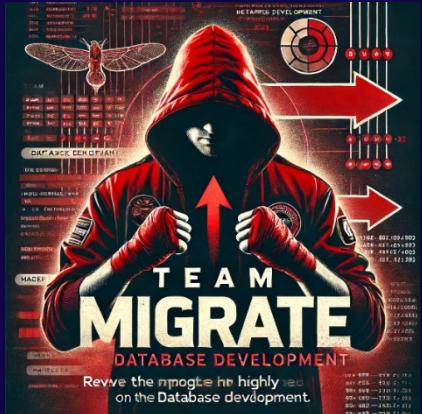
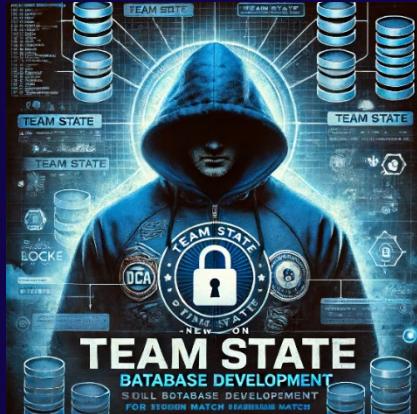


The Database DevOps (CI/CD) Showdown



VS



Tonie Huizer

He/him

Olivier van Steenlandt

He/him

Olivier Van Steenlandt

He/Him



Business Intelligence Teamlead



Core Member @ dataMinds.be

[/in/oliviervansteenlandt](https://www.linkedin.com/in/oliviervansteenlandt)

[@Oli_VSteenlandt](https://twitter.com/Oli_VSteenlandt)



DATA-CUISINE.COM
BITE SIZE DATA TALES



Tonie Huizer

He/Him



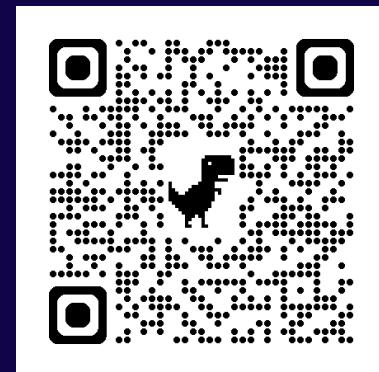
promicro

 [/in/toniehuizer](https://www.linkedin.com/in/toniehuizer)

 [@promicroNL](https://twitter.com/promicroNL)

 red-gate.com/blog/author/tonie-huizer

 www.promicro.nl



Schedule

- 9:00 AM – 10:45 AM Pre-Conference Session
- 10:45 AM – 11:00 AM Refreshment Break
- 11:00 AM – 12:30 PM Pre-Conference Session
- 12:30 PM – 1:30 PM Pre-Conference Lunch
- 1:30 PM – 2:45 PM Pre-Conference Session
- 2:45 PM – 3:00 PM Refreshment Break
- 3:00 PM – 5:00 PM Pre-Conference Session

VM's for the labs

- We have pre-configured VM's set up for you
 - Get first hand experience
- Thanks Redgate for this

Username	.\\Redgate
Password	DatabaseDevOps!



PASS 24

Data Community Summit

Round 1

Introduction & Basics

Why?

Use Case from the Field (1/4)

Moving Big Projects
to Production



Use Case from the Field (2/4)

Priority Changes



Use Case from the Field (3/4)

Unwanted changes
in Production



Use Case from the Field (4/4)

Code went missing



Why - Summary?

Flexibility

Time-Saving

Less room for mistakes/misconfiguration

Communication

Basics & Guidelines

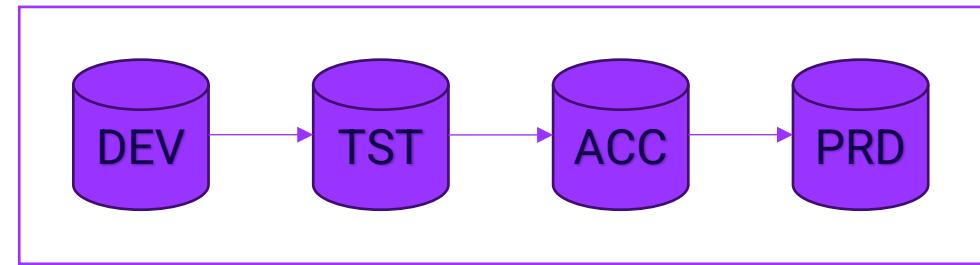
Shared Environment

Shared Environment

DTAP

More Complex to manage

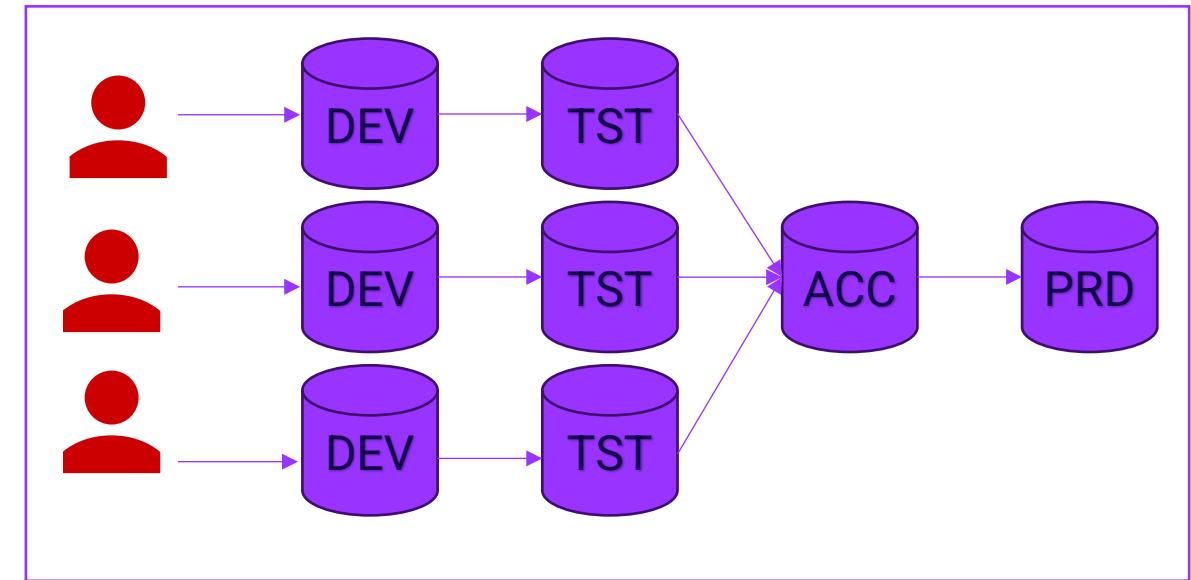
Cheap



Dedicated Environment

Dedicated environment

- What is it?
- Why do you want it?
- Complex initial setup



Git Basics

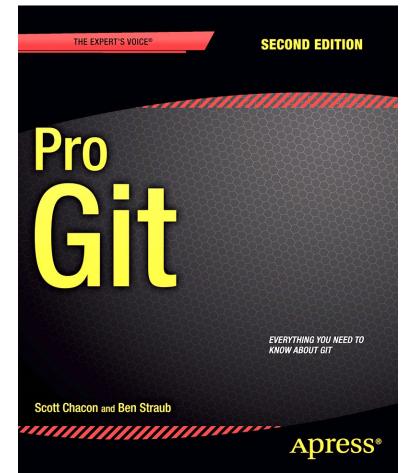
GIT Basics

Distributed Version Control System

Keeping track of changes in files

Ex: .sql files 😊

Free eBook: <https://git-scm.com/book/en/v2>



GIT Basics - Installing

<https://git-scm.com/downloads>

The screenshot shows the 'Downloads' section of the Git website. At the top, there's a navigation bar with links for 'About', 'Documentation', 'Downloads' (which is highlighted in red), and 'Community'. Below this, there's a sidebar with a link to the 'Pro Git book'. The main content area features a large 'Downloads' heading and three download links for 'macOS', 'Windows', and 'Linux/Unix'. To the right, there's a section for the 'Latest source Release 2.46.0' with a 'Download for Windows' button. Below these, there are sections for 'GUI Clients' and 'Logos'.

git --everything-is-local

About

Documentation

Downloads

GUI Clients

Logos

Community

The entire [Pro Git book](#) written by Scott Chacon and Ben Straub is available to [read online for free](#). Dead tree versions are available on [Amazon.com](#).

Downloads

macOS Windows Linux/Unix

Older releases are available and the [Git source repository](#) is on GitHub.

GUI Clients

Git comes with built-in GUI tools ([git-gui](#), [gitk](#)), but there are several third-party tools for users looking for a platform-specific experience.

[View GUI Clients →](#)

