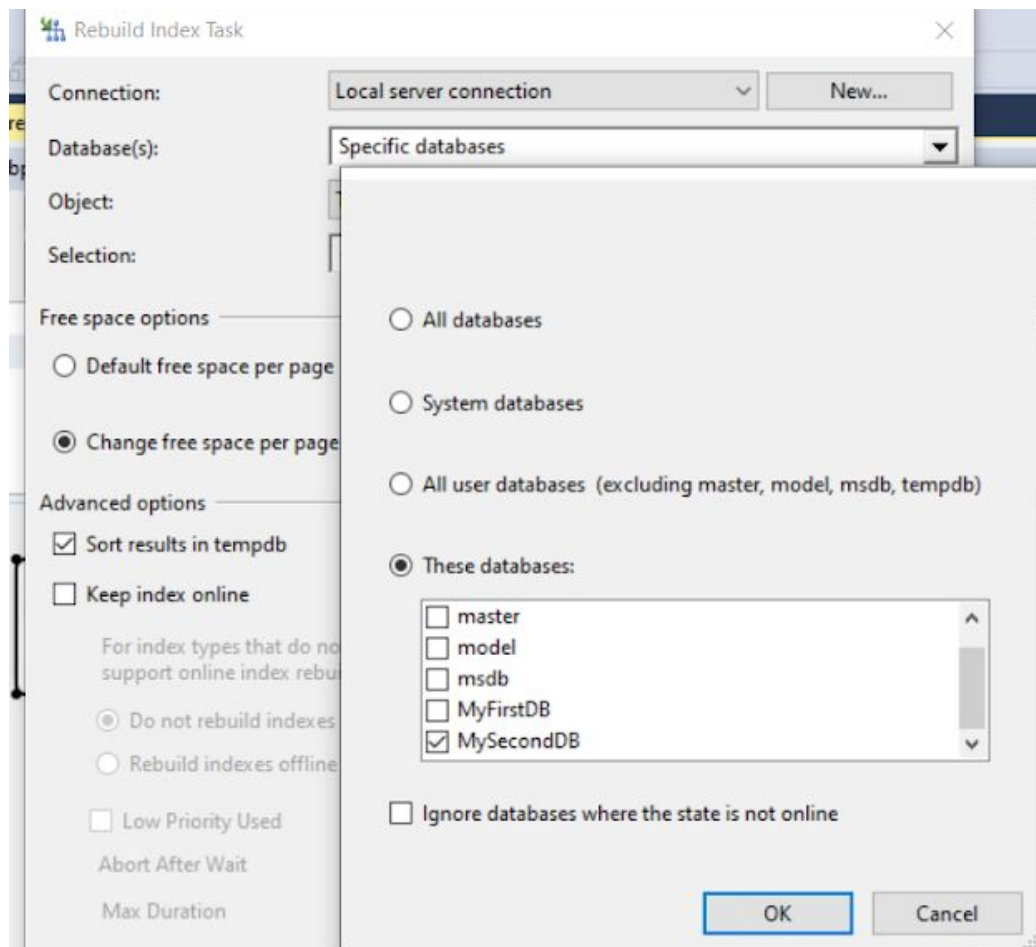
Task start: 2020-09-21T10:58:46.

Task end: 2020-09-21T10:58:46.

Success

Task 4:

Create a maintenance plan for the database created in the second task. It should be called "***Reconstruire Index***"



In the following step the sorting of indices should be realized in **tempdb**.

Rebuild Index Task

Connection: Local server connection New...

Database(s): Specific databases

Object: Table

Selection: <Select one or more>

Free space options

☐ Default free space per page

☒ Change free space per page to: 10 %

Advanced options

☒ Sort results in tempdb ☒ Pad Index

☐ Keep index online ☐ MAXDOP 1

For index types that do not support online index rebuilds

☒ Do not rebuild indexes

☐ Rebuild indexes offline

☐ Low Priority Used

Abort After Wait: None

Max Duration: 0 mins

Index Stats Options

Scan type: ☒ Fast ☐ Sampled ☐ Detailed

Optimize index only if:

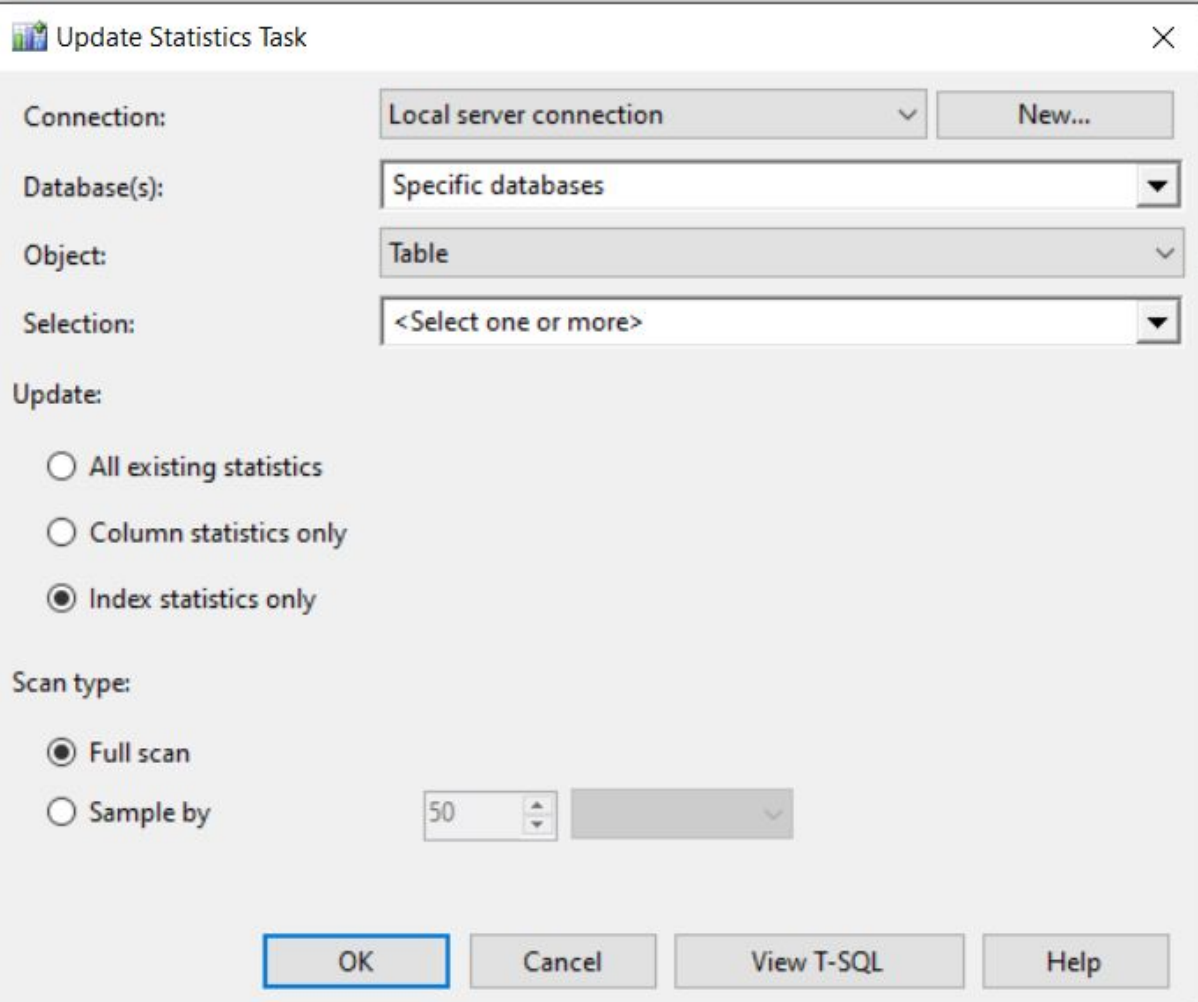
☒ Fragmentation > 30 %

☒ Page Count > 1000

☐ Used in last 7.00 days

OK Cancel View T-SQL Help

We configure the following task to collect statistics about the rebuild indexes.

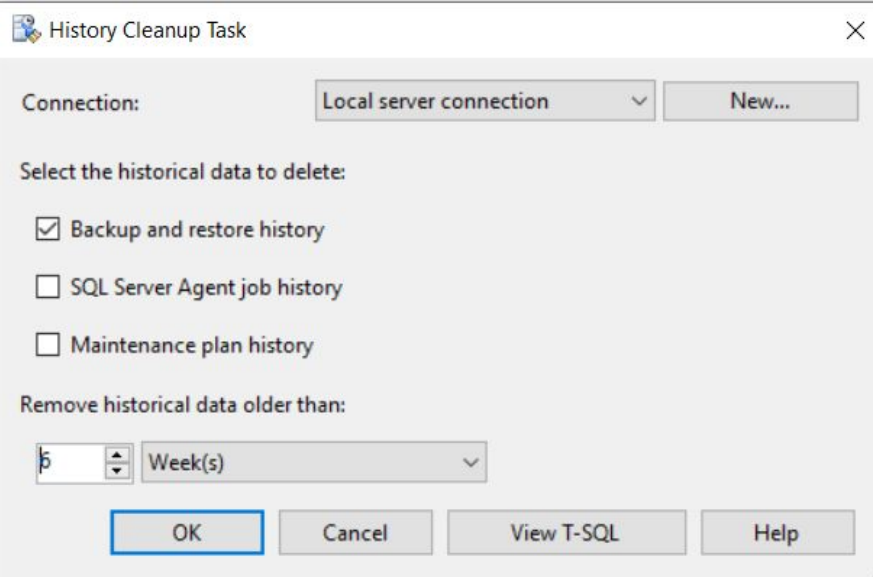


The 'Update Statistics Task' dialog box is shown with the following configuration:

- Connection:** Local server connection (dropdown) with a 'New...' button.
- Database(s):** Specific databases (dropdown).
- Object:** Table (dropdown).
- Selection:** <Select one or more> (dropdown).
- Update:**
 - ☐ All existing statistics
 - ☐ Column statistics only
 - ☒ Index statistics only
- Scan type:**
 - ☒ Full scan
 - ☐ Sample by: 50 (spin box) and a dropdown menu.

