# SQL Databases Development Environment

## Setting up a docker based development environment enabling various SQL database servers.

# Table of content

# Introduction

In this document I describe how to setup a modern development using Docker containers that runs the various databases.  Virtualization using Docker containers is today a popular way to provide services, for example microservices database services, that are easily deployed and scalable. Although, Docker and containers are beyond the scope of the SQL database course, using them to run the database servers, instead of making hard server installations on your computer, is a good introduction to a modern server architecture.

We will also install a couple of popular and powerful Database management tools, two open-source tools, Azure Data Studio and DBeaver.

We will move on to installing some demo databases, i.e., the sakila database, from MySQL, that I will follow sakila in my theory lessons.

Finally, I will give instructions how to install Entity Framework Core, which is a popular ORM (Object Relational Mapping) tool used to create and access SQL databases from .NET and C#. We will be using this tool in lesson 7, for you to explore the difference between C# and SQL capabilities in terms of databases.

# Github repositories

https://github.com/SEIDOAB-SQL/Music.git
https://github.com/SEIDOAB-SQL/MusicModel.git
https://github.com/SEIDOAB-SQL/GoodFriends.git
https://github.com/SEIDOAB-SQL/GoodFriendsModel.git
https://github.com/SEIDOAB-SQL/CustomerOrderModel.git

https://github.com/SEIDOAB-SQL/SQLDB_sql.git

# SQL Server 2022 Docker container installation (macOS Mx)

## 1. Needed commands.

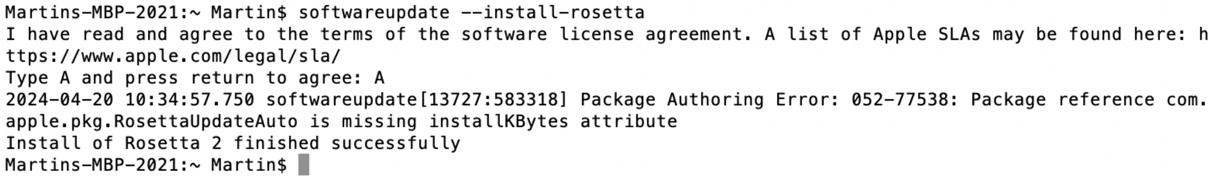
In my repository I list the commands needed. Below you can copy one-by-one following the steps.
https://github.com/SEIDOAB-SQL/SQLDB_sql/blob/main/docker/create_sqlserver2022_docker.sh

## 2. Ensure Rosetta2 is installed on your M1 or M2 machine to emulate x86

Use repo-command marked
#Only on macOS ensure rosetta2 is installed on your M1 or M2 machine to emulate x86

In terminal type:
softwareupdate --install-rosetta

it will look something like:



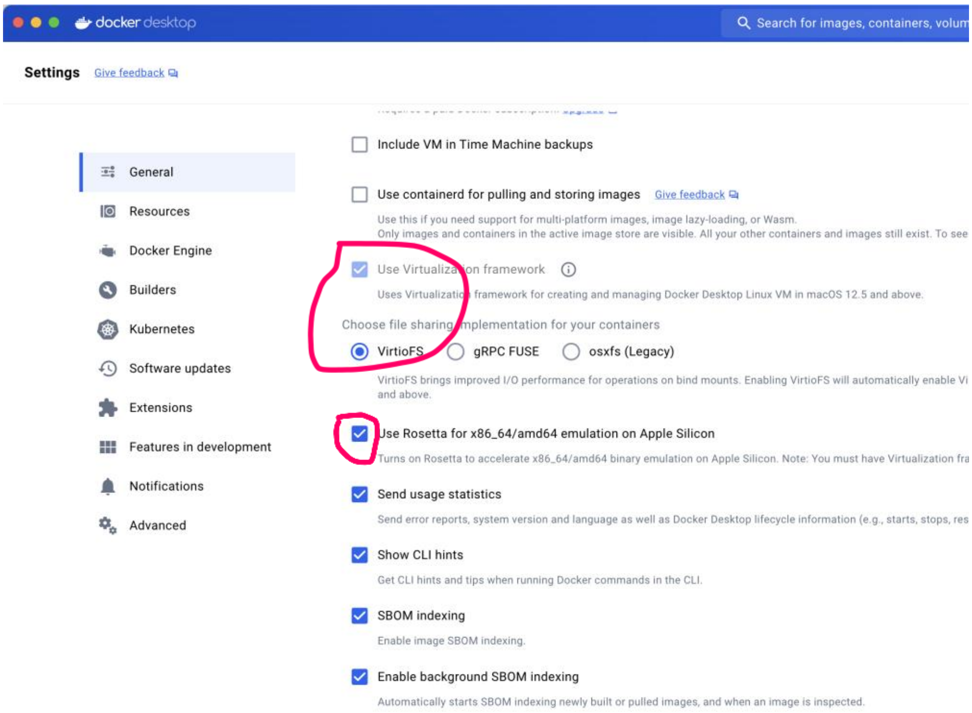
```
Martins-MBP-2021:~ Martin$ softwareupdate --install-rosetta
I have read and agree to the terms of the software license agreement. A list of Apple SLAs may be found here: h
ttps://www.apple.com/legal/sla/
Type A and press return to agree: A
2024-04-20 10:34:57.750 softwareupdate[13727:583318] Package Authoring Error: 052-77538: Package reference com.
apple.pkg.RosettaUpdateAuto is missing installKBytes attribute
Install of Rosetta 2 finished successfully
Martins-MBP-2021:~ Martin$ 
```

## 3. Download and install Docker Desktop

https://www.docker.com/products/docker-desktop/

## 4. Start Docker Desktop, Go to Settings

Under General:
ensure “Use Virtualization framework” is set.
ensure “Use Rosetta for x86/amd64 emulation on Apple silicon” is set.



□ Include VM in Time Machine backups

□ Use containerd for pulling and storing images Give feedback

Use this if you need support for multi-platform images, image lazy-loading, or Wasm.
Only images and containers in the active image store are visible. All your other containers and images still exist. To see

☑ Use Virtualization framework

Uses Virtualization framework for creating and managing Docker Desktop Linux VM in macOS 12.5 and above.

Choose file sharing implementation for your containers

● VirtioFS ○ gRPC FUSE ○ osxfs (Legacy)

VirtioFS brings improved I/O performance for operations on bind mounts. Enabling VirtioFS will automatically enable Vi
and above.

☑ Use Rosetta for x86_64/amd64 emulation on Apple Silicon

Turns on Rosetta to accelerate x86_64/amd64 binary emulation on Apple Silicon. Note: You must have Virtualization fra

☑ Send usage statistics

Send error reports, system version and language as well as Docker Desktop lifecycle information (e.g., starts, stops, res

☑ Show CLI hints

Get CLI hints and tips when running Docker commands in the CLI.

☑ SBOM indexing

Enable image SBOM indexing.

☑ Enable background SBOM indexing

Automatically starts SBOM indexing newly built or pulled images, and when an image is inspected.

## 5. Pull the SQLServer container

Use repo-command marked
#pull the container image to my computer

In terminal type:

```
docker pull mcr.microsoft.com/mssql/server:2022-latest
```

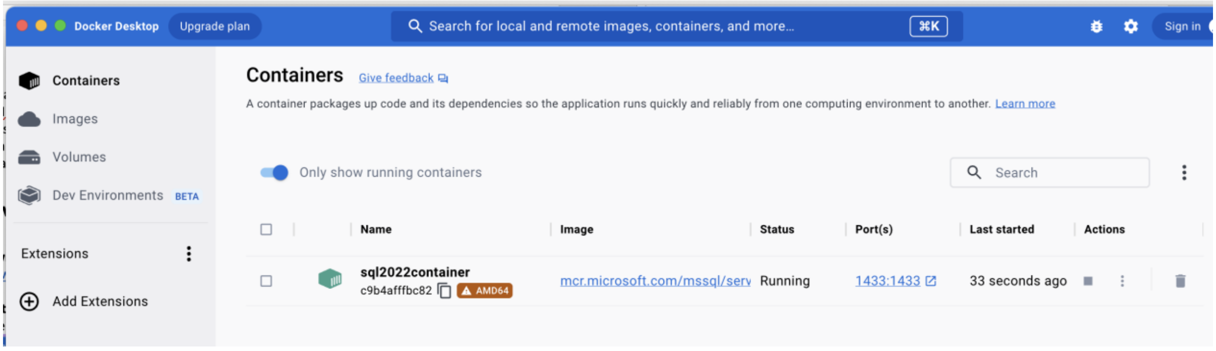
## 6. Install and run the container

Use repo-command marked
#install and run the container

In terminal type:

```
docker run -e "ACCEPT_EULA=Y" -e "MSSQL_SA_PASSWORD=skYhgS@83#aQ" -p
14333:1433 --name sql2022container1 --hostname sql2022 -d
mcr.microsoft.com/mssql/server:2022-latest
```

Now your Docker Desktop should look something as below. You can start and stop the sql2022container by clicking on the Actions icon.