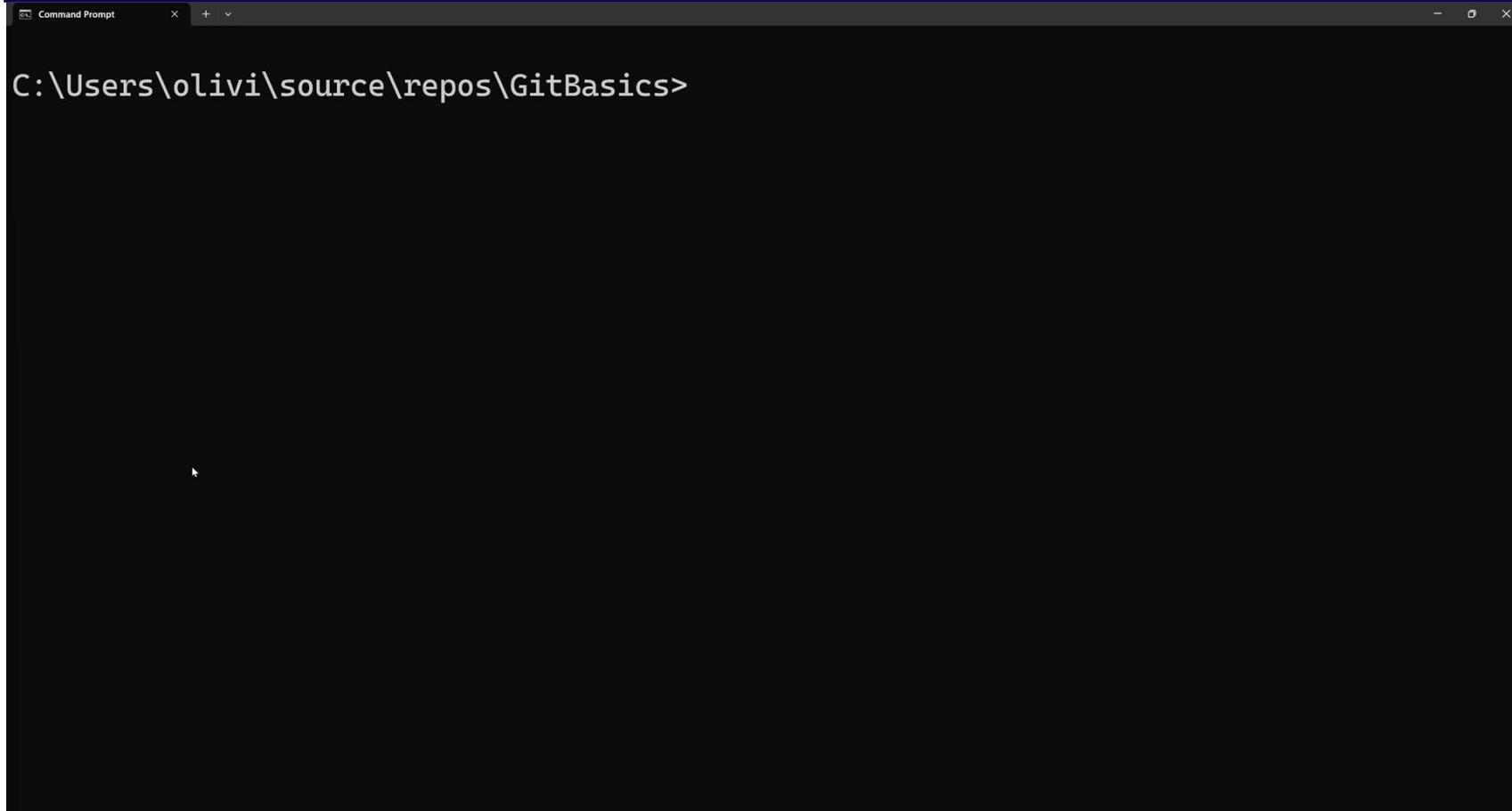
Logos

Various Git logos in PNG (bitmap) and EPS (vector) formats are available for use in online and print projects.

[View Logos →](#)

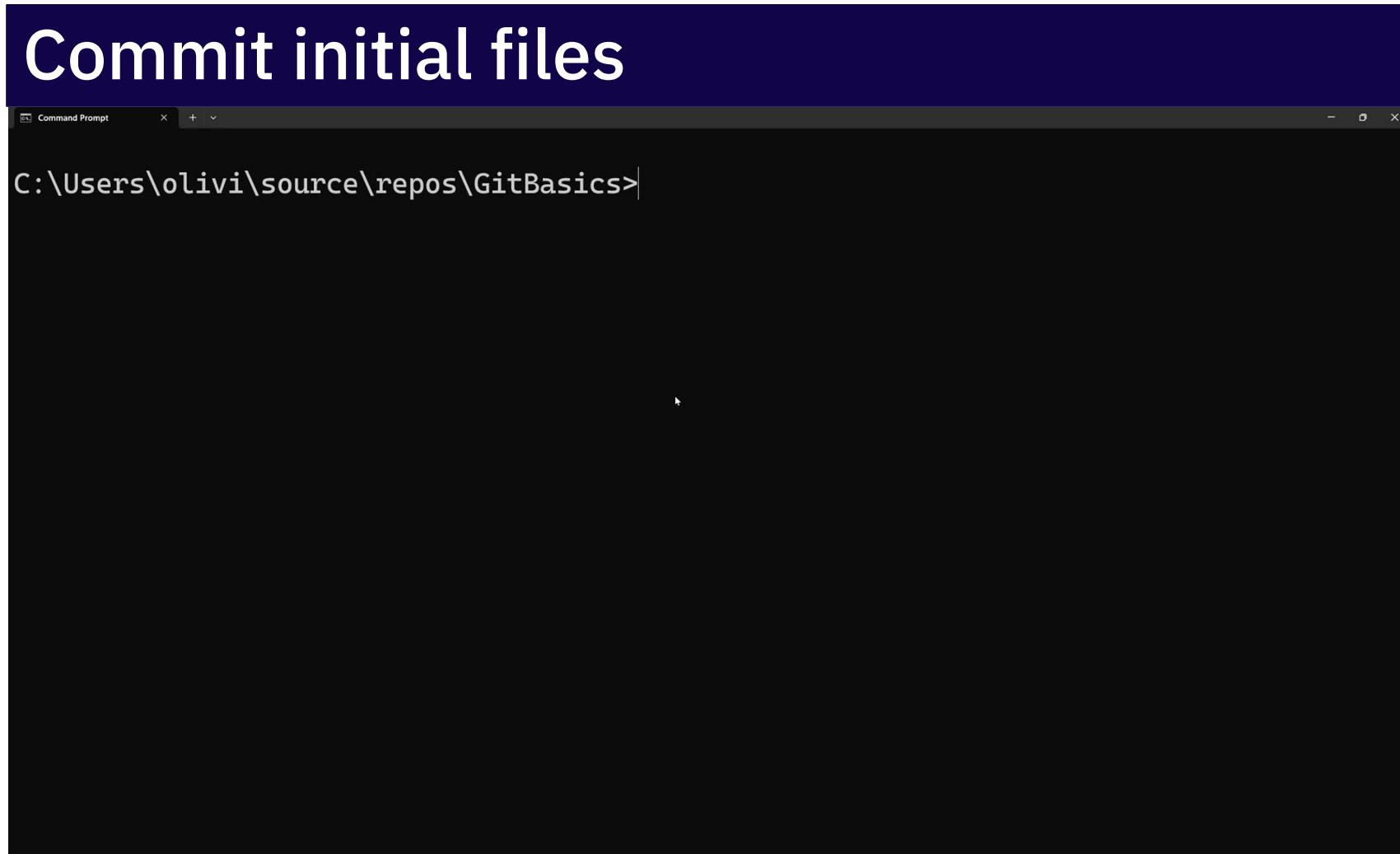
GIT Basics – Git Init

Create a new local Git Repository



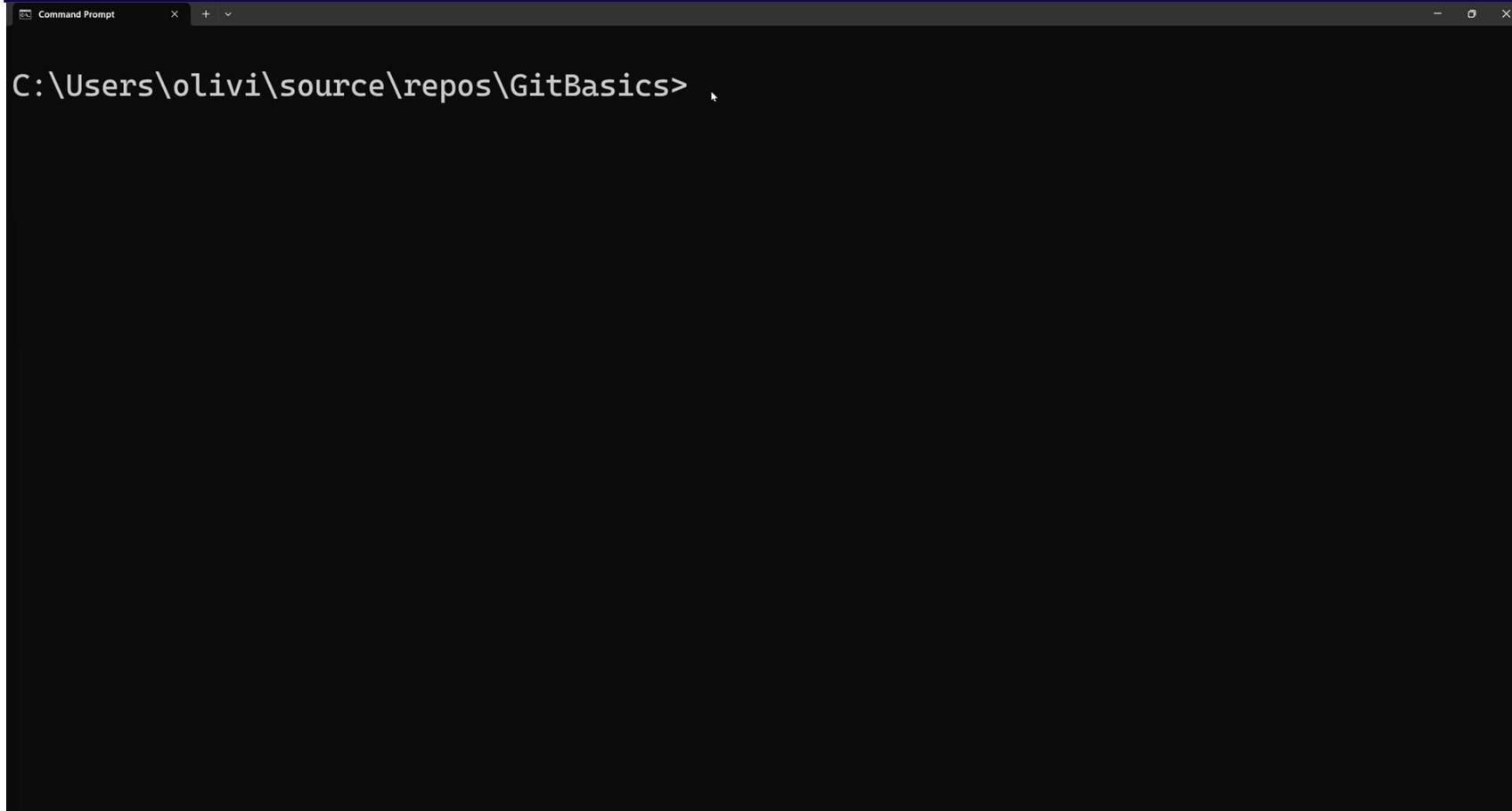
```
C:\Users\olivi\source\repos\GitBasics>
```

