Data bases Laboratory Work Nr.1

Title: Creation and Maintenance of Database

Prerequisites: SQL Server 2019, SQL Server Management Studio

Objectives: Gather some basic skills and knowledge of data base creation and maintenance in MS SQL Server.

Tasks:

1. Creati o baza de date plasata fizic in mapa MyDocuments\Data, fixand o crestere a fisierului primar a bazei de 16MB cu limita de crestere de 128 MB si a log-ului de 64 MB cu limita de crestere de 1024 MB. Pentru fisierele secundare sa se defineasca un Filegroup nou implicit, setand cresterea fisierelor secundare de 64 MB cu limita de 1024 MB.

2. Creati o baza de date, unde fisierul log sa fie fizic plasat in mapa MyDocuments\Log, numele fisierului log in mediul sistemului de operare trebuie sa se deosebeasca de cel logic definit in schema fizica. Este important ca baza de date creata sa fie compatibila cu sistemul MS SQL Server 2017 si ea sa fie accesibila numai unui singur utilizator intr-un moment de timp.

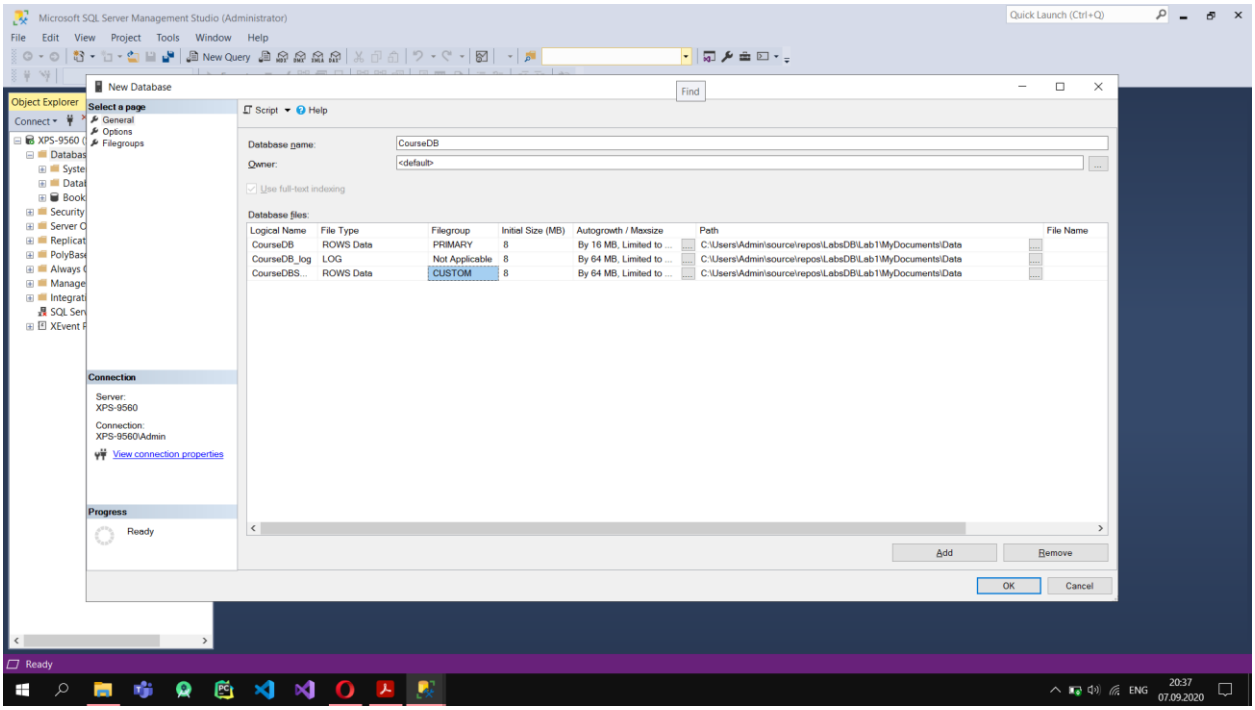
3. Creati planul de mtretinere a bazei de date, construita m sarcina 1. Spatiul neutilizat de fi~ierele bazei de date trebuie mdepartat atunci cand el atinge marimea 2000Mb. Spatiul eliberat trebuie sa fie returnat sistemului de operare. Aceasta operatiune trebuie sa ruleze m fiecare vineri, la ora 00:00. Raportul executarii planului de mtretinere trebuie salvat m docarul MyDocuments\SQL_event_logs. lnitializati executarea planului. Dupa executare, verificati rezultatele m fi~ierul log.

4. Creati planul de mtretinere a bazei de date, construite m exercitiul 2. Numele planului va fi: ,,Reconstruire index". in cadrul acestui plan, sistemul trebuie sa realizeze reconstruirea indec~ilor numai asupra tabelelor de baza (exclusiv viziunilor) din toate schemele care exista m baza de date m cauza. Spatiul liber pe pagina trebuie sa fie 10%. Sortarea indec~ilor trebuie sa se realizeze m tempdb. Dupa reconstruire, trebuie sa urmeze colectarea statisticilor complete despre indec~ii reconstruiti. Al treilea pas al planului trebuie sa constituie sarcina de ~tergere a istoriei despre operatiile de Backup-Restore ce au avut Joe pe SQL Server. Trebuie ~ters istoricul care este mai vechi de 6 saptamani. Acest plan trebuie sa fie executat In fiecare prima duminica a lunii. Creati dosarul MyDocuments\SQL_reports. Raportul de executare a planului trebuie sa fie adaugat m acest fi~ier. Procesul de mentenanta - sa fie logat m mod extended. lnitializati executarea planului. Dupa executare, verificati rezultatele m fi~ierul log generat.

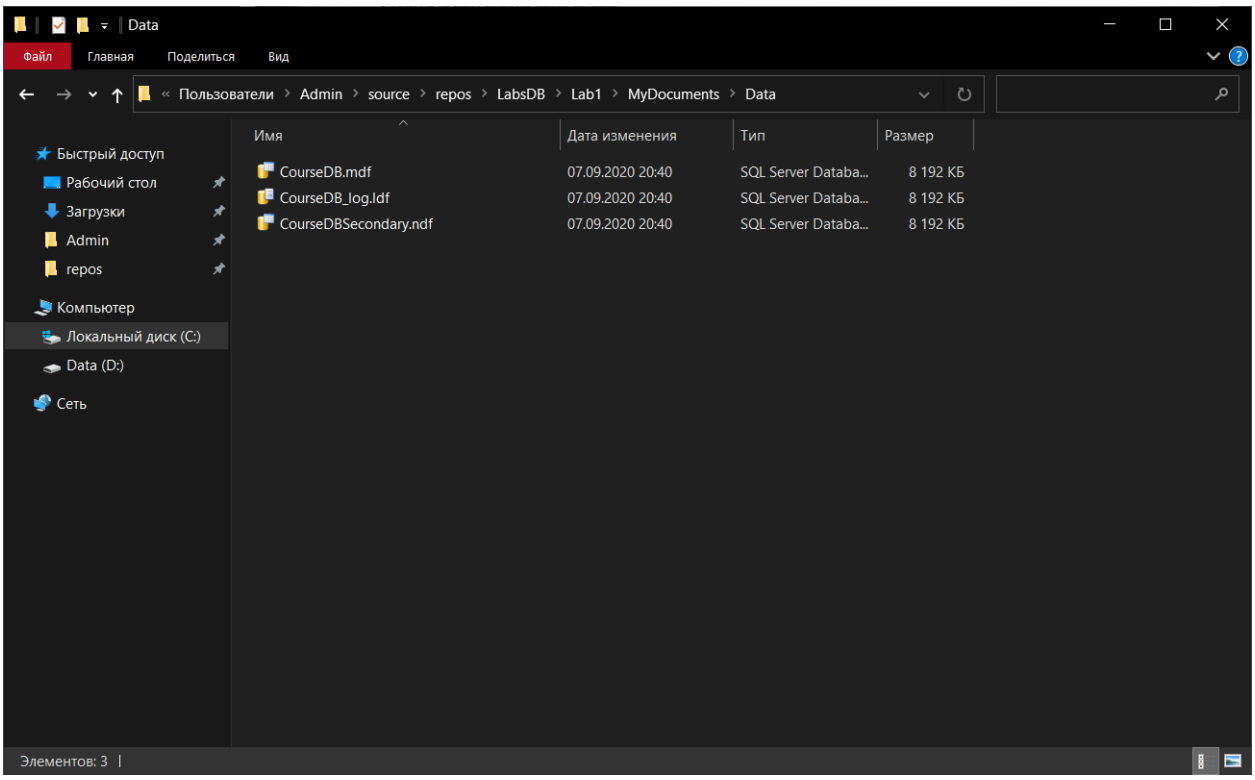
Implementation:

1.