Containers

A container packages up code and its dependencies so the application runs quickly and reliably from one computing environment to another. Learn more

| □ | Name | Image | Status | Port(s) | Last started | Actions |
|---|---|---|---|---|---|---|
| □ | sql2022container<br>c9b4afffbc82 AMD64 | mcr.microsoft.com/mssql/serv | Running | 1433:1433 | 33 seconds ago | ■ ⋮ |

# Database tools installation on macOS (Mx)

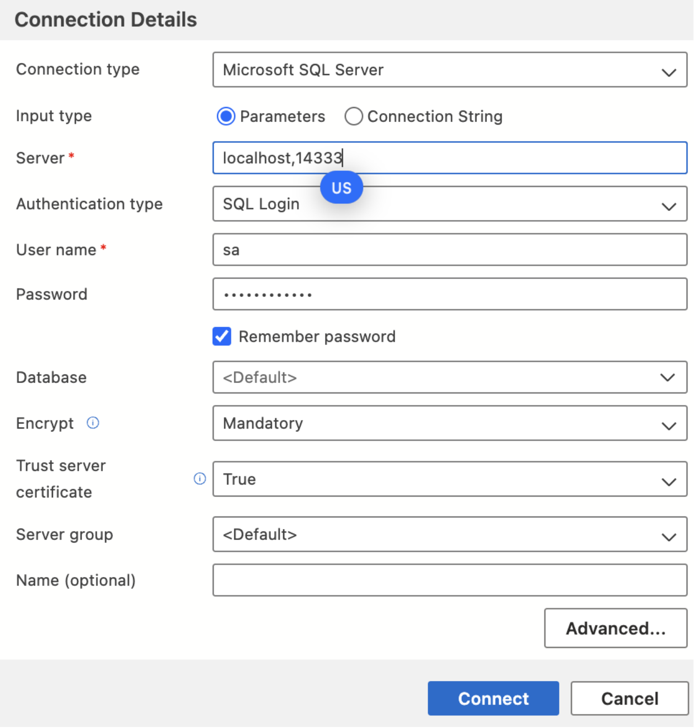
## Azure Data Studio

https://learn.microsoft.com/en-us/azure-data-studio/download-azure-data-studio?tabs=win-install%2Cwin-user-install%2Credhat-install%2Cwindows-uninstall%2Credhat-uninstall

### 1. Ensure the SQLServer 2022 container is running

### 2. Start Azure Data Studio and click on New Connection

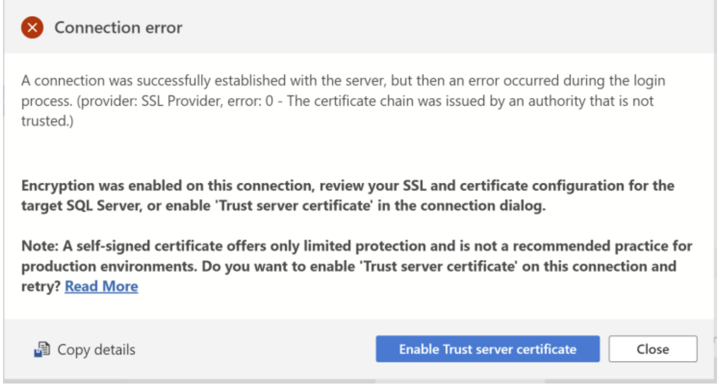
- Use below login details, password, as you set it when creating the docker container.
- Click Connect



Connection Details

| | |
|---|---|
| Connection type | Microsoft SQL Server |
| Input type | ● Parameters ○ Connection String |
| Server * | localhost,14333 |
| Authentication type | SQL Login |
| User name * | sa |
| Password | •••••••••••• |
| | ☑ Remember password |
| Database | <Default> |
| Encrypt | Mandatory |
| Trust server certificate | True |
| Server group | <Default> |
| Name (optional) | |

- Accept any SSL certificate



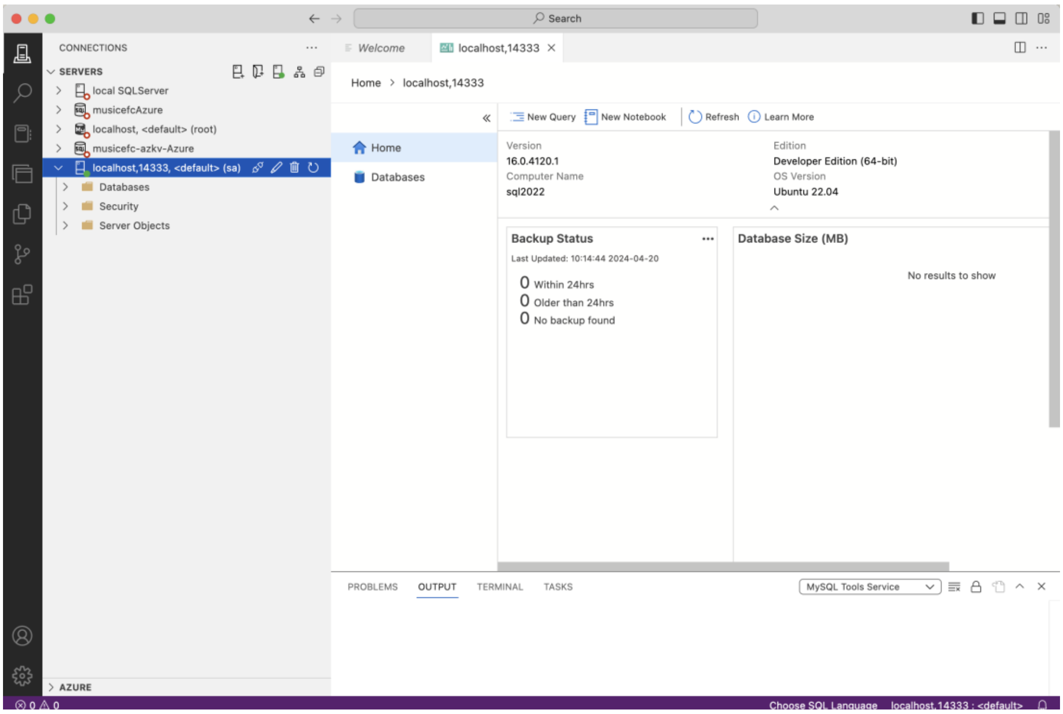
Connection error

A connection was successfully established with the server, but then an error occurred during the login process. (provider: SSL Provider, error: 0 - The certificate chain was issued by an authority that is not trusted.)

**Encryption was enabled on this connection, review your SSL and certificate configuration for the target SQL Server, or enable 'Trust server certificate' in the connection dialog.**

**Note: A self-signed certificate offers only limited protection and is not a recommended practice for production environments. Do you want to enable 'Trust server certificate' on this connection and retry?** Read More

You screen should be something like below:



Version
16.0.4120.1
Computer Name
sql2022

Edition
Developer Edition (64-bit)
OS Version
Ubuntu 22.04

Backup Status
Last Updated: 10:14:44 2024-04-20
0 Within 24hrs
0 Older than 24hrs
0 No backup found

Database Size (MB)
No results to show

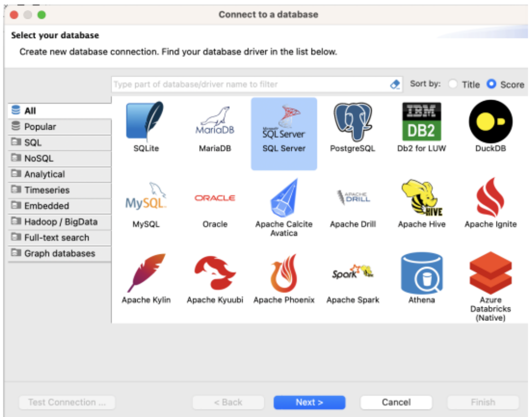
# DBeaver

DBeaver is a popular opensource database tool for developers that supports most popular databases, including MySQL, PostgreSQL, SQLite, MariaDb, SQL Server, and many more.

https://dbeaver.io

## 1. Ensure the SQL Server 2022 container is running

## 2. Start DBeaver and click on New SQL Server Connection

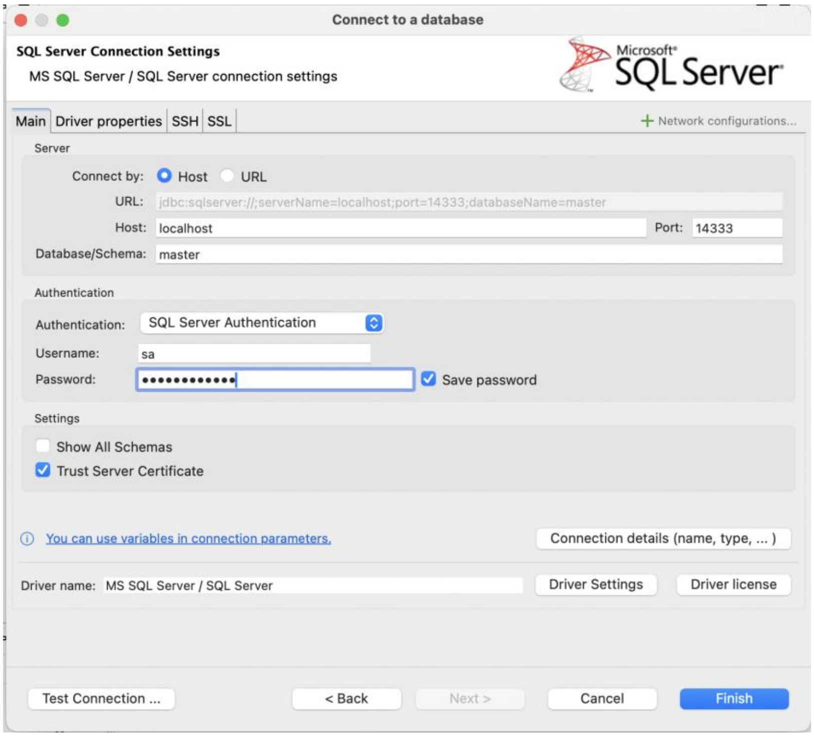


Connect to a database

Select your database

Create new database connection. Find your database driver in the list below.