GIT Basics – Git Commit



GIT Basics – Git Remote

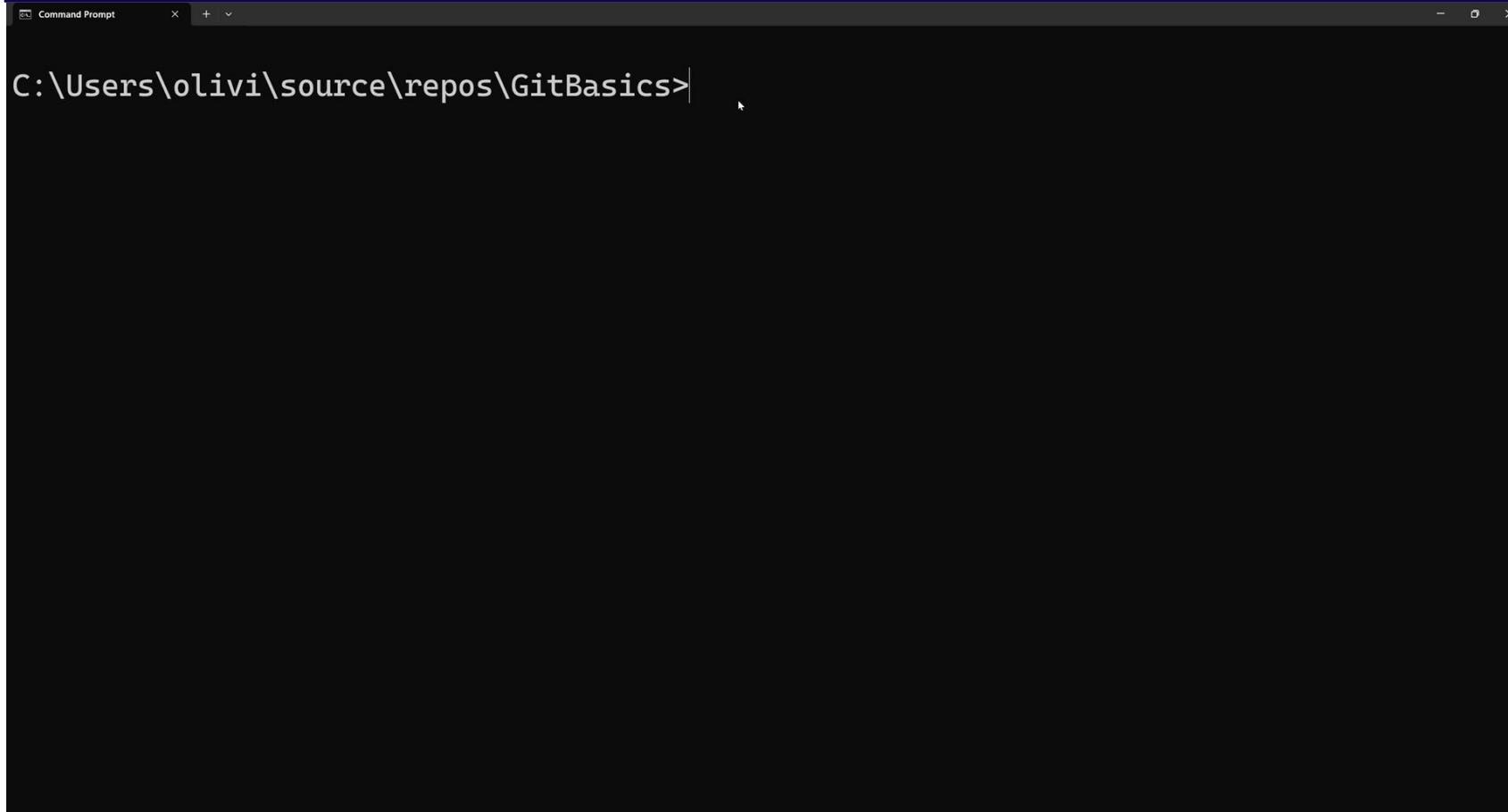
Add remote Git Destination



```
C:\Users\olivi\source\repos\GitBasics> .
```

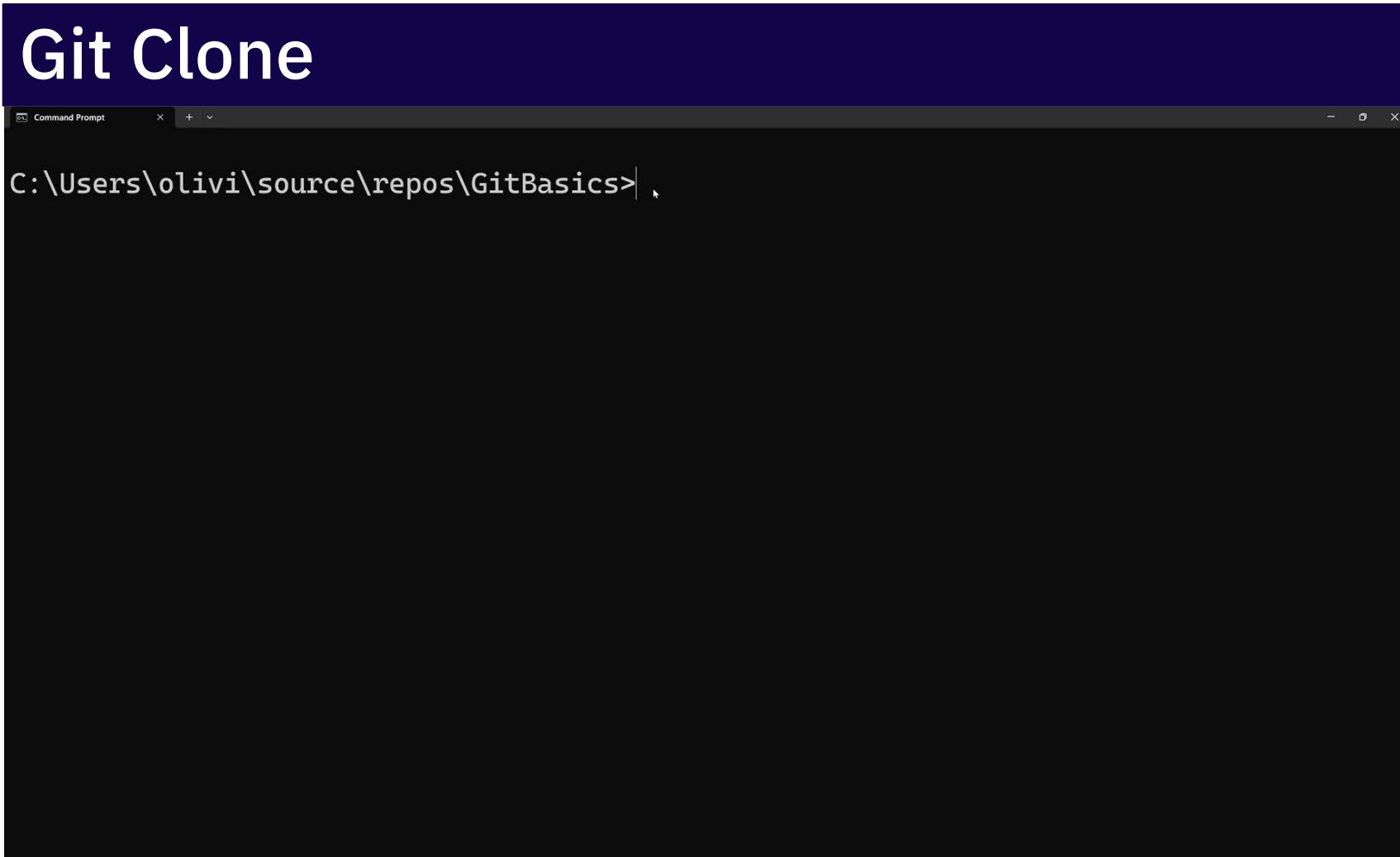
GIT Basics – Git Push

Push change to the remote



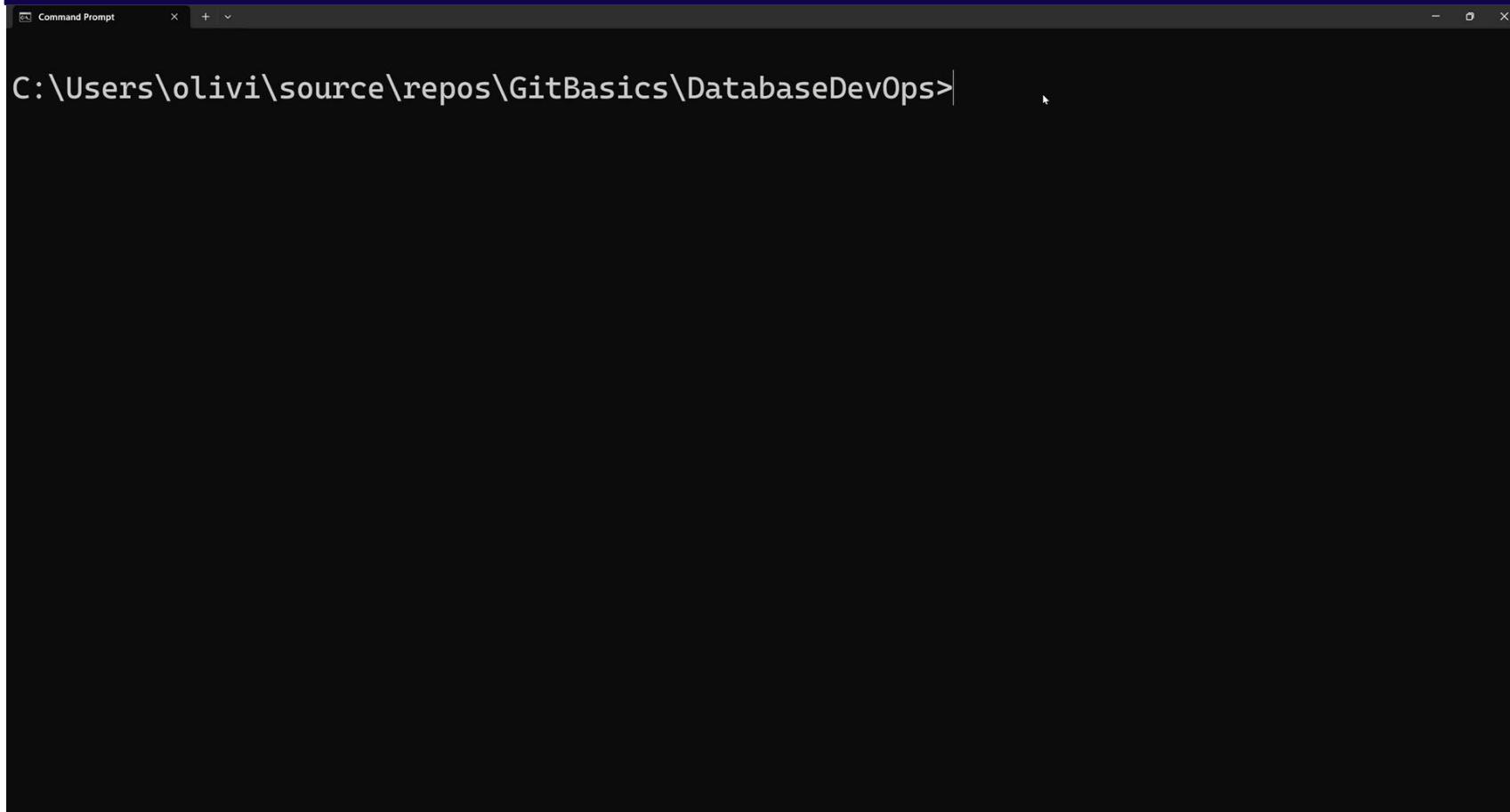
```
C:\Users\olivi\source\repos\GitBasics>
```