Buttons at the bottom: OK, Cancel, View T-SQL, and Help.

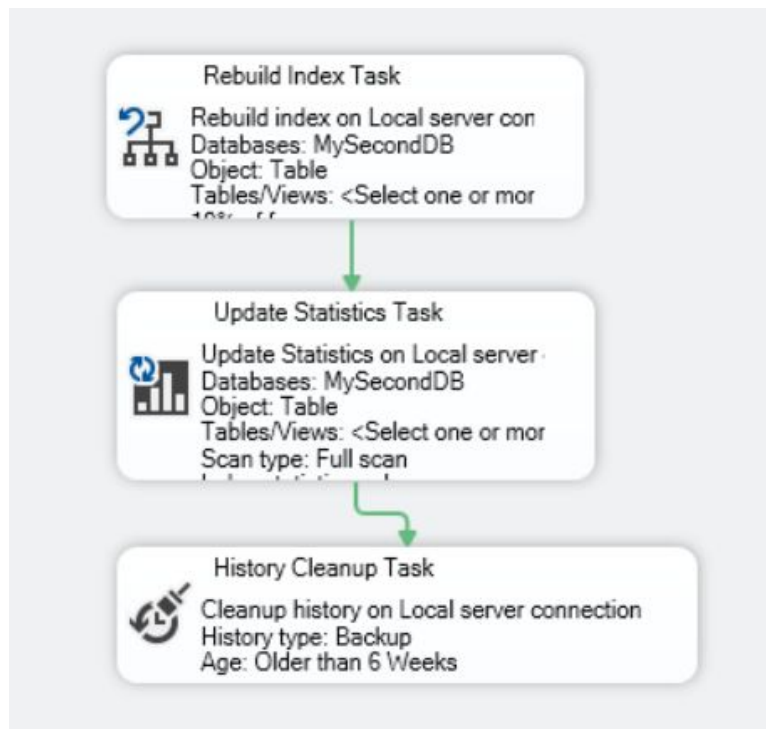
Clean up history after 6 weeks:



The 'History Cleanup Task' dialog box is shown with the following configuration:

- Connection:** Local server connection (dropdown) with a 'New...' button.
- Select the historical data to delete:**
 - ☒ Backup and restore history
 - ☐ SQL Server Agent job history
 - ☐ Maintenance plan history
- Remove historical data older than:**
 - 6 (spin box) and a dropdown menu set to 'Week(s)'.

Buttons at the bottom: OK, Cancel, View T-SQL, and Help.



We set the Schedule:

The screenshot shows the 'New Job Schedule' dialog box with the following configuration:

- Name:** Reconstruire index.Subplan_1
- Schedule type:** Recuring (dropdown), ☒ Enabled
- One-time occurrence:** Date: 9/21/2020, Time: 11:23:49 AM
- Frequency:**
 - Occurs:** Monthly (dropdown)
 - ☐ Day: 1 of every 1 month(s)
 - ☒ The: first Sunday of every 1 month(s)
- Daily frequency:**
 - ☒ Occurs once at: 12:00:00 AM
 - ☐ Occurs every: 1 hour(s)
 - Starting at: 12:00:00 AM, Ending at: 11:59:59 PM
- Duration:**
 - Start date: 9/21/2020
 - ☐ End date: 9/21/2020
 - ☒ No end date:
- Summary:**
Description: Occurs every first Sunday of every 1 month(s) at 12:00:00 AM. Schedule will be used starting on 9/21/2020.

Buttons: OK, Cancel, Help

Reporting and Logging

Reporting

The reporting options specified will be applied to all subplans within this maintenance plan.

☒ Generate a text file report

☒ Create a new file

Folder: ...

☐ Append to file

File name: ...

☐ Send report to an email recipient

SQL Server Agent must be configured to use Database Mail in order to send mail. The agent operators list contains only operators that have an email address defined.

Agent operator:

Logging

☒ Log extended information

☐ Log to remote server

Connection: New...

Report:

Reconstruire index_Subplan_1_20200921112611 - Notepad

File Edit Format View Help

Microsoft(R) Server Maintenance Utility (Unicode) Version 14.0.2027

Report was generated on "DESKTOP-D941FPL".

Maintenance Plan: Reconstruire index

Duration: 00:00:13

Status: Succeeded.

Details:

Rebuild index on Local server connection

Databases: MySecondDB

Object: Tables and views

10% of free space

Task start: 2020-09-21T11:25:59.

Task end: 2020-09-21T11:25:59.

Success

Command:

GO

Conclusion:

During this laboratory I learned how to create and configure databases. I became familiar with maintenance plans, how to create them either manually or via Maintenance Plan Wizard, how to configure tasks and how to set up the reports and execution times.