- Use below login details, password, as you set it when creating the docker container.
- Click Finish



Connect to a database

SQL Server Connection Settings

MS SQL Server / SQL Server connection settings

Server

Connect by: ● Host ○ URL

URL: jdbc:sqlserver://;serverName=localhost;port=14333;databaseName=master

Host: localhost

Port: 14333

Database/Schema: master

Authentication

Authentication: SQL Server Authentication

Username: sa

Password: ••••••••••••

☑ Save password

Settings

□ Show All Schemas

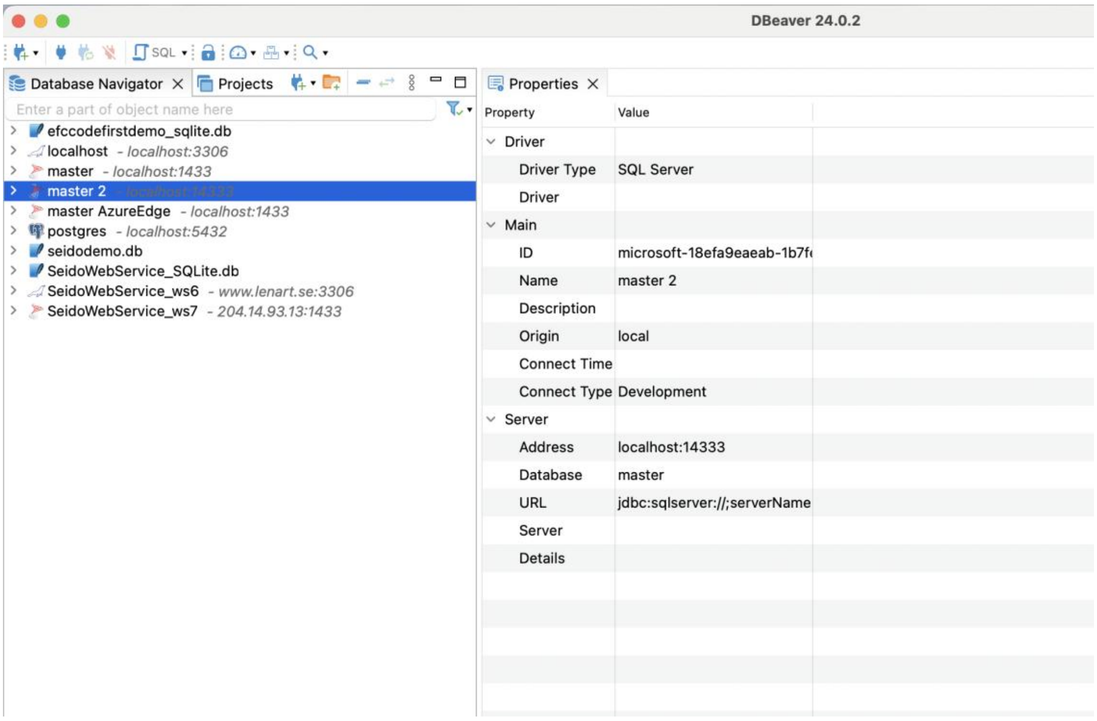
☑ Trust Server Certificate

You can use variables in connection parameters.

Driver name: MS SQL Server / SQL Server

- Accept any SSL certificate

You screen should be something like below. I have several databases setup so for you only master will show.



- efccodefirstdemo_sqlite.db
- localhost - localhost:3306
- master - localhost:1433
- master 2 - localhost:14333
- master AzureEdge - localhost:1433
- postgres - localhost:5432
- seidodemo.db
- SeidoWebService_SQLite.db
- SeidoWebService_ws6 - www.lenart.se:3306
- SeidoWebService_ws7 - 204.14.93.13:1433

| Property | Value |
|---|---|
| Driver | |
| Driver Type | SQL Server |
| Driver | |
| Main | |
| ID | microsoft-18efa9eaeab-1b7f |
| Name | master 2 |
| Description | |
| Origin | local |
| Connect Time | |
| Connect Type | Development |
| Server | |
| Address | localhost:14333 |
| Database | master |
| URL | jdbc:sqlserver://;serverName |
| Server | |
| Details | |

# SQL Server 2022 Docker container installation (Windows 11)

## 1. Needed commands.

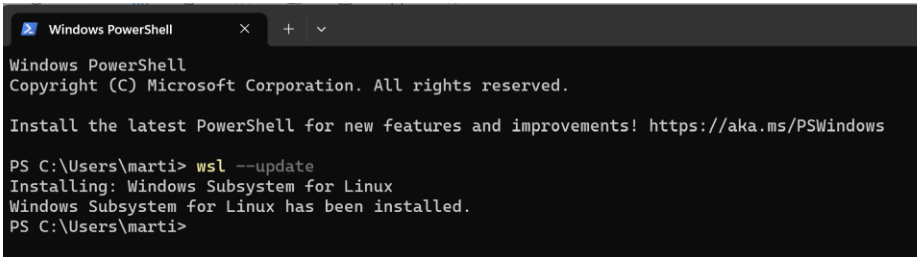
In my repository I list the commands needed. Below you can copy one-by-one following the steps.
https://github.com/SEIDOAB-SQL/SQLDB_sql/blob/main/docker/create_sqlserver2022_docker.sh

## 2. Update Windows Linux Subsystem

You may be required to install or update Windows Linux Subsystem.

Use repo-command marked
#Only on Windows11 ensure you have last version of WindowsLinuxSubsystem installed

In powershell type:
wsl --update

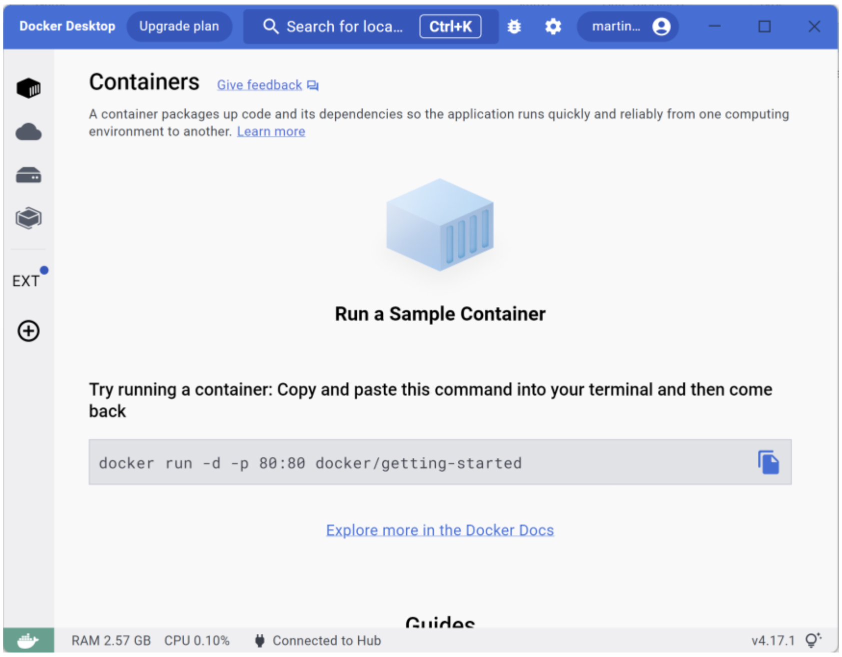


```
Windows PowerShell
Copyright (C) Microsoft Corporation. All rights reserved.

Install the latest PowerShell for new features and improvements! https://aka.ms/PSWindows

PS C:\Users\marti> wsl --update
Installing: Windows Subsystem for Linux
Windows Subsystem for Linux has been installed.
PS C:\Users\marti>
```

## 3. Download and install Docker Desktop

https://www.docker.com/products/docker-desktop/

It will look something like:



Containers Give feedback

A container packages up code and its dependencies so the application runs quickly and reliably from one computing environment to another. Learn more

Try running a container: Copy and paste this command into your terminal and then come back

```
docker run -d -p 80:80 docker/getting-started
```

## 4. Pull the SQLServer container

Use repo-command marked
#pull the container image to my computer

In powershell type:
docker pull mcr.microsoft.com/mssql/server:2022-latest

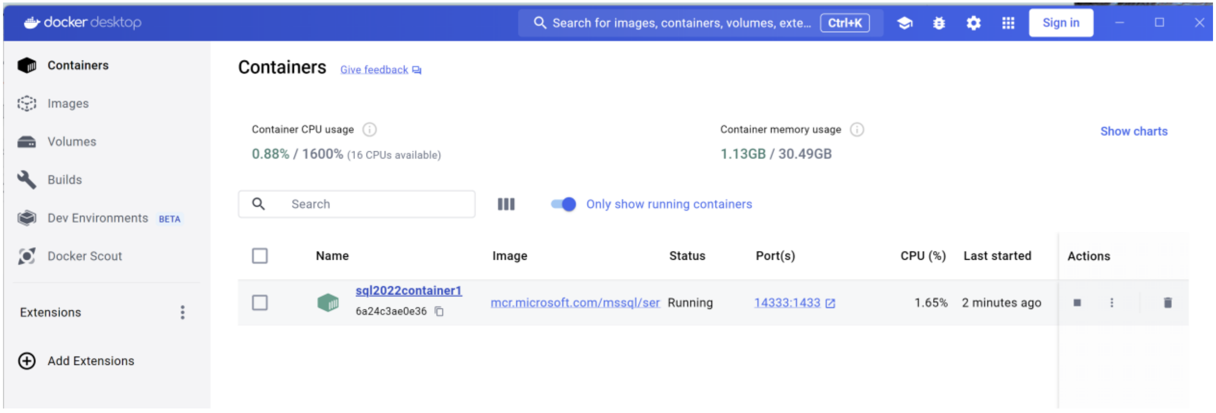
## 5. Install and run container

Use repo-command marked
#install and run the container

In powershell type:

```
docker run -e "ACCEPT_EULA=Y" -e "MSSQL_SA_PASSWORD=skYhgS@83#aQ" -p
14333:1433 --name sql2022container --hostname sql2022 -d
mcr.microsoft.com/mssql/server:2022-latest
```

Now your Docker Desktop should look something as below. You can start and stop the sql2022container by clicking on the Actions icon.