GIT Basics – Git Clone



GIT Basics – Git Branch

Create a new branch



```
C:\Users\olivi\source\repos\GitBasics\DatabaseDevOps>
```

GIT Basics – Git Pull

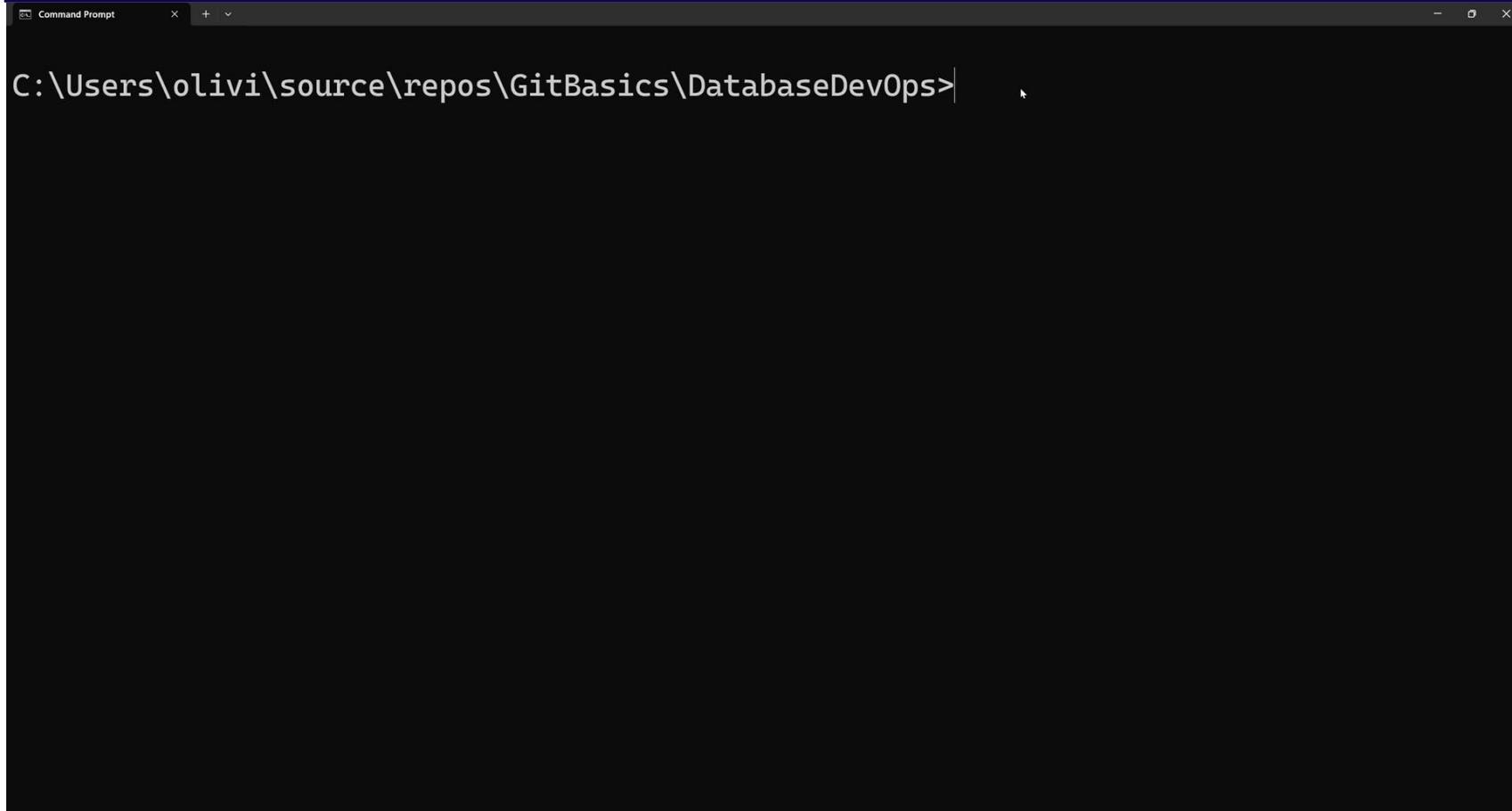
Getting all changes from the remote



```
C:\Users\olivi\source\repos\GitBasics\DatabaseDevOps>
```

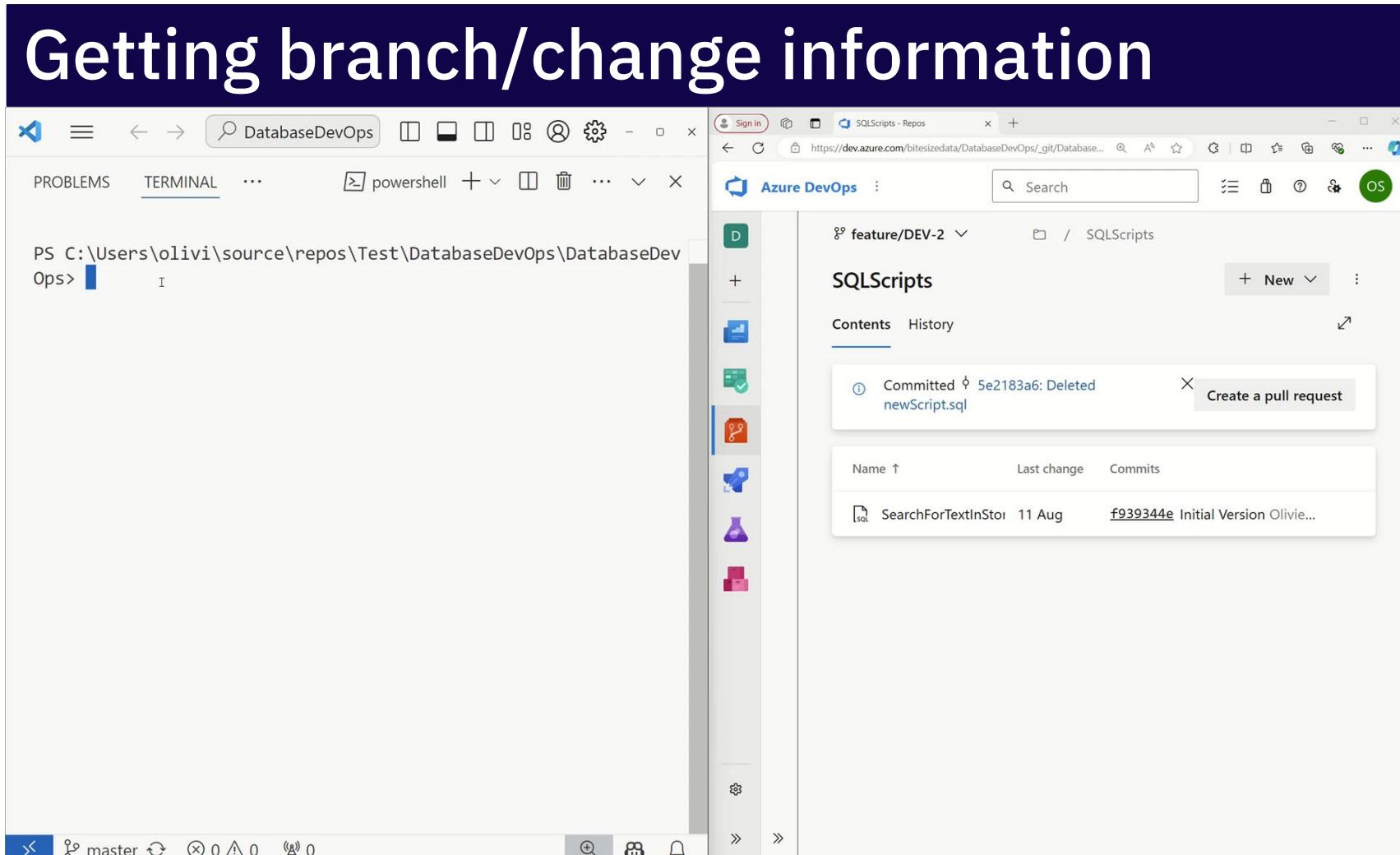
GIT Basics – Git Fetch

Getting branch/change information



A screenshot of a Windows Command Prompt window titled "Command Prompt". The window shows a single line of text at the top: "C:\Users\olivi\source\repos\GitBasics\DatabaseDevOps>". The rest of the window is blank, indicating no output has been displayed.

GIT Basics – Git Fetch



GIT Basics – GUI

Don't worry!

GUI's available

Visual Studio / VS Code / ...

SourceTree

GitHub Desktop

...

Branching strategies & Naming Conventions

Main and branches... what is in it?