Firstly, while creating the database I changed growth size and maximal size of files. Then, I changed their location. At the next step I added new file and created a new filegroup for it (set this new filegroup as default):

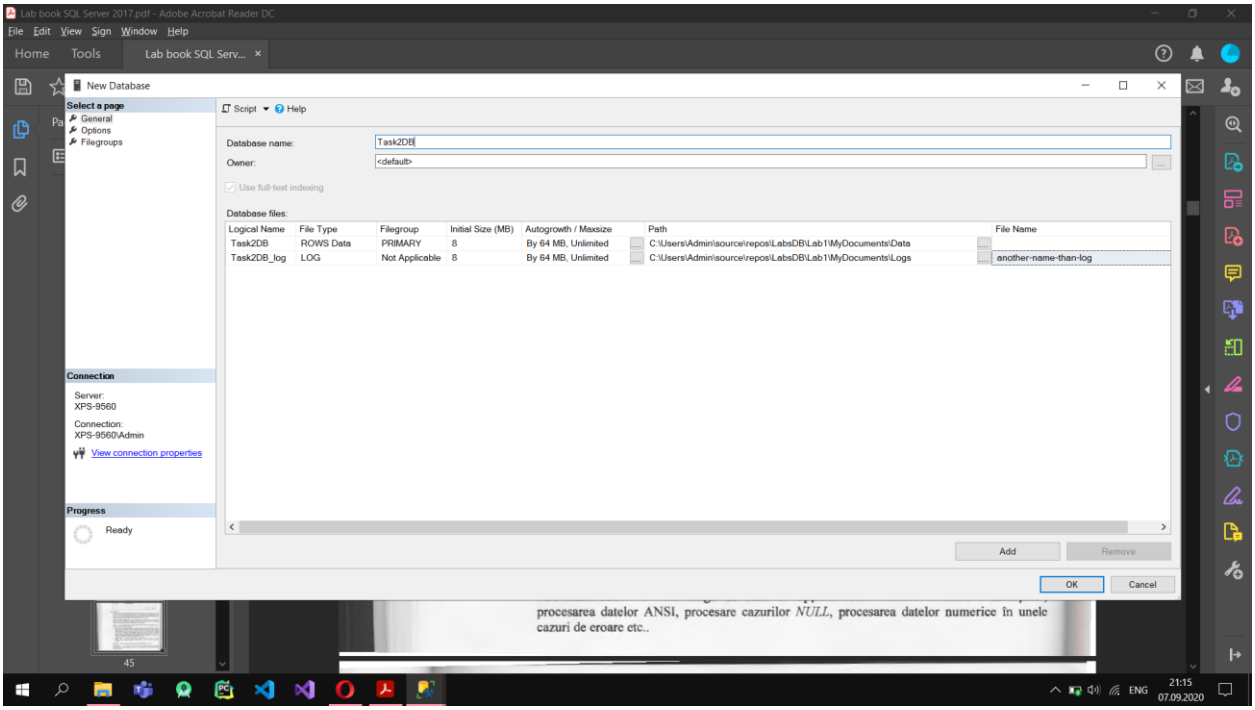


Finally, I got the following results:

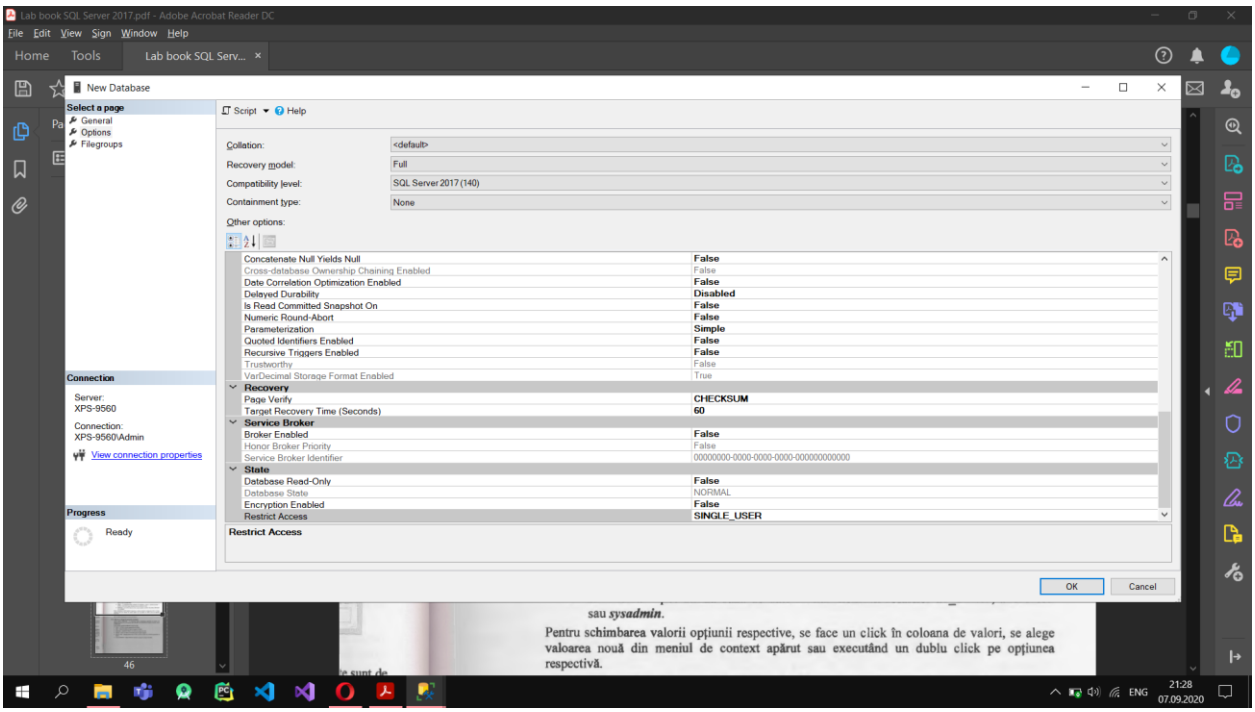


2.