Container CPU usage
0.88% / 1600% (16 CPUs available)

Container memory usage
1.13GB / 30.49GB

| □ | Name | Image | Status | Port(s) | CPU (%) | Last started | Actions |
|---|---|---|---|---|---|---|---|
| □ | sql2022container1<br>6a24c3ae0e36 | mcr.microsoft.com/mssql/ser | Running | 14333:1433 | 1.65% | 2 minutes ago | ■ ⋮ 🗑 |

# Database tools installation (Windows 11)

## Azure Data Studio

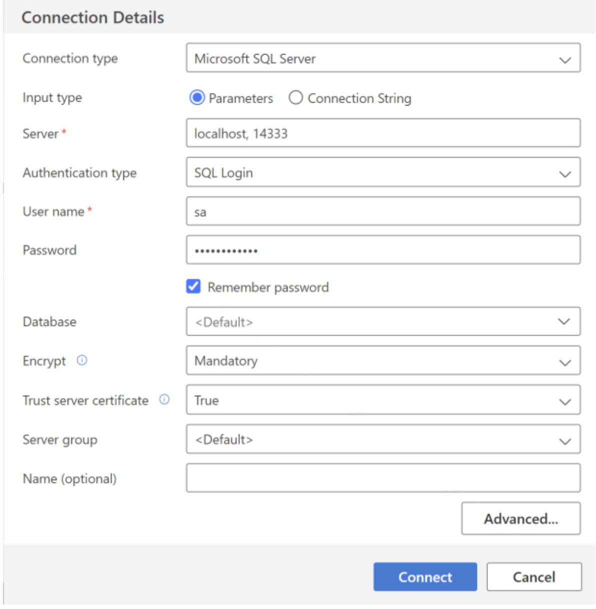
[https://learn.microsoft.com/en-us/azure-data-studio/download-azure-data-studio?tabs=win-install%2Cwin-user-install%2Credhat-install%2Cwindows-uninstall%2Credhat-uninstall](https://learn.microsoft.com/en-us/azure-data-studio/download-azure-data-studio?tabs=win-install%2Cwin-user-install%2Credhat-install%2Cwindows-uninstall%2Credhat-uninstall)

Connect Azure Data Studio to SQLServer 2022

1. **Ensure the SQL Server 2022 container is running**

2. **Start Azure Data Studio and click on New Connection**

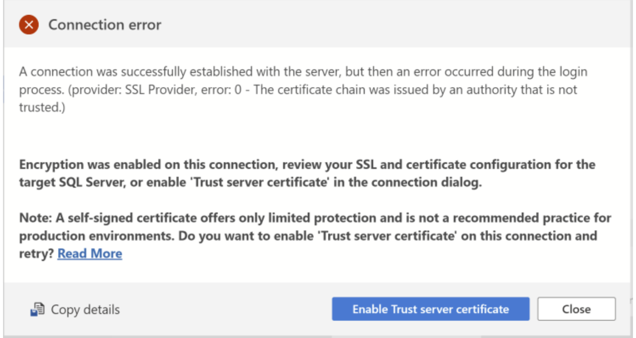
- Use below login details, password, as you set it when creating the docker container.
- Click Connect



Connection Details

Connection type: Microsoft SQL Server
Input type: ● Parameters ○ Connection String
Server *: localhost, 14333
Authentication type: SQL Login
User name *: sa
Password: ••••••••••••
☑ Remember password
Database: <Default>
Encrypt: Mandatory
Trust server certificate: True
Server group: <Default>
Name (optional):

- Accept any SSL certificate



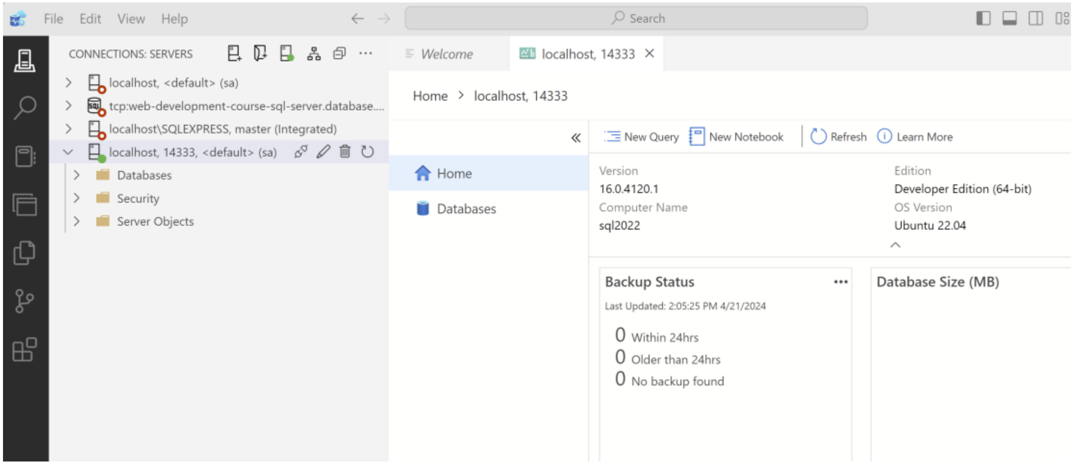
Connection error

A connection was successfully established with the server, but then an error occurred during the login process. (provider: SSL Provider, error: 0 - The certificate chain was issued by an authority that is not trusted.)

**Encryption was enabled on this connection, review your SSL and certificate configuration for the target SQL Server, or enable 'Trust server certificate' in the connection dialog.**

**Note: A self-signed certificate offers only limited protection and is not a recommended practice for production environments. Do you want to enable 'Trust server certificate' on this connection and retry? Read More**

You screen should be something like below.



Version
16.0.4120.1

Computer Name
sql2022

Edition
Developer Edition (64-bit)

OS Version
Ubuntu 22.04

Backup Status

Last Updated: 2:05:25 PM 4/21/2024

0 Within 24hrs

0 Older than 24hrs

0 No backup found

Database Size (MB)

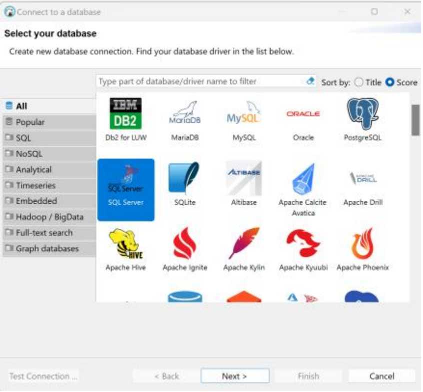
# DBeaver

DBeaver is a popular opensource database tool for developers that supports most popular databases, including MySQL, PostgreSQL, SQLite, MariaDb, SQL Server, and many more. Download and install from:
https://dbeaver.io

Connect DBeaver to SQLServer 2022

## 1. Ensure the container is running

## 2. Start DBeaver and click on New SQL Server Connection



Connect to a database

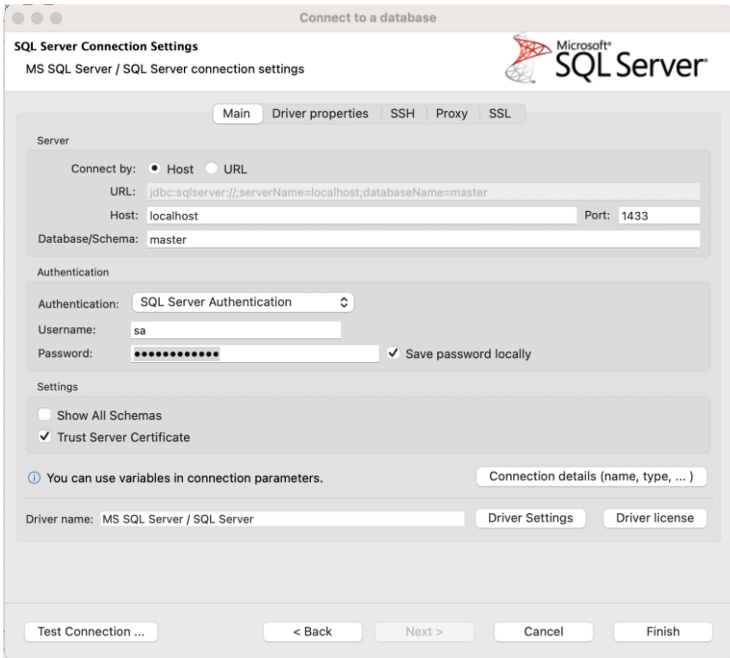
**Select your database**

Create new database connection. Find your database driver in the list below.