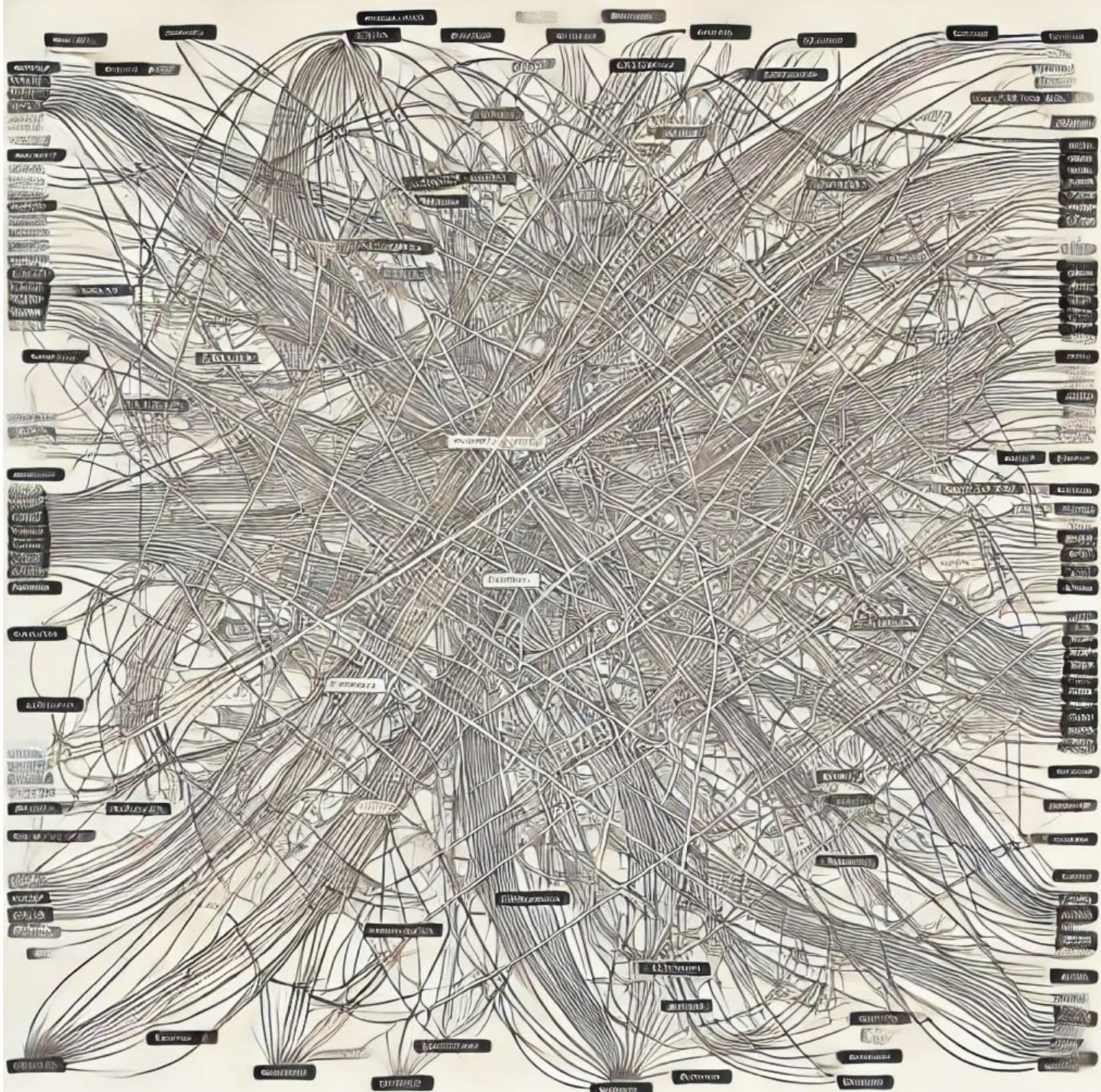
To start simple...

Trunk based development

- No branches, direct in *main*
- To protect *main*:
 - Make small change, frequent
 - Use Continuous Integration
 - Implement feature flags

Trunk based development

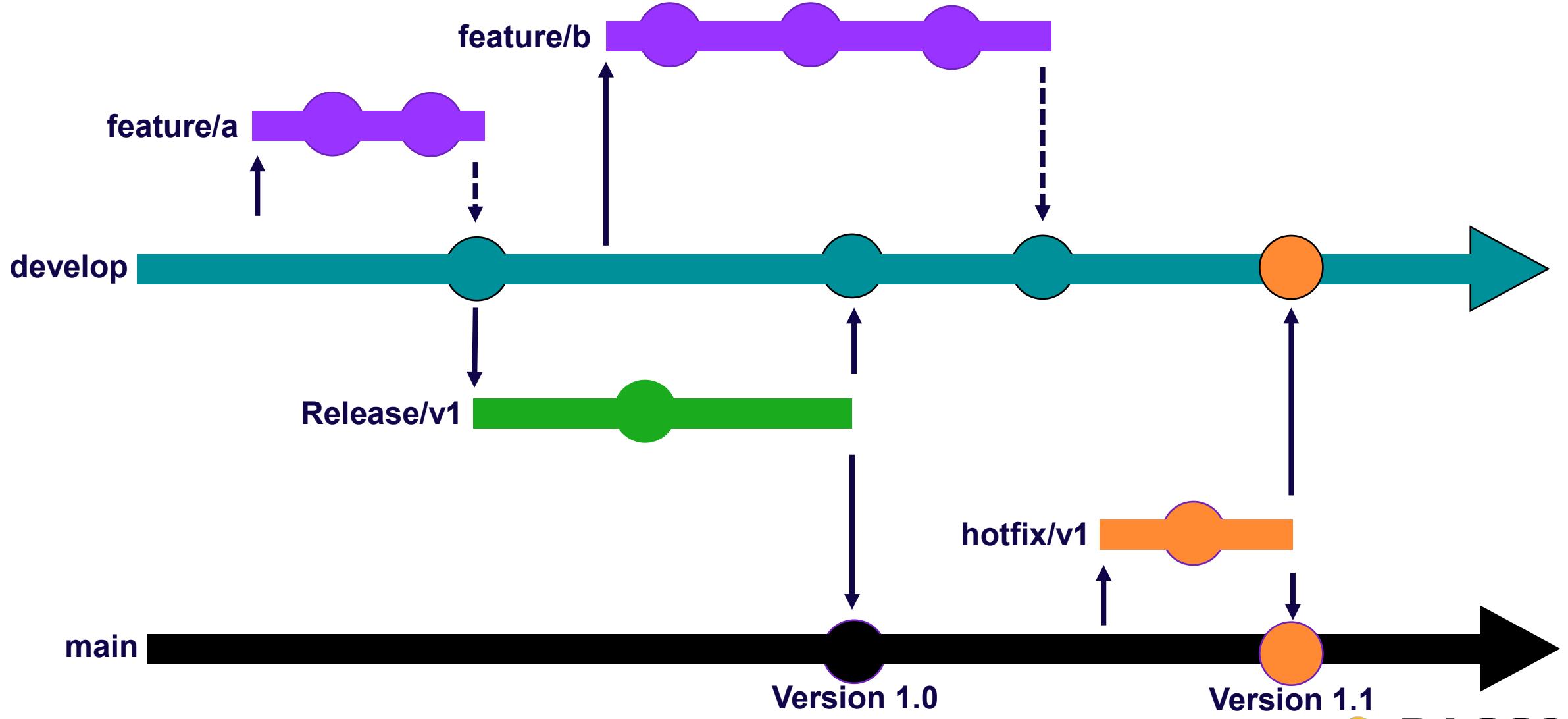




Git Flow

- Two long living branches:
 - Main – stable production-ready code
 - Develop – here all development takes place
- Short living branches: *feature*, *release*, and *hotfix*
- Merge *release*, *hotfix* back in *main* and *develop*