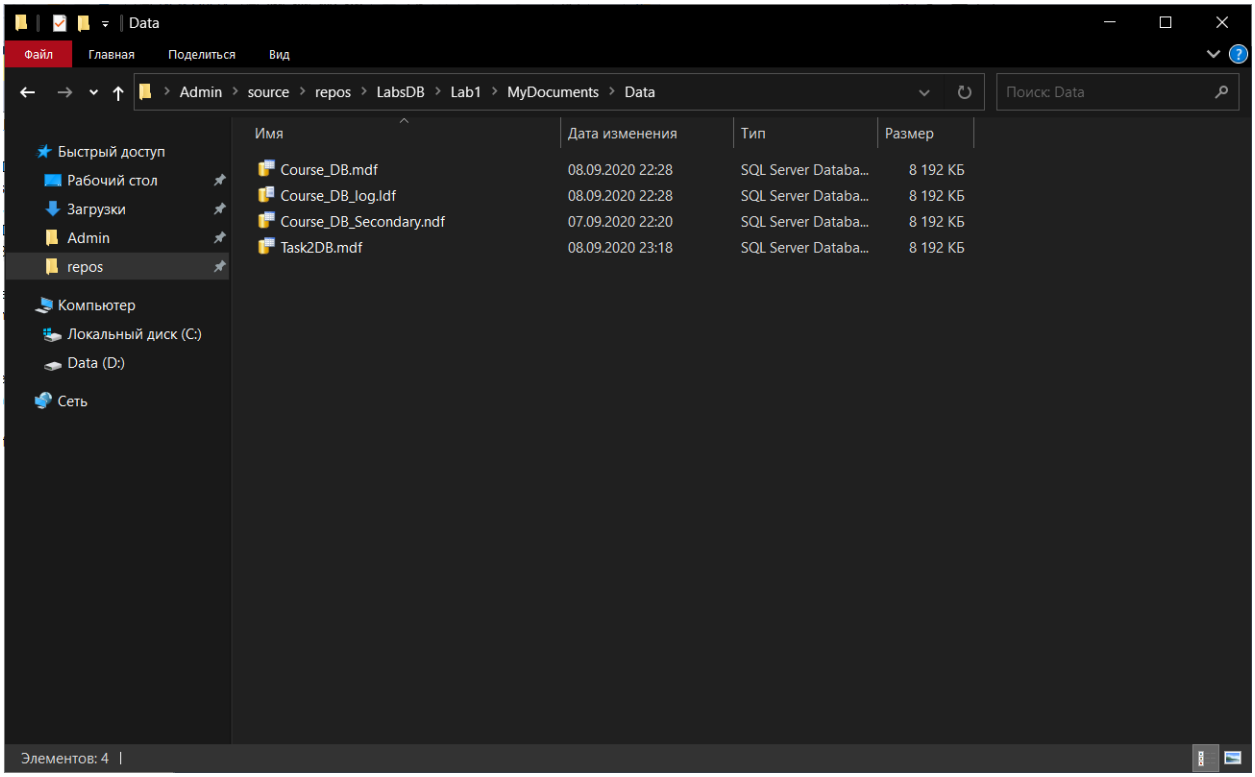
In “New Database” window I changed file’s paths and changed “File Name” of log file:

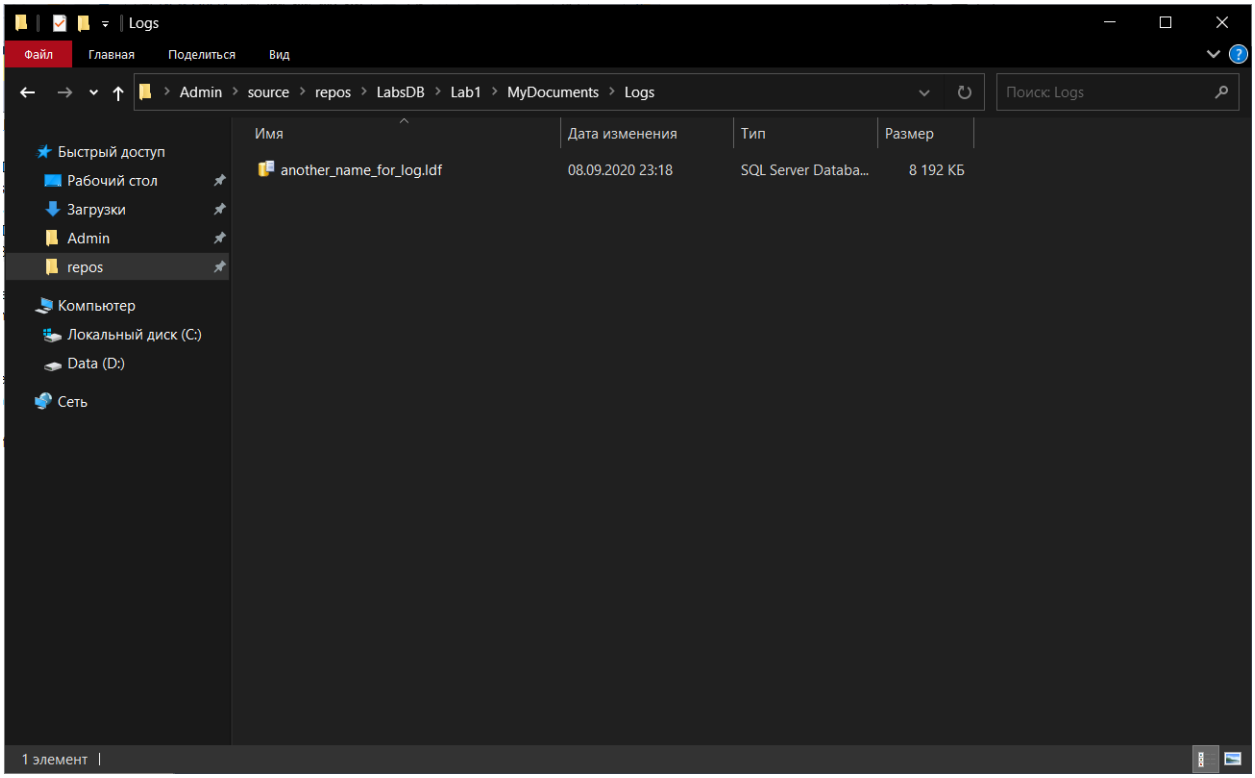


Then I set compatibility level to SQL Server 2017 and changed Restrict Access to SINGE_USER:



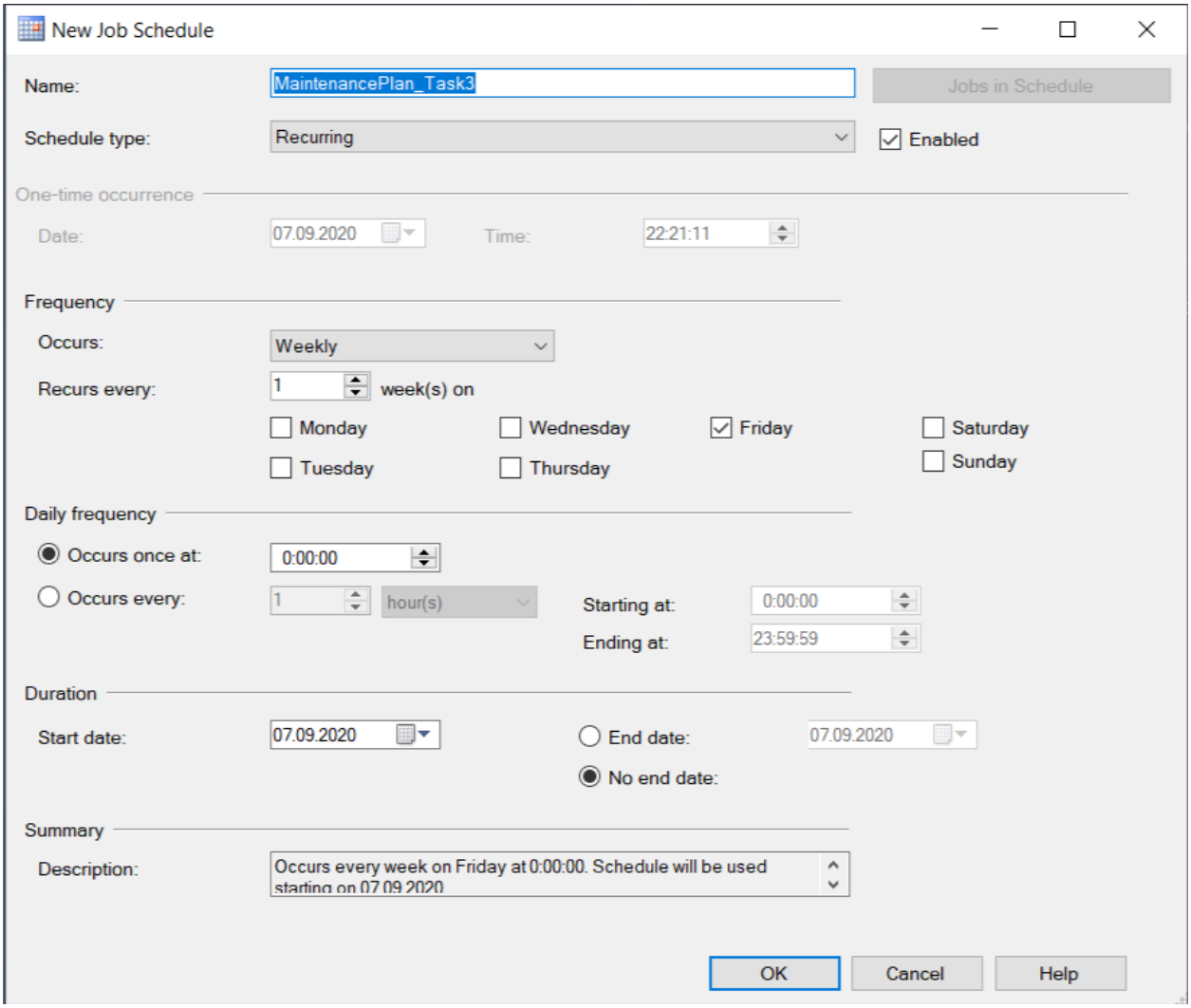
Results:



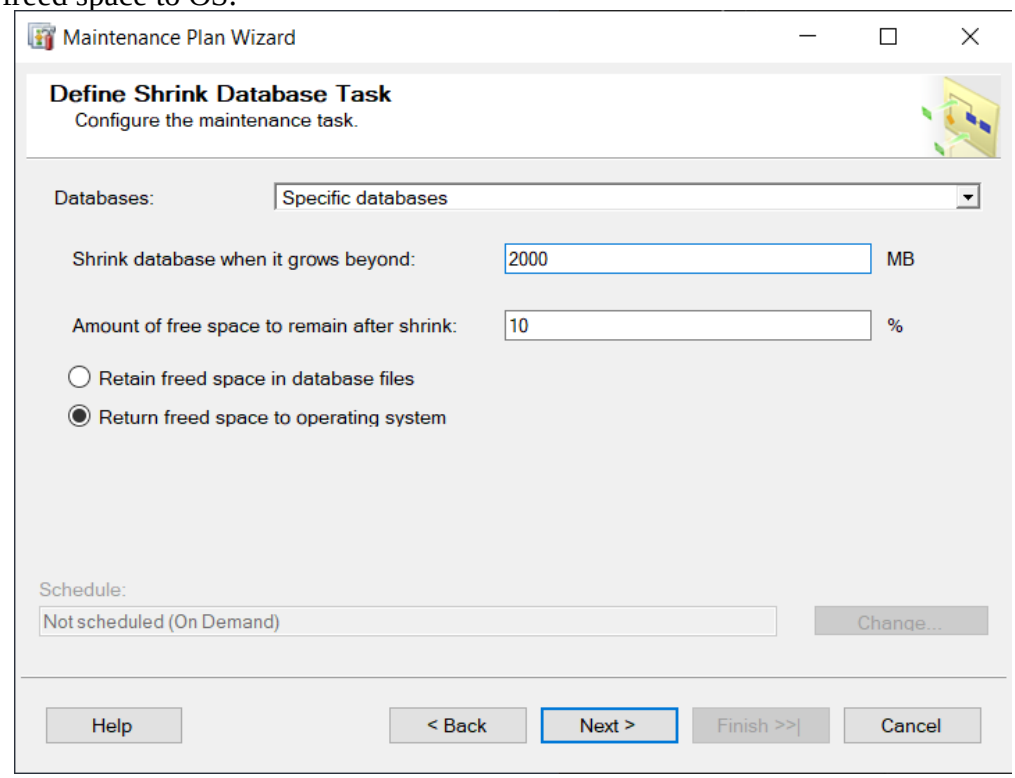


3.

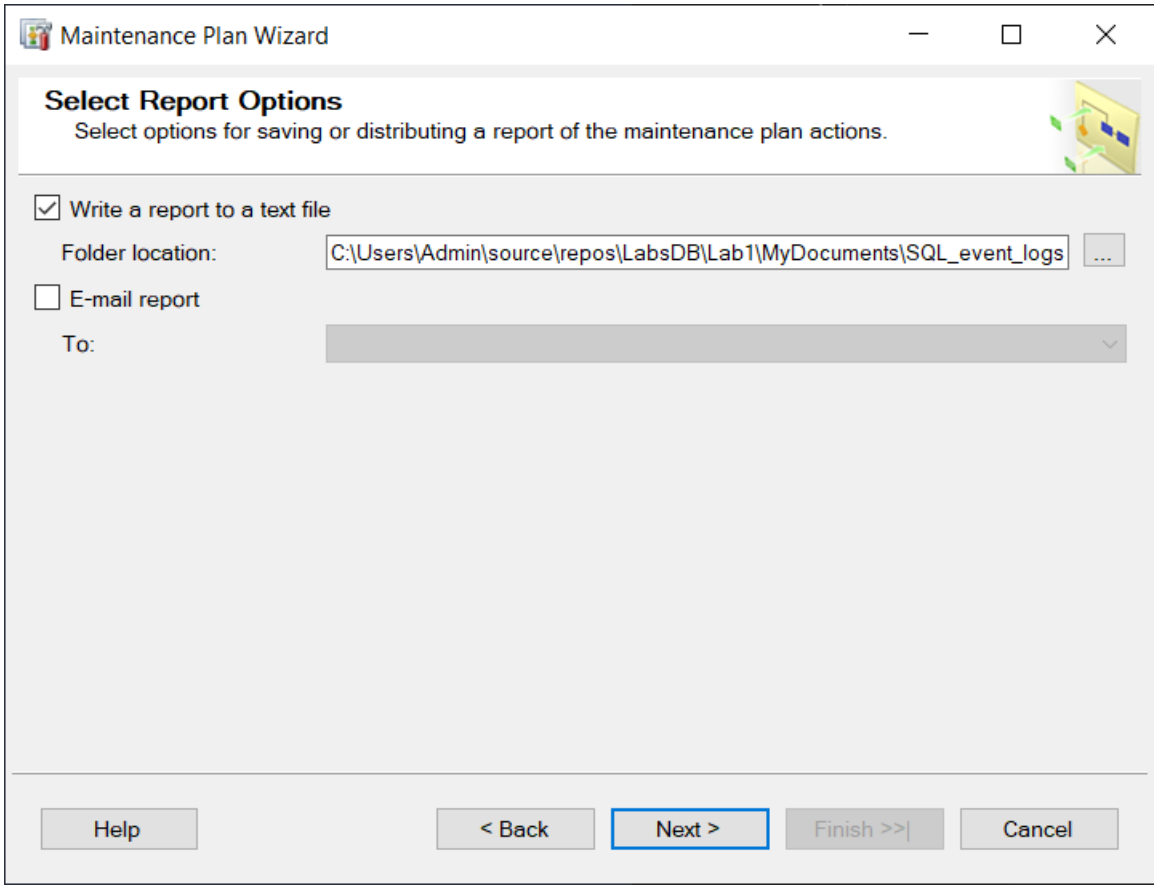
First step in maintenance plan wizard was settings the time for plan to execute (every Friday at 0:00:00):