Type part of database/driver name to filter — Sort by: ○ Title ● Score

- Use below login details, password, as you set it when creating the docker container.
- Click Finish

- Download any drivers requested
- Accept any SSL certificate



Connect to a database

**SQL Server Connection Settings**

MS SQL Server / SQL Server connection settings

Server

Connect by: ● Host ○ URL

URL: jdbc:sqlserver://;serverName=localhost;databaseName=master

Host: localhost    Port: 1433

Database/Schema: master

Authentication

Authentication: SQL Server Authentication

Username: sa

Password: ●●●●●●●●●●●●    ✓ Save password locally

Settings

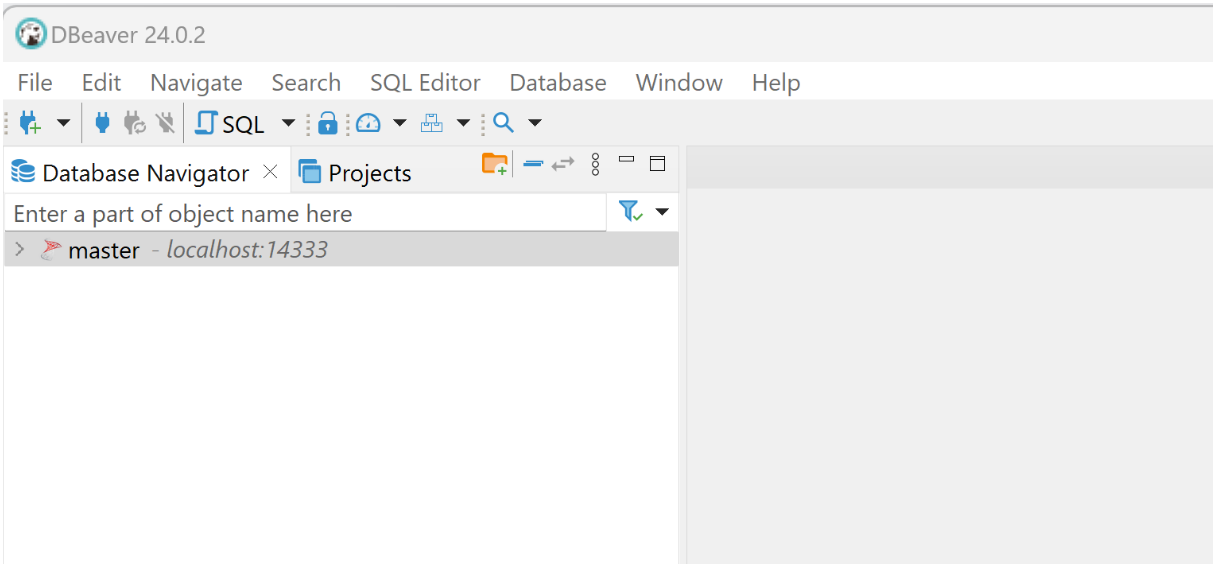
□ Show All Schemas

✓ Trust Server Certificate

ⓘ You can use variables in connection parameters.

Driver name: MS SQL Server / SQL Server

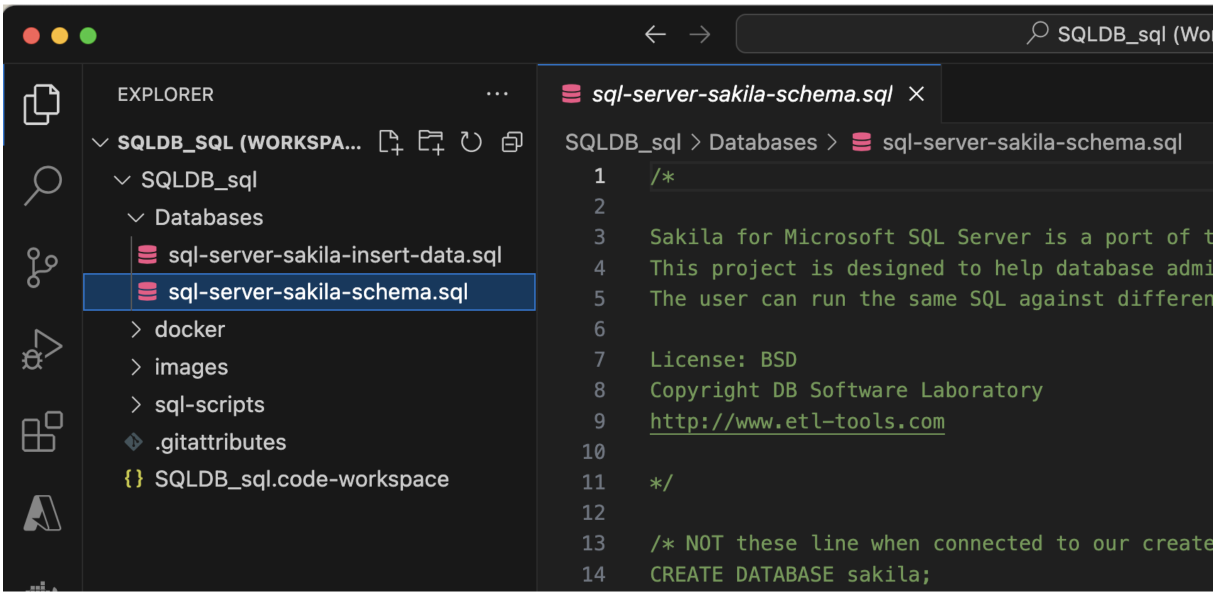
You screen should be something like below. I have several databases setup so for you only master will show.



# Demo database sakila installation (Windows 11 and macOS)

Sakila is easiest created by creating a new database and populate it by running som sql scrips which are part of the course repository SQLDB_sql.

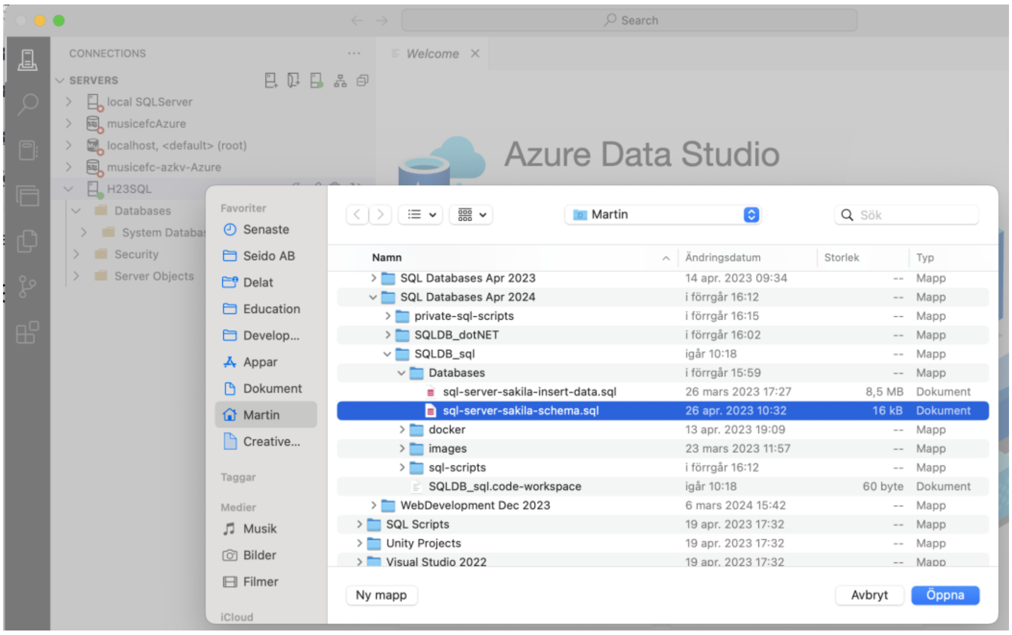
https://github.com/SEIDOAB-SQL/SQLDB_sql/tree/main/Databases


SQLDB_sql (Wo
EXPLORER
SQLDB_SQL (WORKSPA...
SQLDB_sql
Databases
sql-server-sakila-insert-data.sql
sql-server-sakila-schema.sql
docker
images
sql-scripts
.gitattributes
SQLDB_sql.code-workspace
sql-server-sakila-schema.sql
SQLDB_sql > Databases > sql-server-sakila-schema.sql

```
/*

Sakila for Microsoft SQL Server is a port of t
This project is designed to help database admi
The user can run the same SQL against differen

License: BSD
Copyright DB Software Laboratory
http://www.etl-tools.com

*/

/* NOT these line when connected to our create
CREATE DATABASE sakila;
```

## 1. Create Sakila database in SQL Server 2022 Container using Azure Data Studio

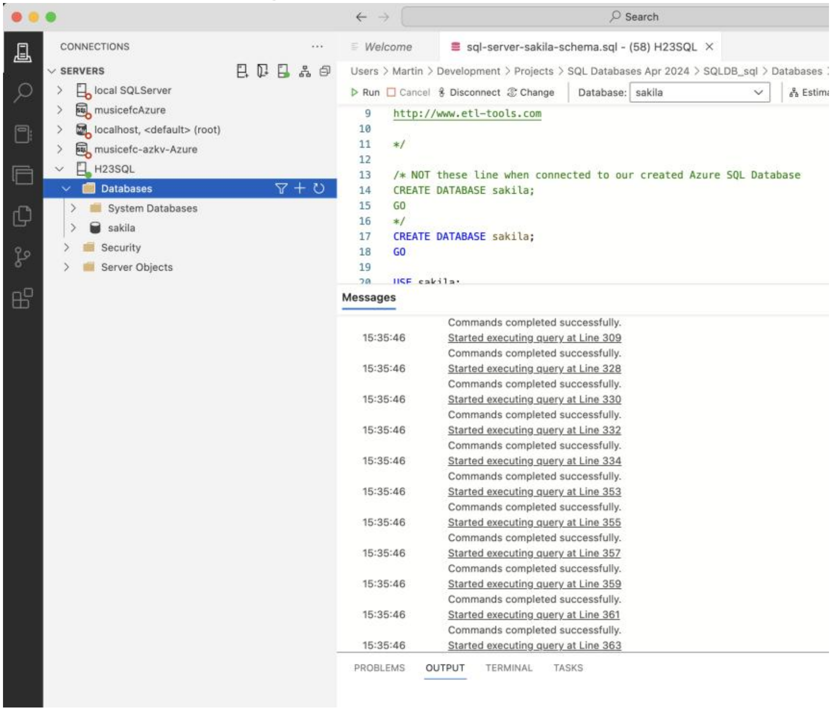
- Open Azure Data Studio and connect to SQL Server 2022
- From Azure Data Studio open the sql script, sql-server-sakila-schema.sql, from Databases directory in the course repository



| Namn | Ändringsdatum | Storlek | Typ |
|---|---|---|---|
| SQL Databases Apr 2023 | 14 apr. 2023 09:34 | -- | Mapp |
| SQL Databases Apr 2024 | i förrgår 16:12 | -- | Mapp |
| private-sql-scripts | i förrgår 16:15 | -- | Mapp |
| SQLDB_dotNET | i förrgår 16:02 | -- | Mapp |
| SQLDB_sql | igår 10:18 | -- | Mapp |
| Databases | i förrgår 15:59 | -- | Mapp |
| sql-server-sakila-insert-data.sql | 26 mars 2023 17:27 | 8,5 MB | Dokument |
| sql-server-sakila-schema.sql | 26 apr. 2023 10:32 | 16 kB | Dokument |
| docker | 13 apr. 2023 19:09 | -- | Mapp |
| images | 23 mars 2023 11:57 | -- | Mapp |
| sql-scripts | i förrgår 16:12 | -- | Mapp |
| SQLDB_sql.code-workspace | igår 10:18 | 60 byte | Dokument |
| WebDevelopment Dec 2023 | 6 mars 2024 15:42 | -- | Mapp |
| SQL Scripts | 19 apr. 2023 17:32 | -- | Mapp |
| Unity Projects | 19 apr. 2023 17:32 | -- | Mapp |
| Visual Studio 2022 | 19 apr. 2023 17:32 | -- | Mapp |

- Run the script.
- Select the SQL Server connection when requested
- Refresh Database folder to see sakila database.