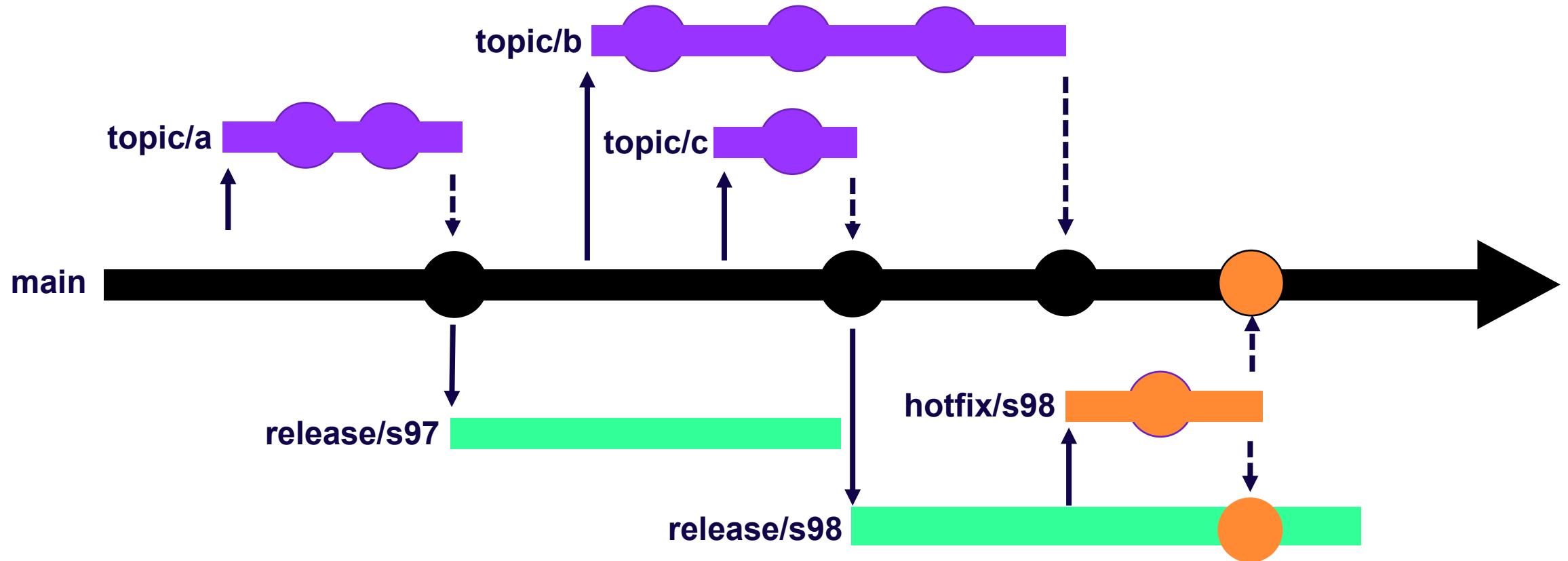
Git flow in action



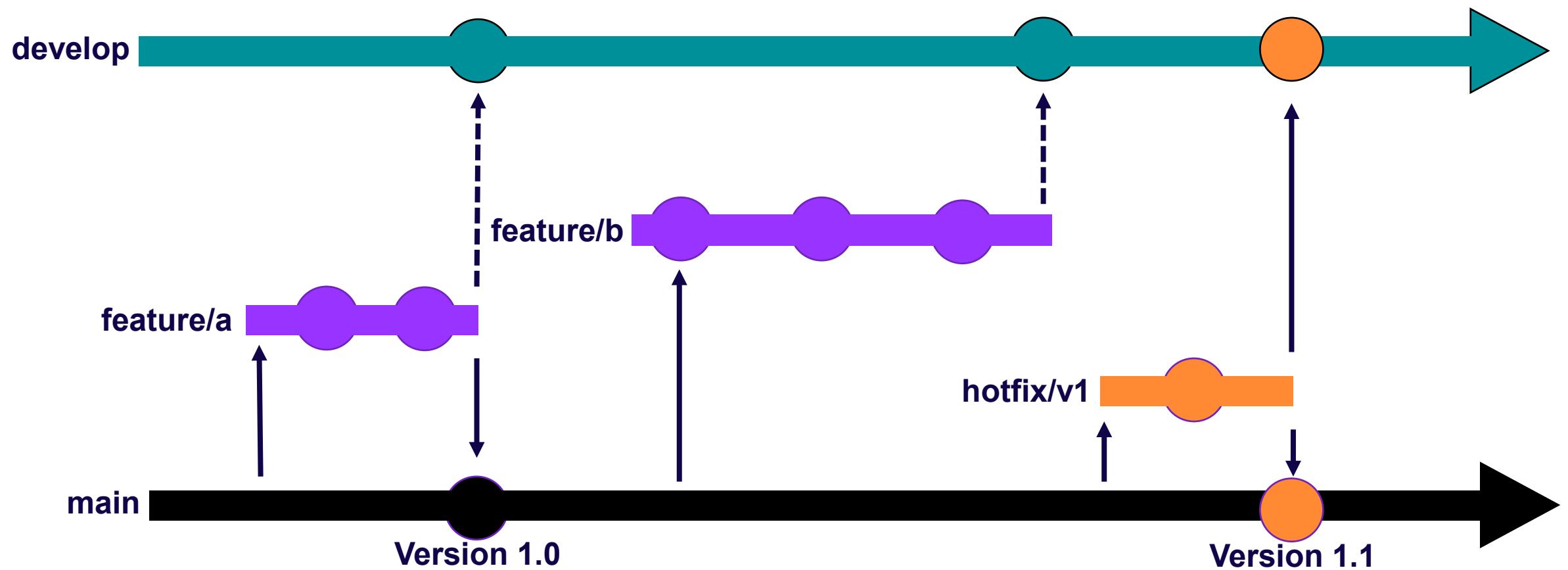
Release flow

- Short living *topics*
- *Main* branch always in *release* state
- *Hotfix* the *release*, cherry pick *main*

Release flow in action



Git without release flow in action



Create a branch naming convention

Topic / hotfix

<branch category>/<hot fixed release>-<ExternalId>-PascalCasingDescription

hotfix/s100-mms12220-FireFighting

topic/mms12345-MyDescription

Release branch

<branch category>/<unique identification>

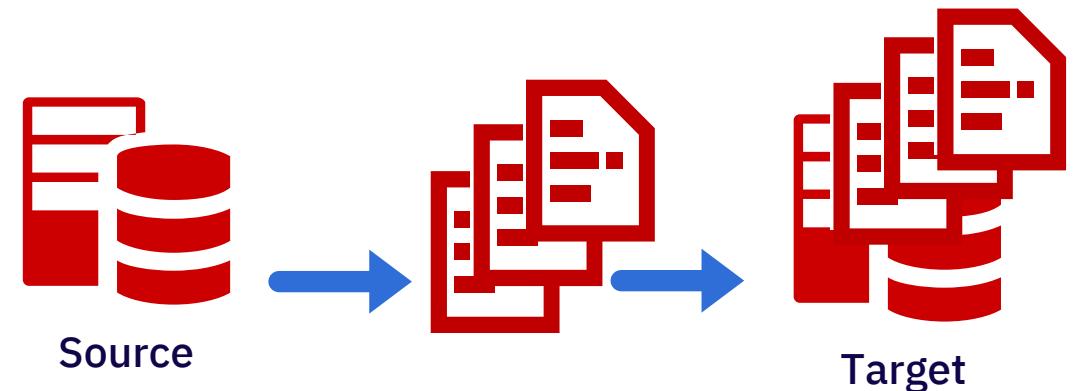
release/s100

State vs Migrate

The basics

Types of migrations

- State based
 - Comparing Source to Target
- Migrations based:
 - Baseline: The starting point
 - Generate subsequent migrations from this baseline



State-Based Initial Setup

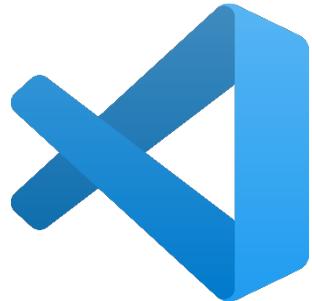
SSDT / Database Projects

Initial Setup

Which tool to use?