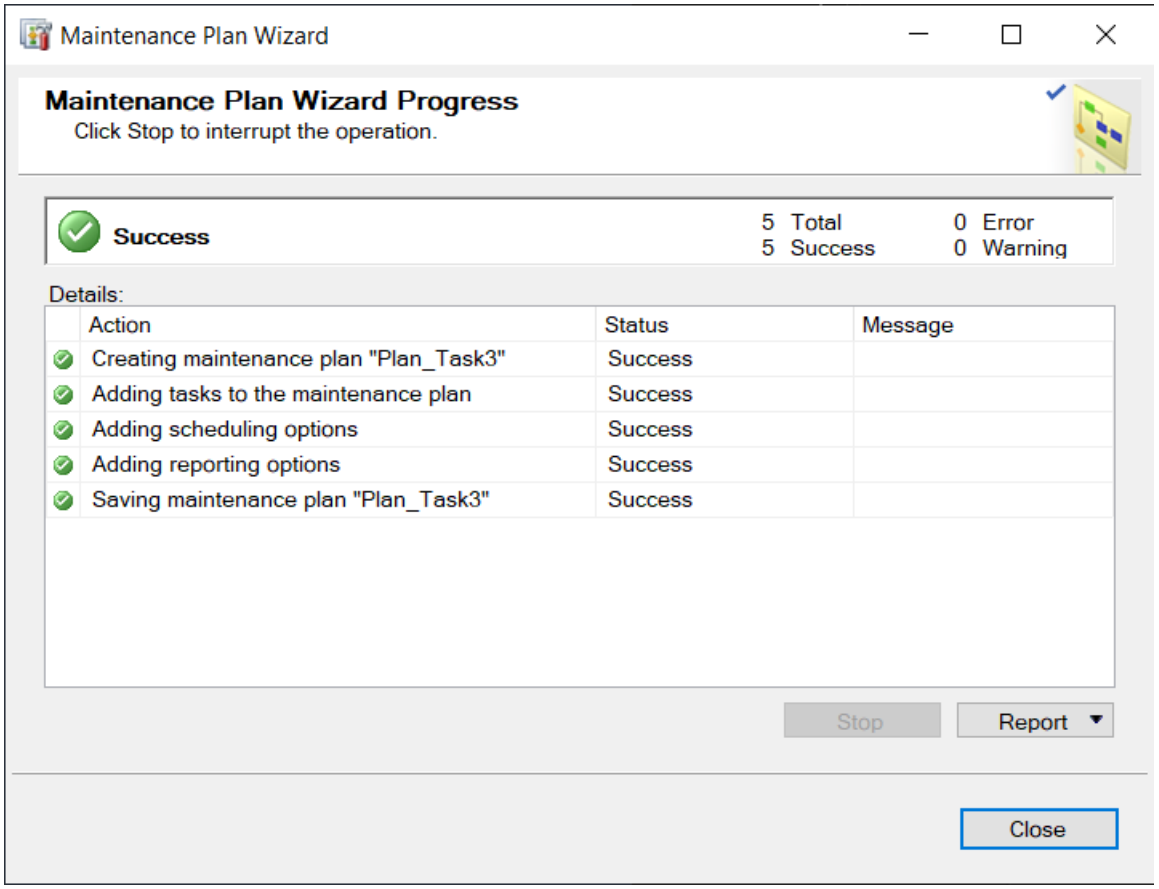
Next was adding one step (Shrink database) and setting up this step: shrink DB when it grows beyond 2000 mb and return freed space to OS:

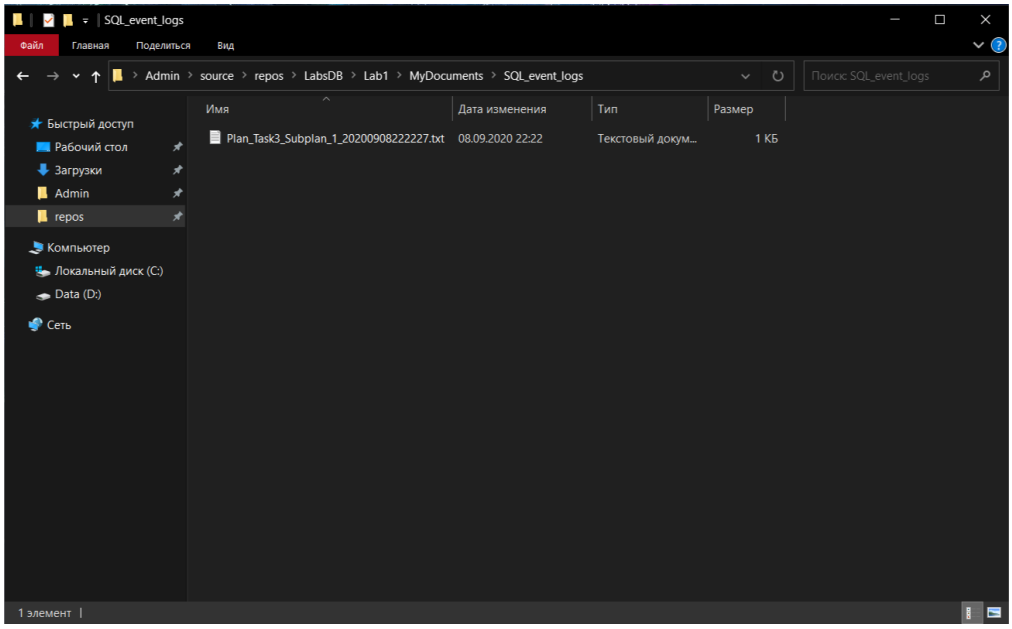


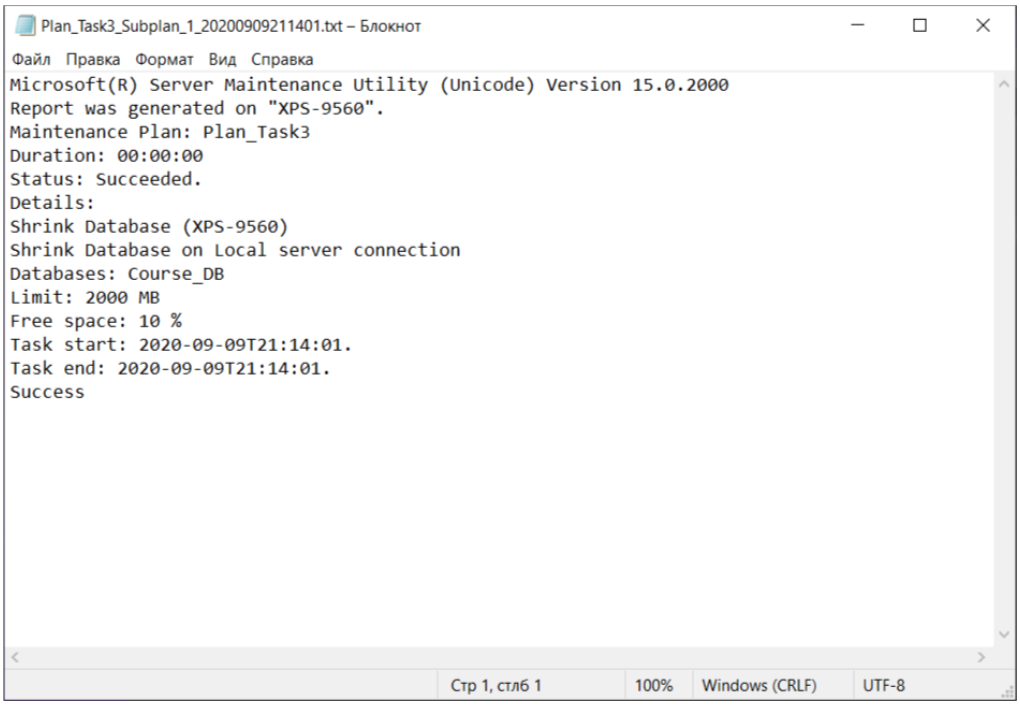
Set up location of text report:


Maintenance Plan Wizard
Select Report Options
Select options for saving or distributing a report of the maintenance plan actions.
Write a report to a text file
Folder location:
C:\Users\Admin\source\repos\LabsDB\Lab1\MyDocuments\SQL_event_logs
...
E-mail report
To:
Help
< Back
Next >
Finish >>|
Cancel

Results:

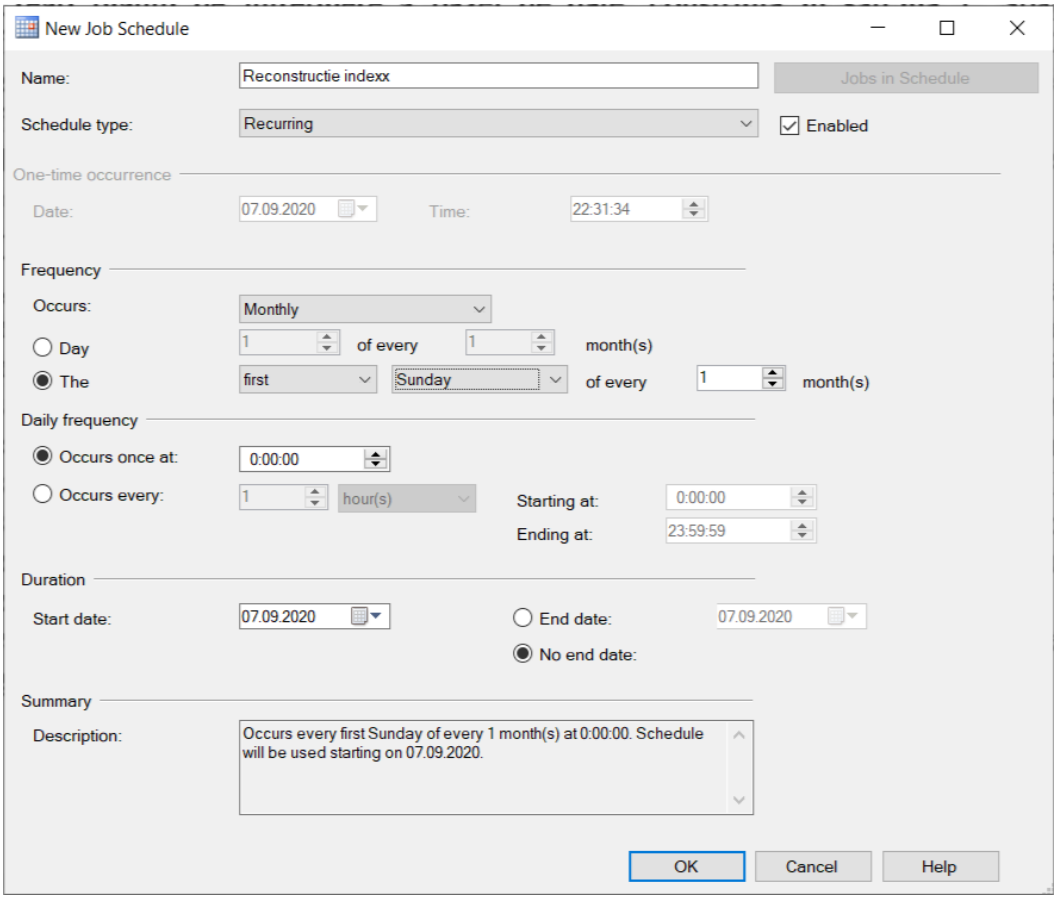

Maintenance Plan Wizard
Maintenance Plan Wizard Progress
Click Stop to interrupt the operation.
Success
5 Total
5 Success
0 Error
0 Warning
Details:
Action
Status
Message
Creating maintenance plan "Plan_Task3"
Success
Adding tasks to the maintenance plan
Success
Adding scheduling options
Success
Adding reporting options
Success
Saving maintenance plan "Plan_Task3"
Success
Stop
Report
Close



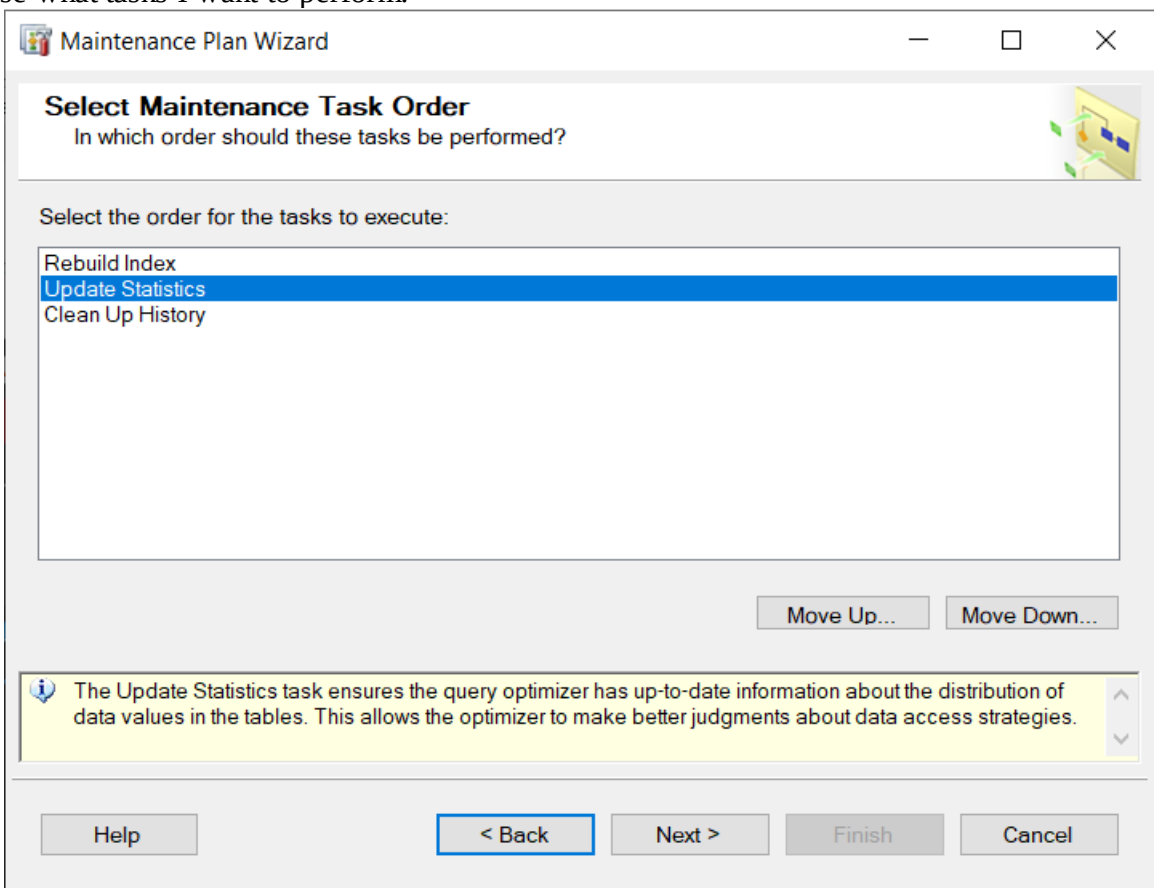


4.

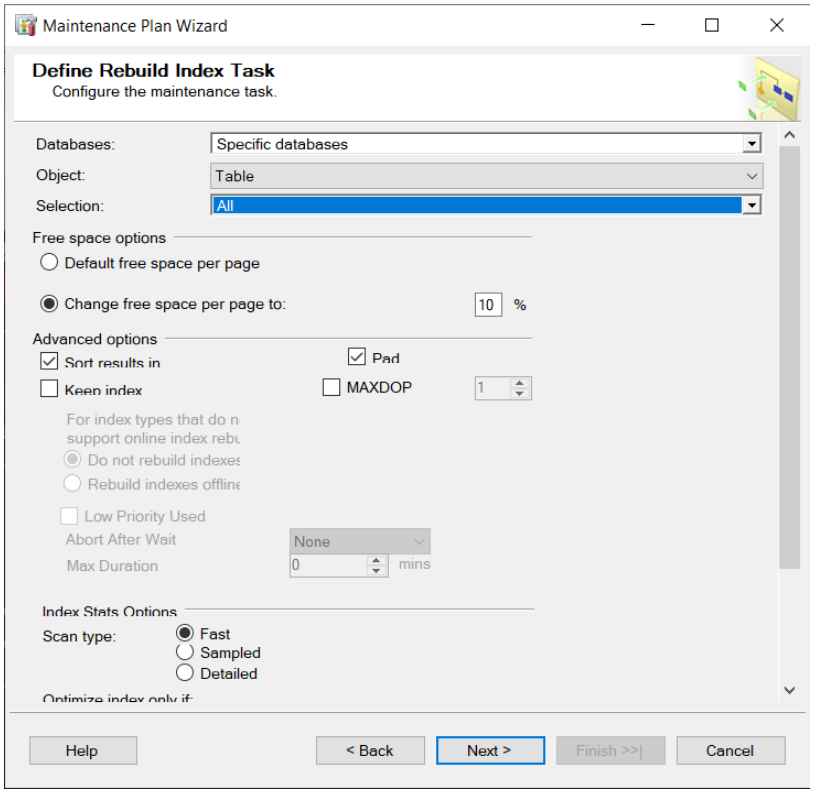
Set up time for following maintenance plan:

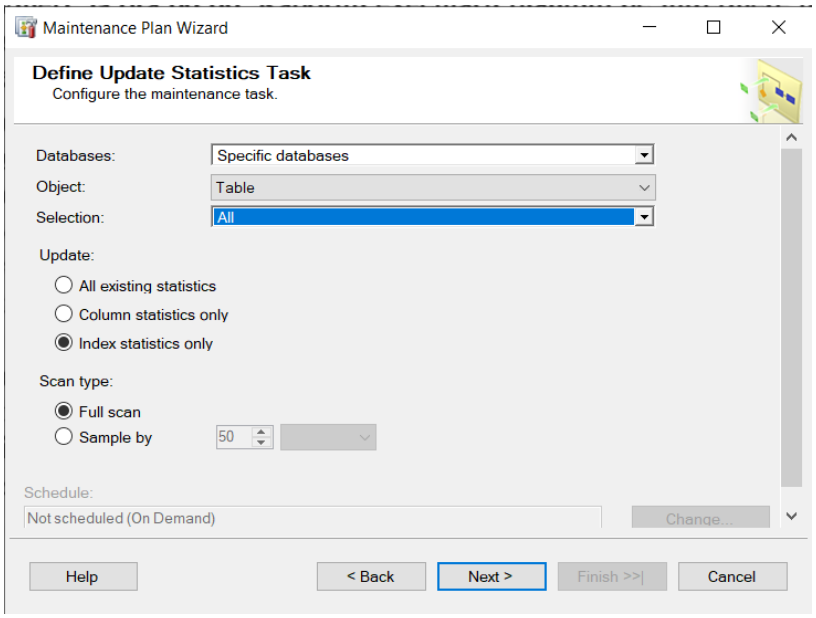


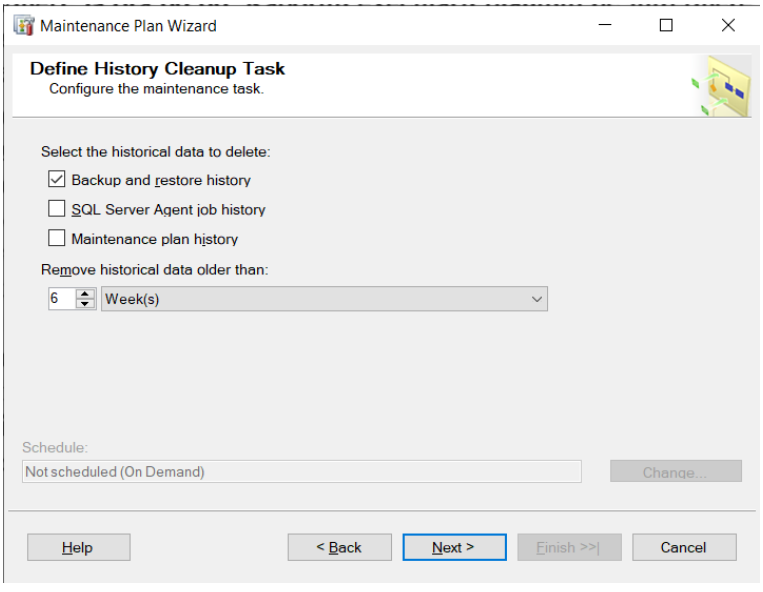
Then chose what tasks I want to perform:



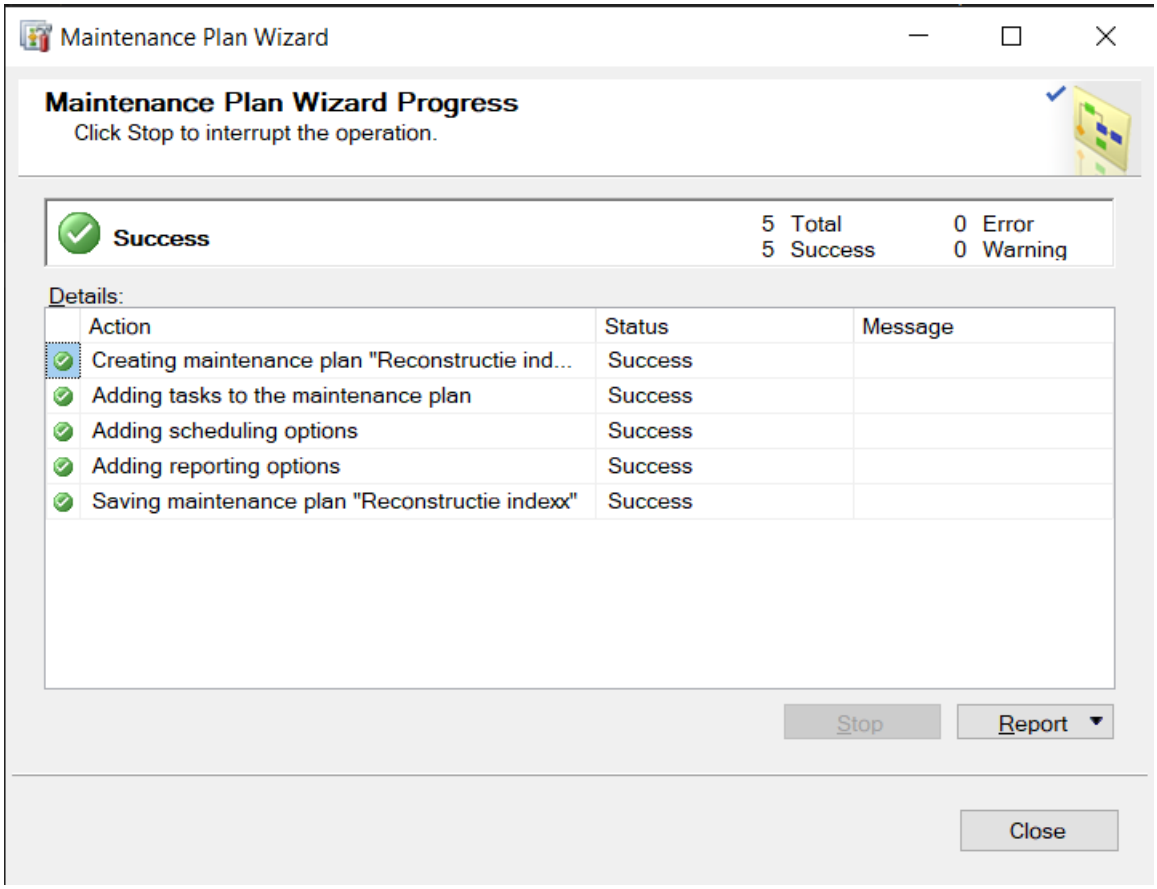
Setting up these tasks according to requirements:

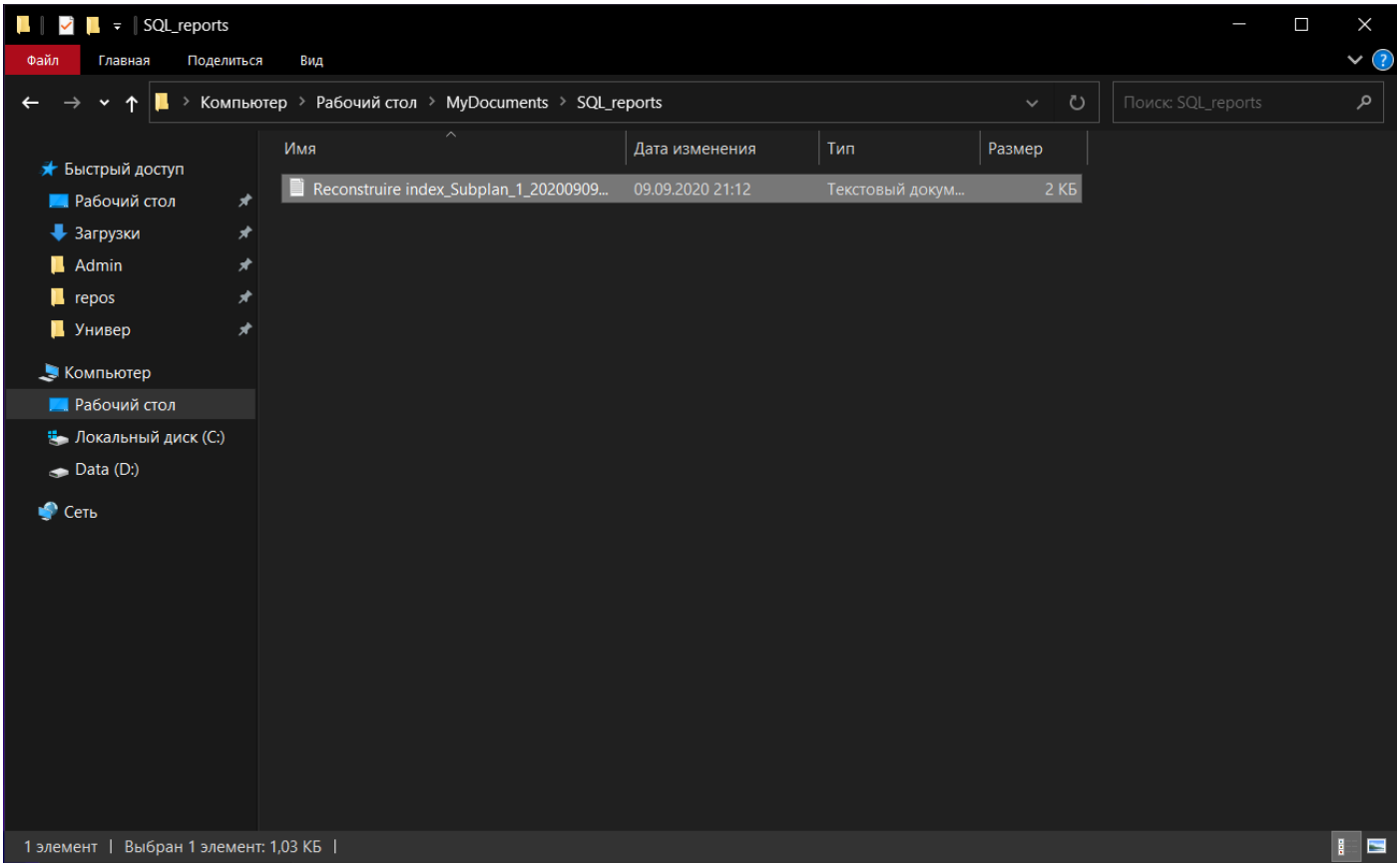

Maintenance Plan Wizard
Define Rebuild Index Task
Configure the maintenance task.
Databases:
Specific databases
Object:
Table
Selection:
All
Free space options
Default free space per page
Change free space per page to:
10
%
Advanced options
Sort results in
Pad
Keep index
MAXDOP
1
For index types that do n
support online index rebu
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:
Help
< Back
Next >
Finish >>|
Cancel

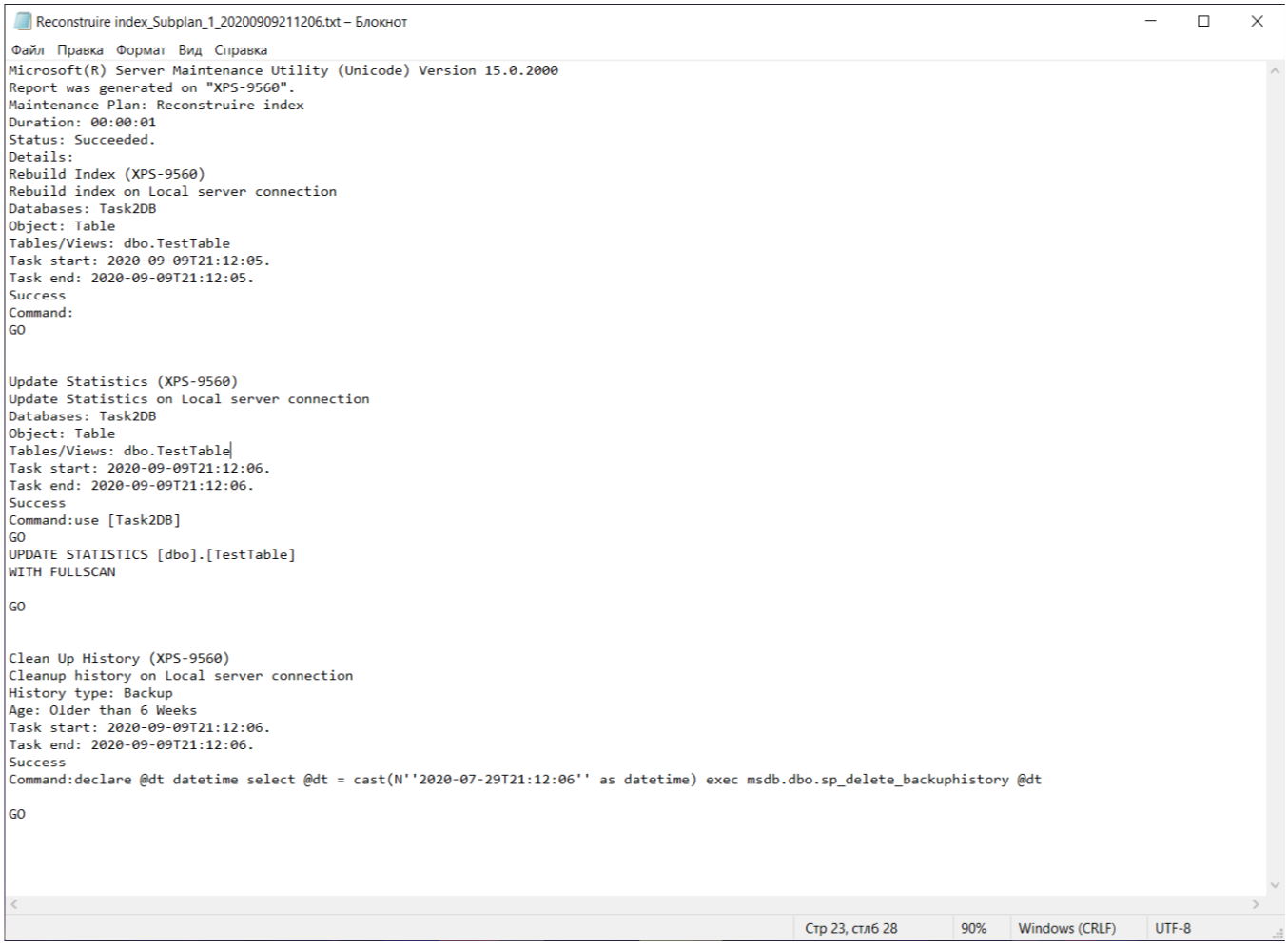

Maintenance Plan Wizard
Define Update Statistics Task
Configure the maintenance task.
Databases:
Specific databases
Object:
Table
Selection:
All
Update:
All existing statistics
Column statistics only
Index statistics only
Scan type:
Full scan
Sample by
50
Schedule:
Not scheduled (On Demand)
Change...
Help
< Back
Next >
Finish >>|
Cancel


Maintenance Plan Wizard
Define History Cleanup Task
Configure the maintenance task.
Select the historical data to delete:
Backup and restore history
SQL Server Agent job history
Maintenance plan history
Remove historical data older than:
6
Week(s)
Schedule:
Not scheduled (On Demand)
Change...
Help
< Back
Next >
Finish >>|
Cancel

Obtained results:







Conclusion

During this laboratory work I gained knowledge and practical experience on creating database in SQL Server, with custom files, filegroups and different options. Also, I got experience on creating custom maintenance plans for DB's. Another important facts which I learned are: how is database saved in filesystem and what's the difference between .mdf, .ndf and .ldf files; how is database structured and operated by RDBMS; how should databases be created, what is their purpose and what techniques can be used to maintain them.