It will look something like below:

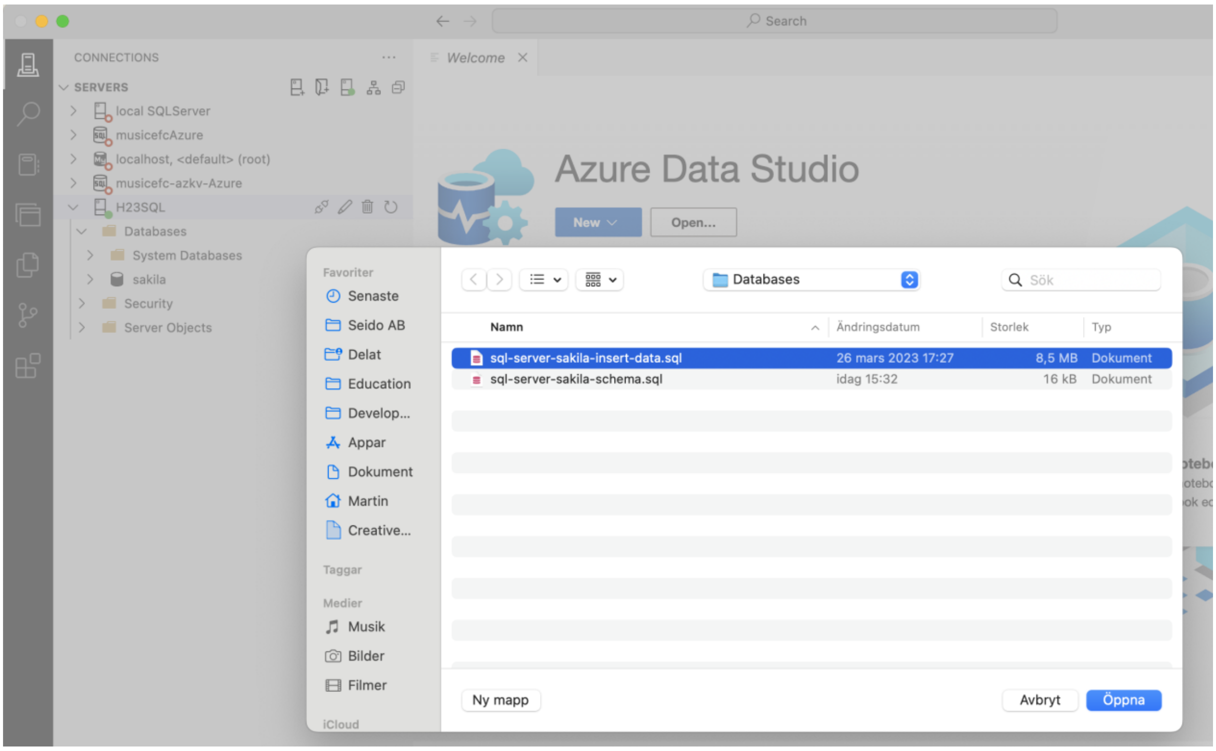


```
http://www.etl-tools.com

*/

/* NOT these line when connected to our created Azure SQL Database
CREATE DATABASE sakila;
GO
*/
CREATE DATABASE sakila;
GO

USE sakila;
```

```
          Commands completed successfully.
15:35:46  Started executing query at Line 309
          Commands completed successfully.
15:35:46  Started executing query at Line 328
          Commands completed successfully.
15:35:46  Started executing query at Line 330
          Commands completed successfully.
15:35:46  Started executing query at Line 332
          Commands completed successfully.
15:35:46  Started executing query at Line 334
          Commands completed successfully.
15:35:46  Started executing query at Line 353
          Commands completed successfully.
15:35:46  Started executing query at Line 355
          Commands completed successfully.
15:35:46  Started executing query at Line 357
          Commands completed successfully.
15:35:46  Started executing query at Line 359
          Commands completed successfully.
15:35:46  Started executing query at Line 361
          Commands completed successfully.
15:35:46  Started executing query at Line 363
```

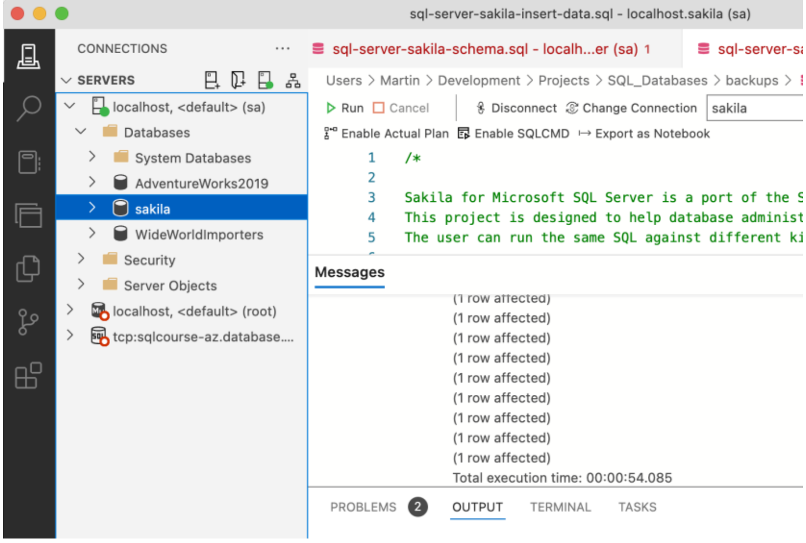
## 2. Populate Sakila database in SQL Server 2022 Container using Azure Data Studio

- Open Azure Data Studio and connect to SQL Server 2022
- From Azure Data Studio open the sql script, sql-server-sakila-insert-data.sql, from Databases directory in the course repository



| Namn | Ändringsdatum | Storlek | Typ |
|---|---|---|---|
| sql-server-sakila-insert-data.sql | 26 mars 2023 17:27 | 8,5 MB | Dokument |
| sql-server-sakila-schema.sql | idag 15:32 | 16 kB | Dokument |

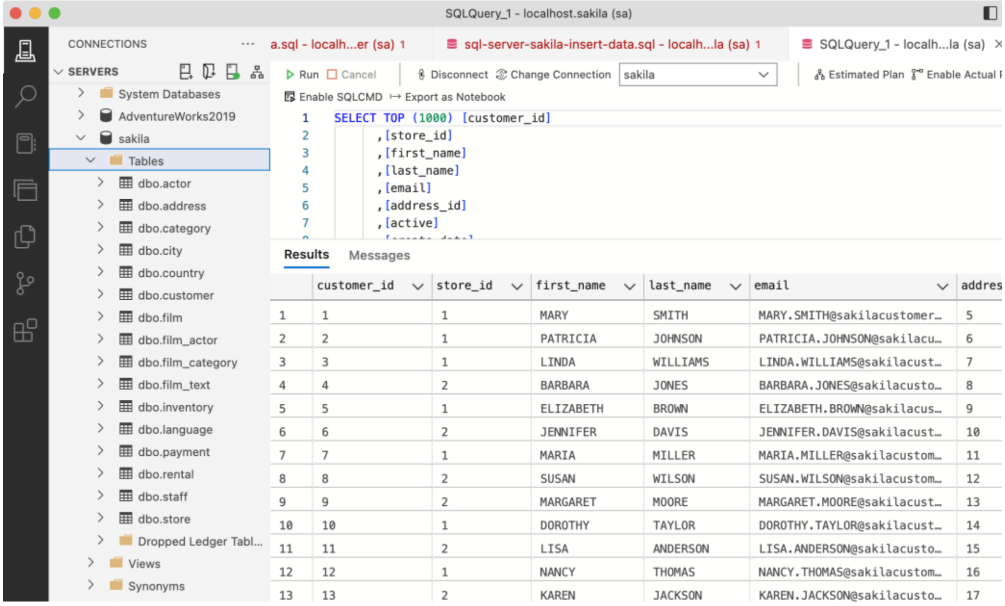
- Run the script, it will take a couple of minutes to complete, but after a while it will look like:


sql-server-sakila-insert-data.sql - localhost.sakila (sa)
CONNECTIONS
SERVERS
localhost, <default> (sa)
Databases
System Databases
AdventureWorks2019
sakila
WideWorldImporters
Security
Server Objects
localhost, <default> (root)
tcp:sqlcourse-az.database....
sql-server-sakila-schema.sql - localh...er (sa) 1
sql-server-s
Users > Martin > Development > Projects > SQL_Databases > backups >
Run
Cancel
Disconnect
Change Connection
sakila
Enable Actual Plan
Enable SQLCMD
Export as Notebook
Messages
PROBLEMS 2
OUTPUT
TERMINAL
TASKS

```
/*

Sakila for Microsoft SQL Server is a port of the S
This project is designed to help database administ
The user can run the same SQL against different ki
```

```
(1 row affected)
(1 row affected)
(1 row affected)
(1 row affected)
(1 row affected)
(1 row affected)
(1 row affected)
(1 row affected)
(1 row affected)
(1 row affected)
Total execution time: 00:00:54.085
```