Visual Studio

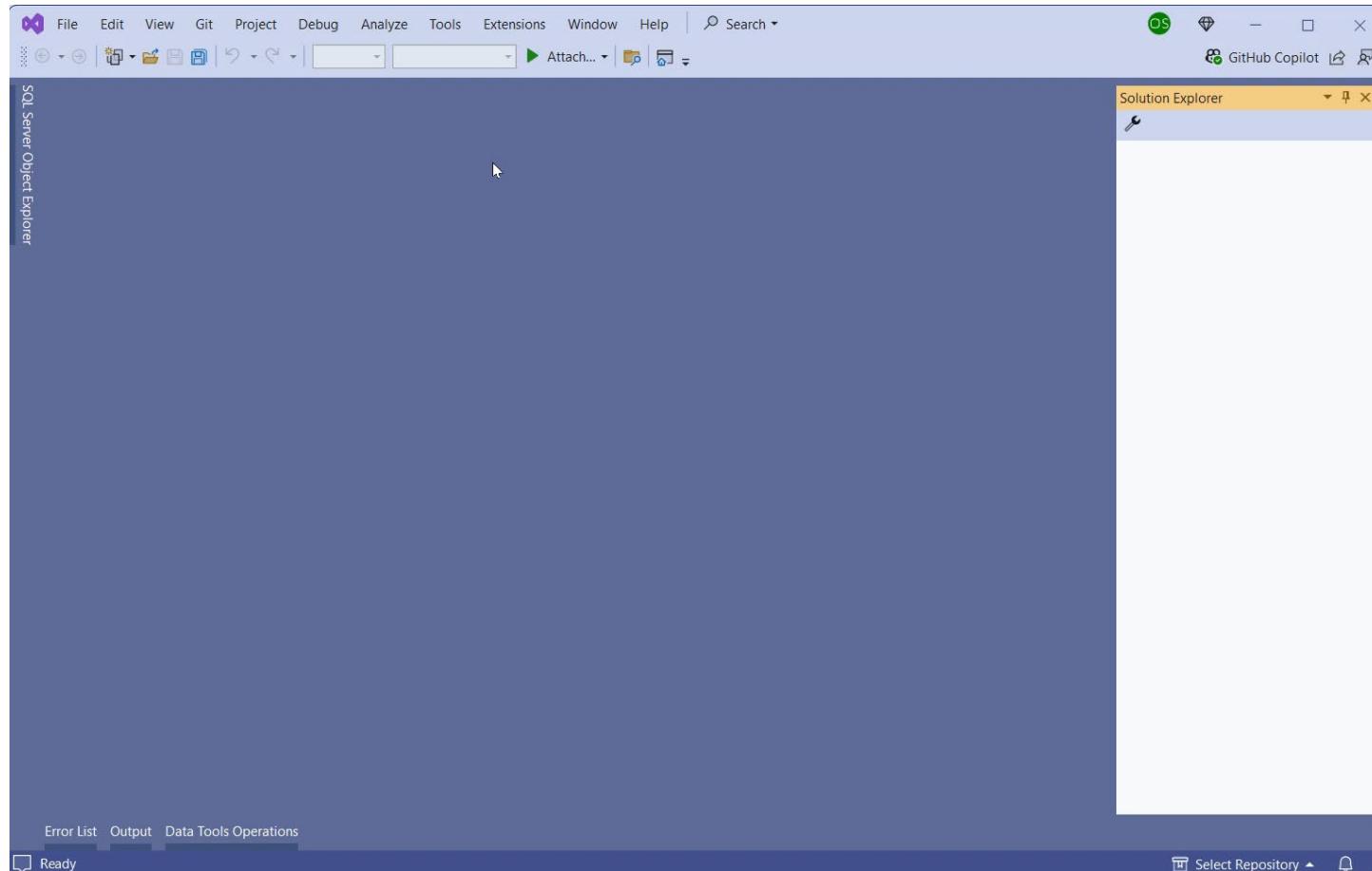


Visual Studio
Code

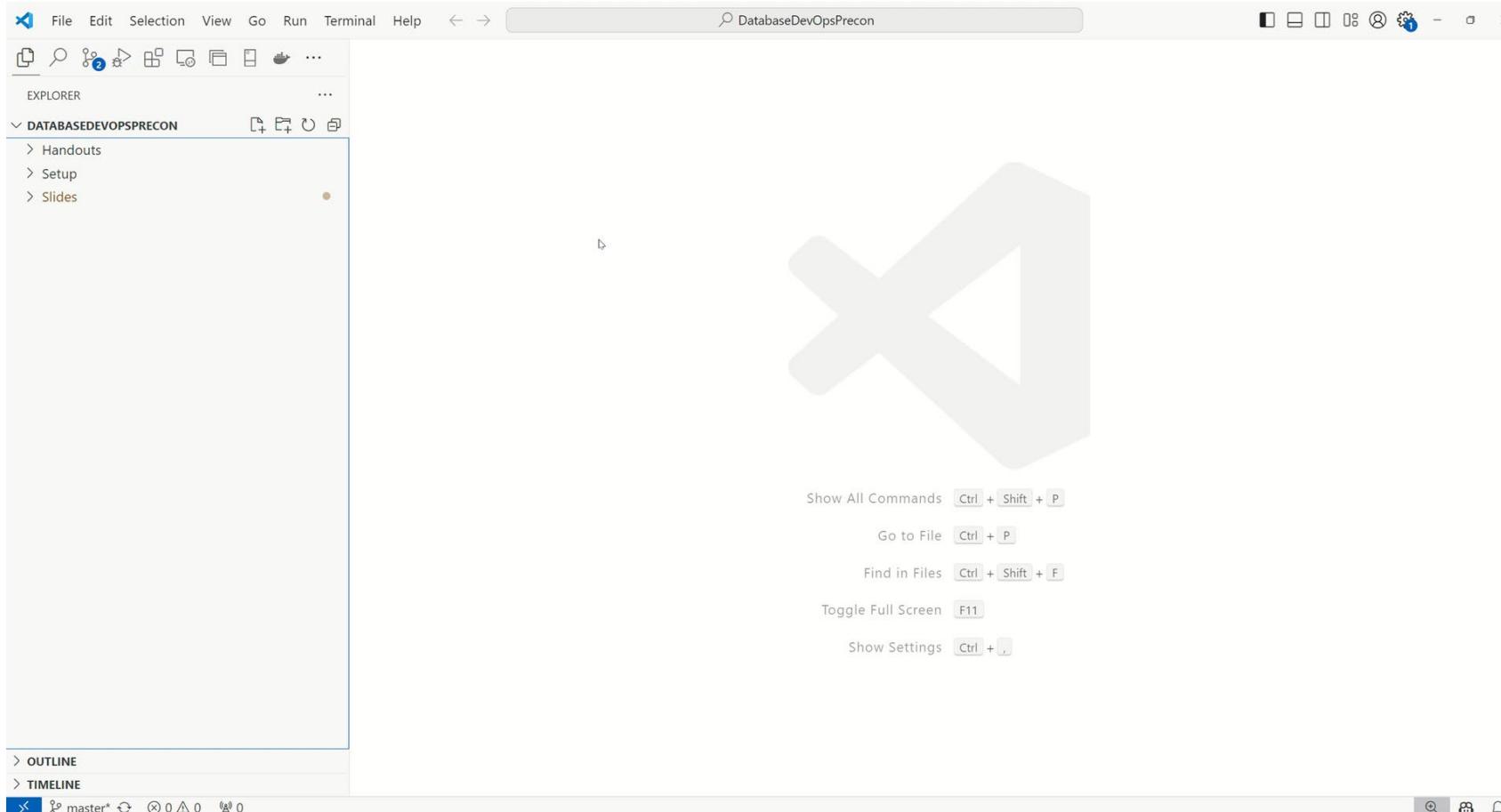


Azure Data
Studio

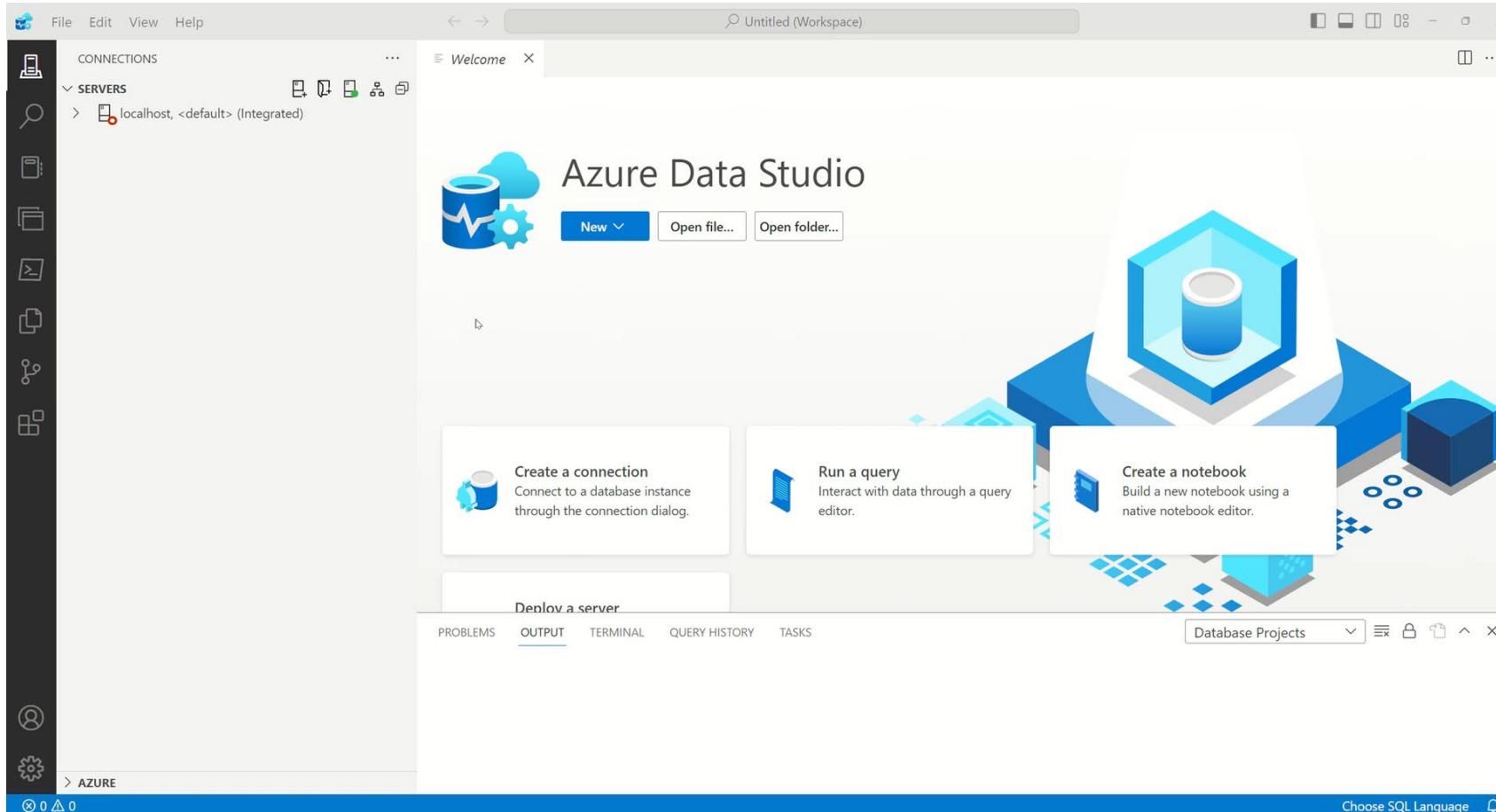
Visual Studio – Extension



Visual Studio Code – Extension



Azure Data Studio – Extension



Important to know

Available for

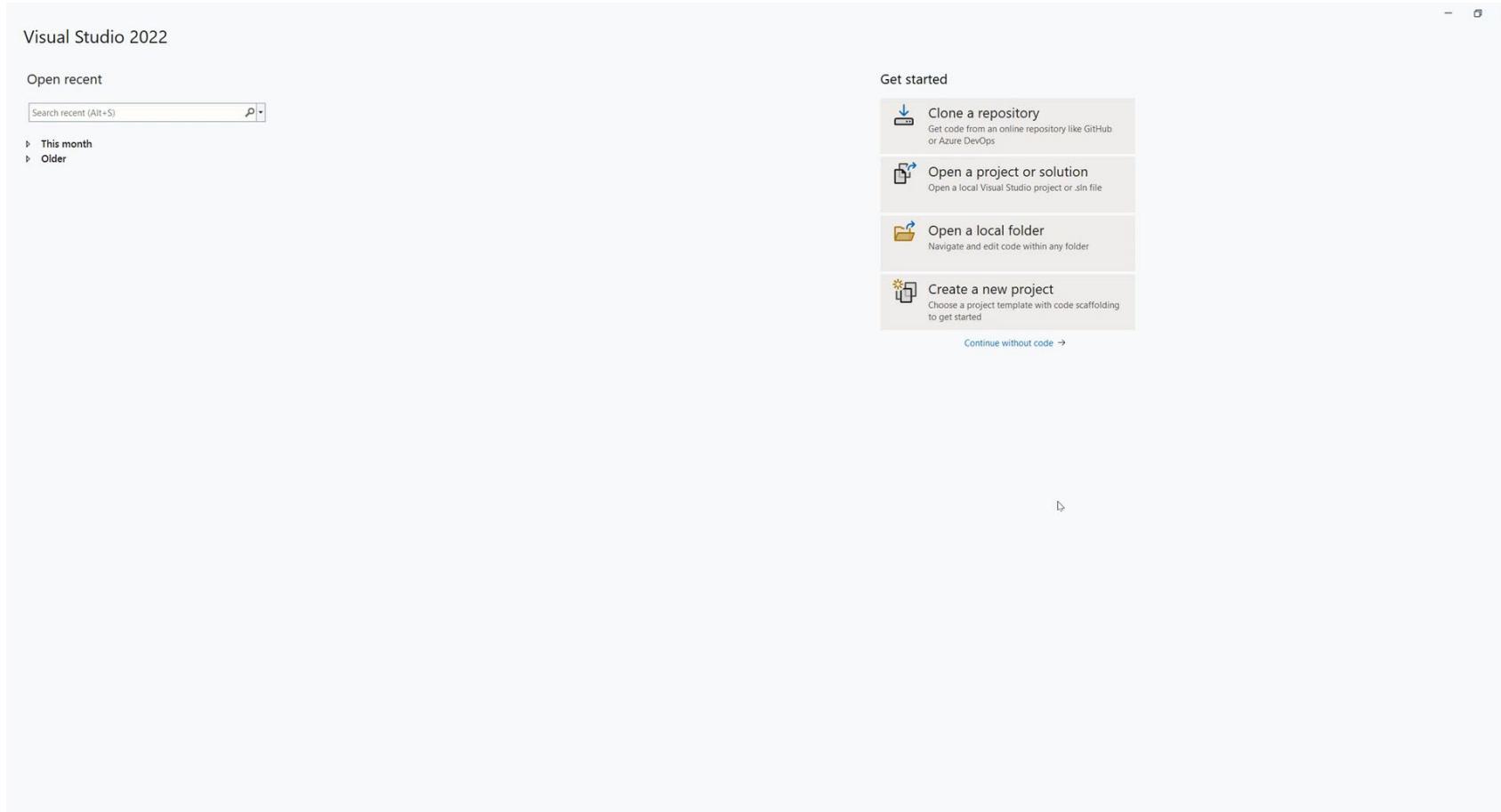
SQL Server (*)

Azure SQL (MI)