- Now you can open the sakila database, open Tables, right click on dbo.customer -> Select top 1000. It will look something like.



```sql
SELECT TOP (1000) [customer_id]
      ,[store_id]
      ,[first_name]
      ,[last_name]
      ,[email]
      ,[address_id]
      ,[active]
```

| | customer_id | store_id | first_name | last_name | email | addres |
|---|---|---|---|---|---|---|
| 1 | 1 | 1 | MARY | SMITH | MARY.SMITH@sakilacustomer… | 5 |
| 2 | 2 | 1 | PATRICIA | JOHNSON | PATRICIA.JOHNSON@sakilacu… | 6 |
| 3 | 3 | 1 | LINDA | WILLIAMS | LINDA.WILLIAMS@sakilacust… | 7 |
| 4 | 4 | 2 | BARBARA | JONES | BARBARA.JONES@sakilacusto… | 8 |
| 5 | 5 | 1 | ELIZABETH | BROWN | ELIZABETH.BROWN@sakilacus… | 9 |
| 6 | 6 | 2 | JENNIFER | DAVIS | JENNIFER.DAVIS@sakilacust… | 10 |
| 7 | 7 | 1 | MARIA | MILLER | MARIA.MILLER@sakilacustom… | 11 |
| 8 | 8 | 2 | SUSAN | WILSON | SUSAN.WILSON@sakilacustom… | 12 |
| 9 | 9 | 2 | MARGARET | MOORE | MARGARET.MOORE@sakilacust… | 13 |
| 10 | 10 | 1 | DOROTHY | TAYLOR | DOROTHY.TAYLOR@sakilacust… | 14 |
| 11 | 11 | 2 | LISA | ANDERSON | LISA.ANDERSON@sakilacusto… | 15 |
| 12 | 12 | 1 | NANCY | THOMAS | NANCY.THOMAS@sakilacustom… | 16 |
| 13 | 13 | 2 | KAREN | JACKSON | KAREN.JACKSON@sakilacusto… | 17 |

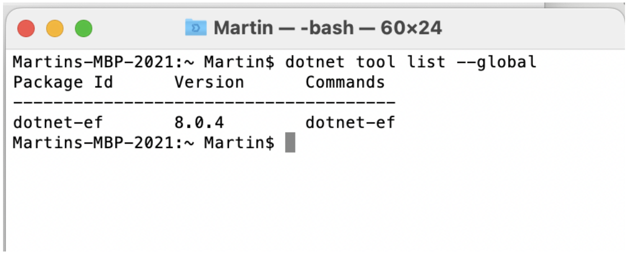
# Install Entity Framework Core

EntityFrameworkCore is a popular ORM tool for .NET allowing you to access and work with various modern databases such as SQL Server, mySQL, Postgres directly from .NET using C#.

https://learn.microsoft.com/en-us/ef/core/
[https://learn.microsoft.com/en-us/ef/core/cli/dotnet](https://learn.microsoft.com/en-us/ef/core/cli/dotnet)

- Open a terminal (macOS) or powershell on Windows11 and type:
  dotnet tool list --global

- If you see something like below, the tool is installed.

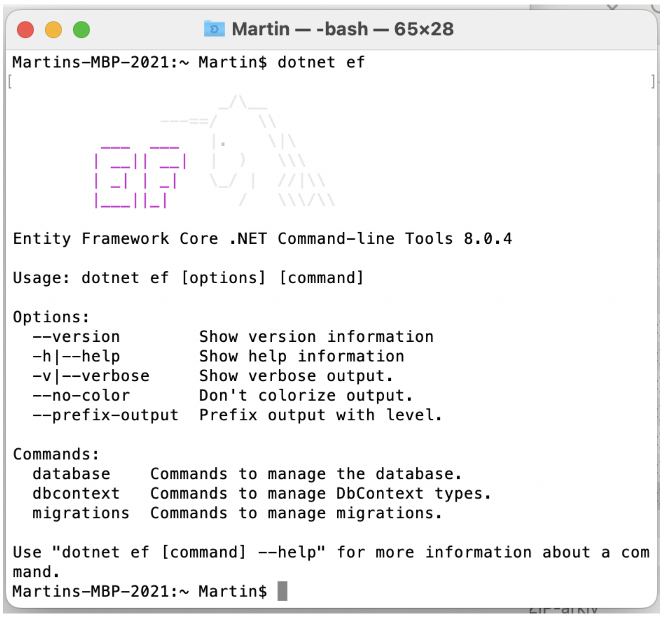


```
Martins-MBP-2021:~ Martin$ dotnet tool list --global
Package Id      Version      Commands
---------------------------------------
dotnet-ef       8.0.4        dotnet-ef
Martins-MBP-2021:~ Martin$ 
```

- If you do not have any dotnet-ef tool installed, type following to install:
  dotnet tool install --global dotnet-ef

- To update, type:
  dotnet tool update --global dotnet-ef

- Typing below will show you the efc cli command syntax and help:
  dotnet ef



```
Martins-MBP-2021:~ Martin$ dotnet ef

                     _/\__
               ---==/    \\
         ___  ___   |.    \|\
        | __|| __|  |  )   \\\
        | _| | _|   \_/ |  //|\\
        |___||_|       /   \\\/\\

Entity Framework Core .NET Command-line Tools 8.0.4

Usage: dotnet ef [options] [command]

Options:
  --version        Show version information
  -h|--help        Show help information
  -v|--verbose     Show verbose output.
  --no-color       Don't colorize output.
  --prefix-output  Prefix output with level.

Commands:
  database     Commands to manage the database.
  dbcontext    Commands to manage DbContext types.
  migrations   Commands to manage migrations.

Use "dotnet ef [command] --help" for more information about a com
mand.
Martins-MBP-2021:~ Martin$ 
```

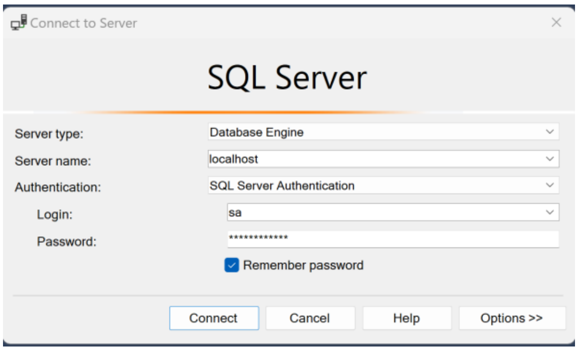
# Appendix

## SQL Server Management Studio (SSMS)

SSMS is an excellent tool but SQL Server centric, Windows only, Microsoft legacy tool.

Download SQL Server Management Studio (SSMS) - SQL Server Management Studio (SSMS) | Microsoft Learn

Connect SSMS to SQLServer 2022



Server type: Database Engine
Server name: localhost
Authentication: SQL Server Authentication
Login: sa
Password: ************
☑ Remember password

You screen should be something like below.

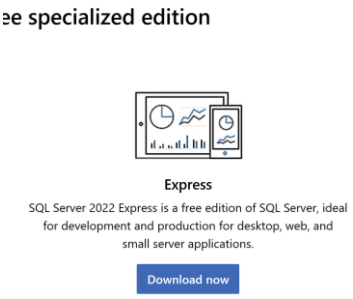
# SQL Server Express

**You should prioritize to run SQL Server in a docker container as described in this document. This is industry standard today.**

**However, as an alternative, you can install a Windows only, Windows legacy, SQL Server Express.**

## 1. Download and install SQL Server Express

[https://www.microsoft.com/en-us/sql-server/sql-server-downloads](https://www.microsoft.com/en-us/sql-server/sql-server-downloads)

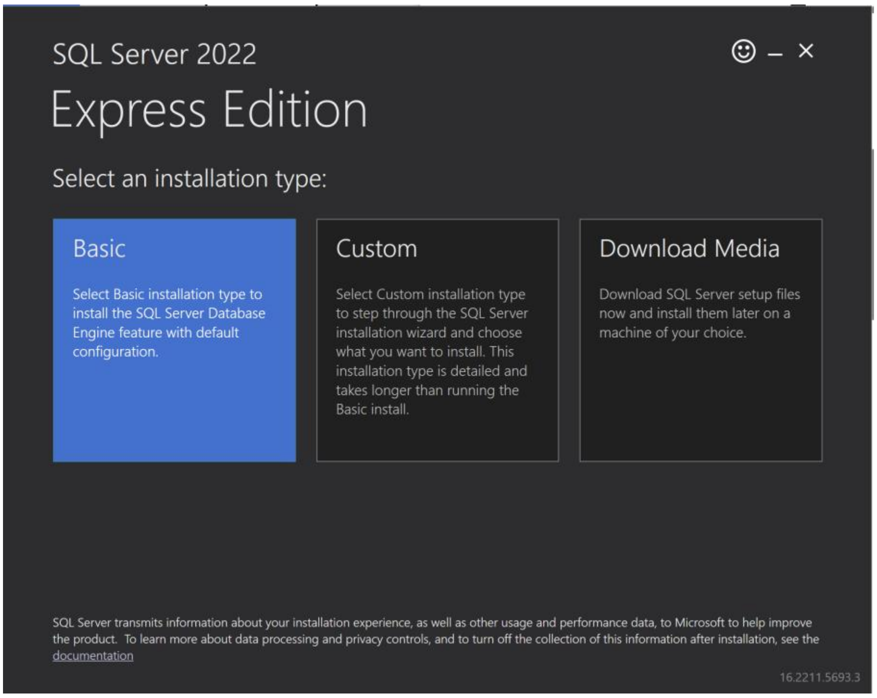


ee specialized edition

Express

SQL Server 2022 Express is a free edition of SQL Server, ideal for development and production for desktop, web, and small server applications.

## 2. Install Basic version



SQL Server 2022

Express Edition

Select an installation type:

Basic

Select Basic installation type to install the SQL Server Database Engine feature with default configuration.

Custom

Select Custom installation type to step through the SQL Server installation wizard and choose what you want to install. This installation type is detailed and takes longer than running the Basic install.

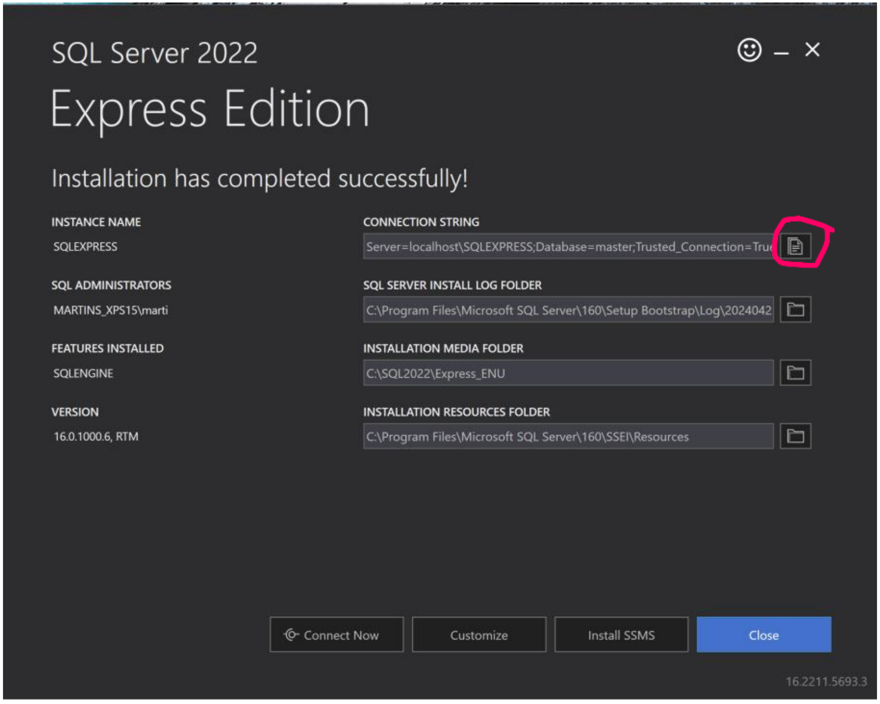
Download Media

Download SQL Server setup files now and install them later on a machine of your choice.

SQL Server transmits information about your installation experience, as well as other usage and performance data, to Microsoft to help improve the product. To learn more about data processing and privacy controls, and to turn off the collection of this information after installation, see the documentation

16.2211.5693.3

- **When installation is complete, you can copy the connection string to the clipboard.**



SQL Server 2022

Express Edition

Installation has completed successfully!

INSTANCE NAME
SQLEXPRESS

CONNECTION STRING
Server=localhost\SQLEXPRESS;Database=master;Trusted_Connection=Tru

SQL ADMINISTRATORS
MARTINS_XPS15\marti

SQL SERVER INSTALL LOG FOLDER
C:\Program Files\Microsoft SQL Server\160\Setup Bootstrap\Log\2024042

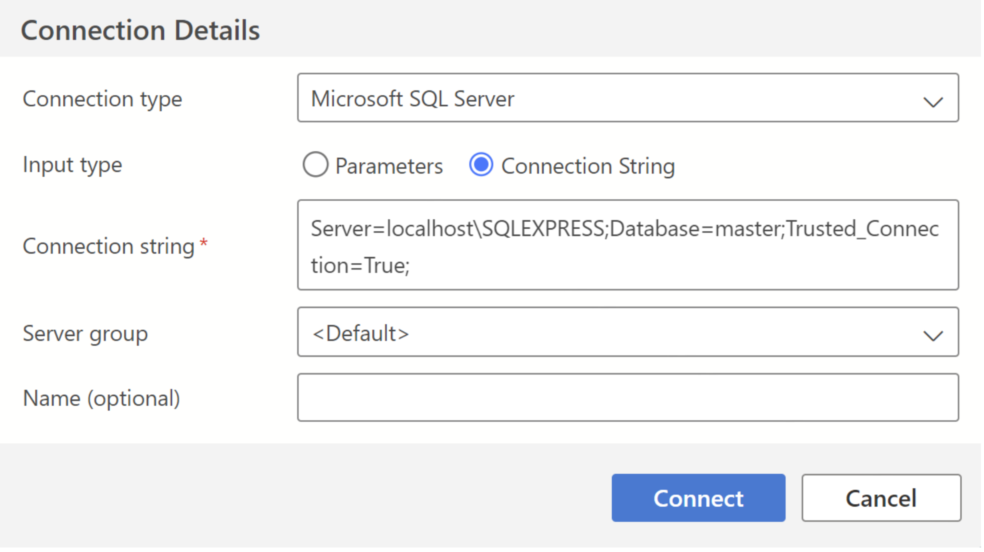
FEATURES INSTALLED
SQLENGINE

INSTALLATION MEDIA FOLDER
C:\SQL2022\Express_ENU

VERSION
16.0.1000.6, RTM

INSTALLATION RESOURCES FOLDER
C:\Program Files\Microsoft SQL Server\160\SSEI\Resources

3. **Create a new connection in Azure Data Studio and paste the connection string and connect.**



Connection Details

Connection type: Microsoft SQL Server

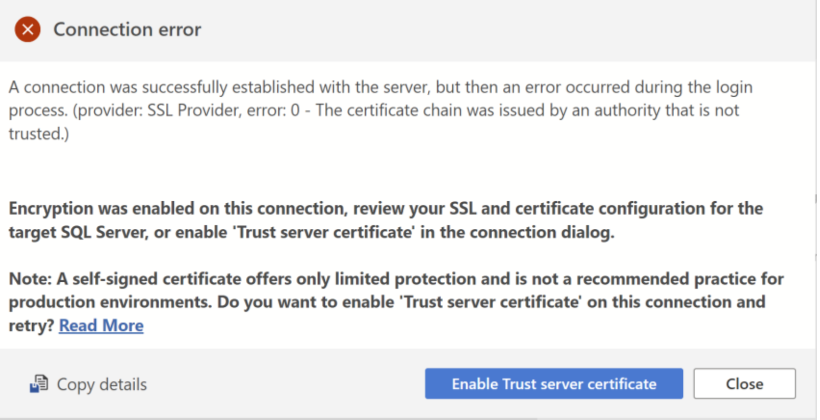
Input type: ○ Parameters ● Connection String

Connection string *: Server=localhost\SQLEXPRESS;Database=master;Trusted_Connection=True;

Server group: <Default>

Name (optional):

- **Trust any certificate**

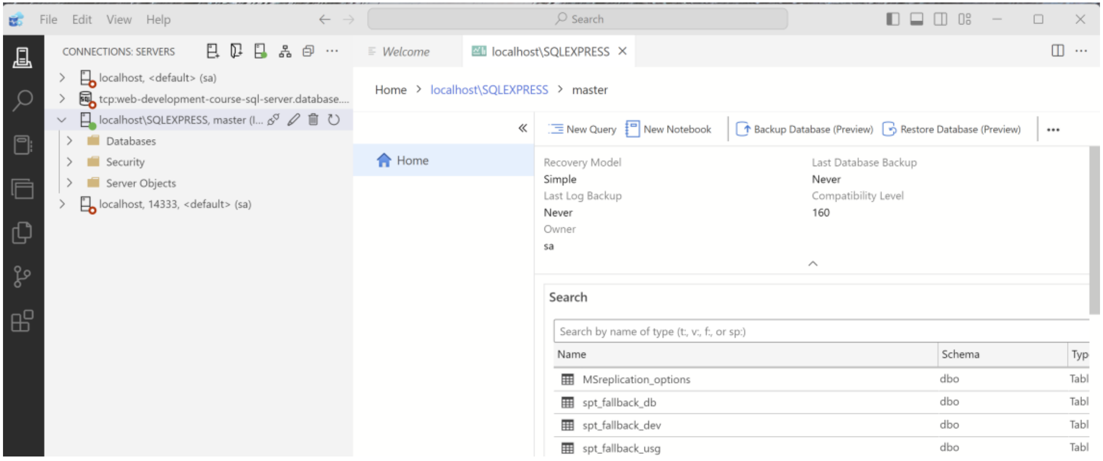


A connection was successfully established with the server, but then an error occurred during the login process. (provider: SSL Provider, error: 0 - The certificate chain was issued by an authority that is not trusted.)

**Encryption was enabled on this connection, review your SSL and certificate configuration for the target SQL Server, or enable 'Trust server certificate' in the connection dialog.**

**Note: A self-signed certificate offers only limited protection and is not a recommended practice for production environments. Do you want to enable 'Trust server certificate' on this connection and retry? Read More**

**Now you should have a connection and it should look something like:**


File
Edit
View
Help
Search
CONNECTIONS: SERVERS
localhost, <default> (sa)
tcp:web-development-course-sql-server.database....
localhost\SQLEXPRESS, master (l...
Databases
Security
Server Objects
localhost, 14333, <default> (sa)
Welcome
localhost\SQLEXPRESS
Home
localhost\SQLEXPRESS
master
Home
New Query
New Notebook
Backup Database (Preview)
Restore Database (Preview)
Search

Recovery Model
Simple

Last Database Backup
Never

Last Log Backup
Never

Compatibility Level
160

Owner
sa

Search by name of type (t:, v:, f:, or sp:)

| Name | Schema | Typ |
|---|---|---|
| MSreplication_options | dbo | Tabl |
| spt_fallback_db | dbo | Tabl |
| spt_fallback_dev | dbo | Tabl |
| spt_fallback_usg | dbo | Tabl |