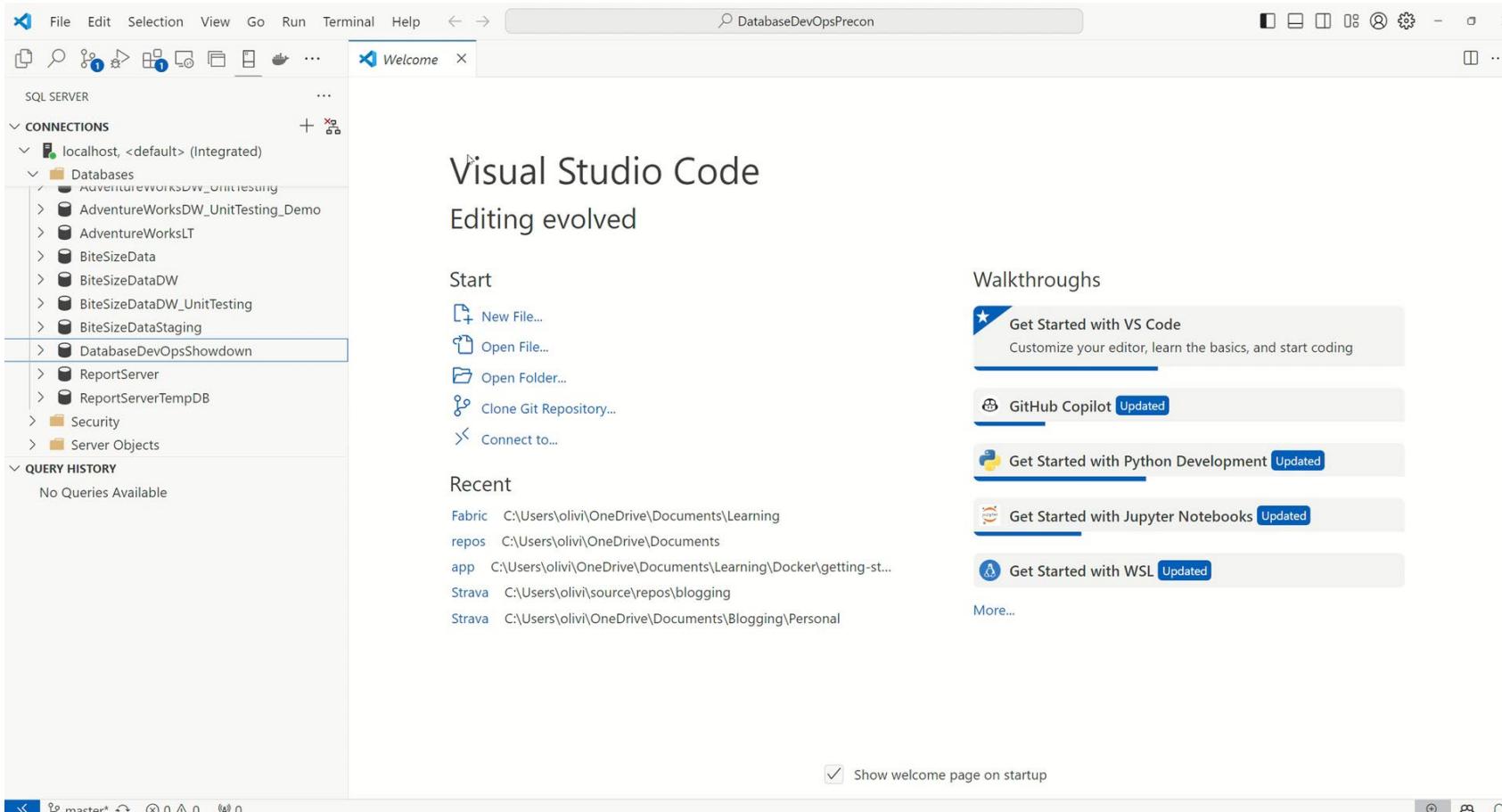
Azure Synapse Analytics

Microsoft Fabric

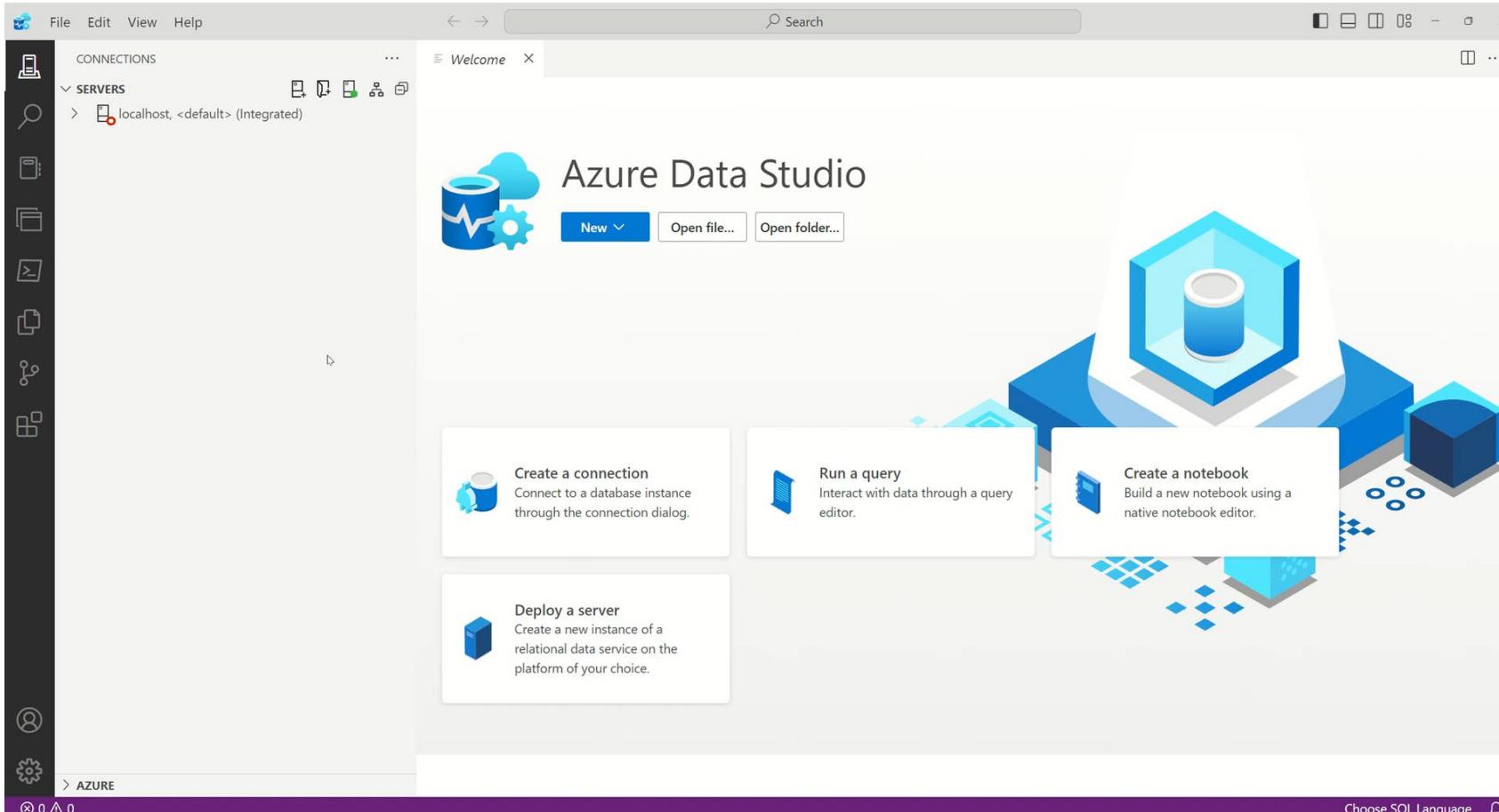
Initializing your first Database Project (Visual Studio)



Initializing your first Database Project (Visual Studio Code)



Initializing your first Database Project (Azure Data Studio)



Personal Recommendation

Visual Studio

Most elaborate functionalities

Most User friendly

What happens behind the scenes?

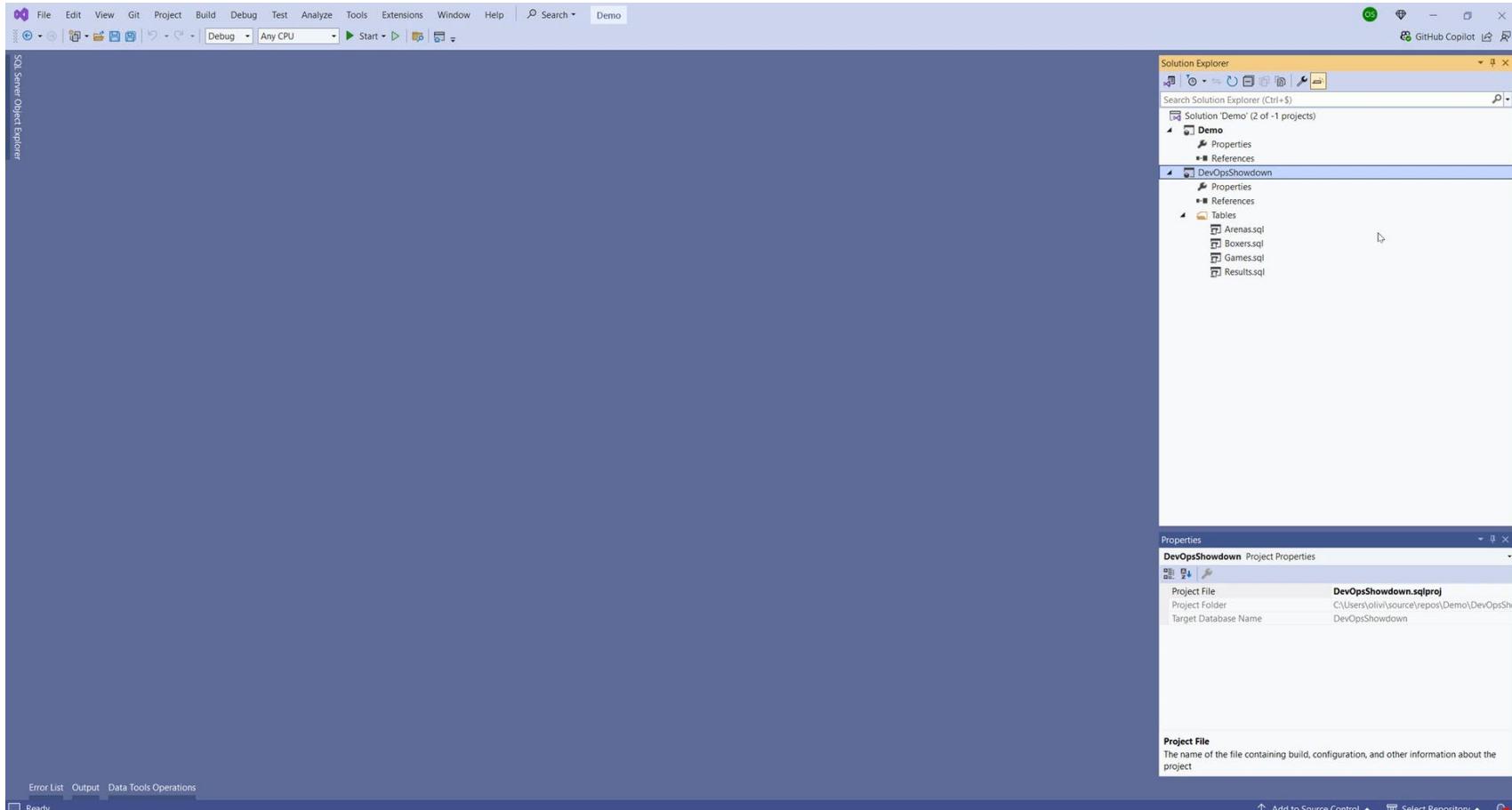
.sqlproj file

configuration of folders/files

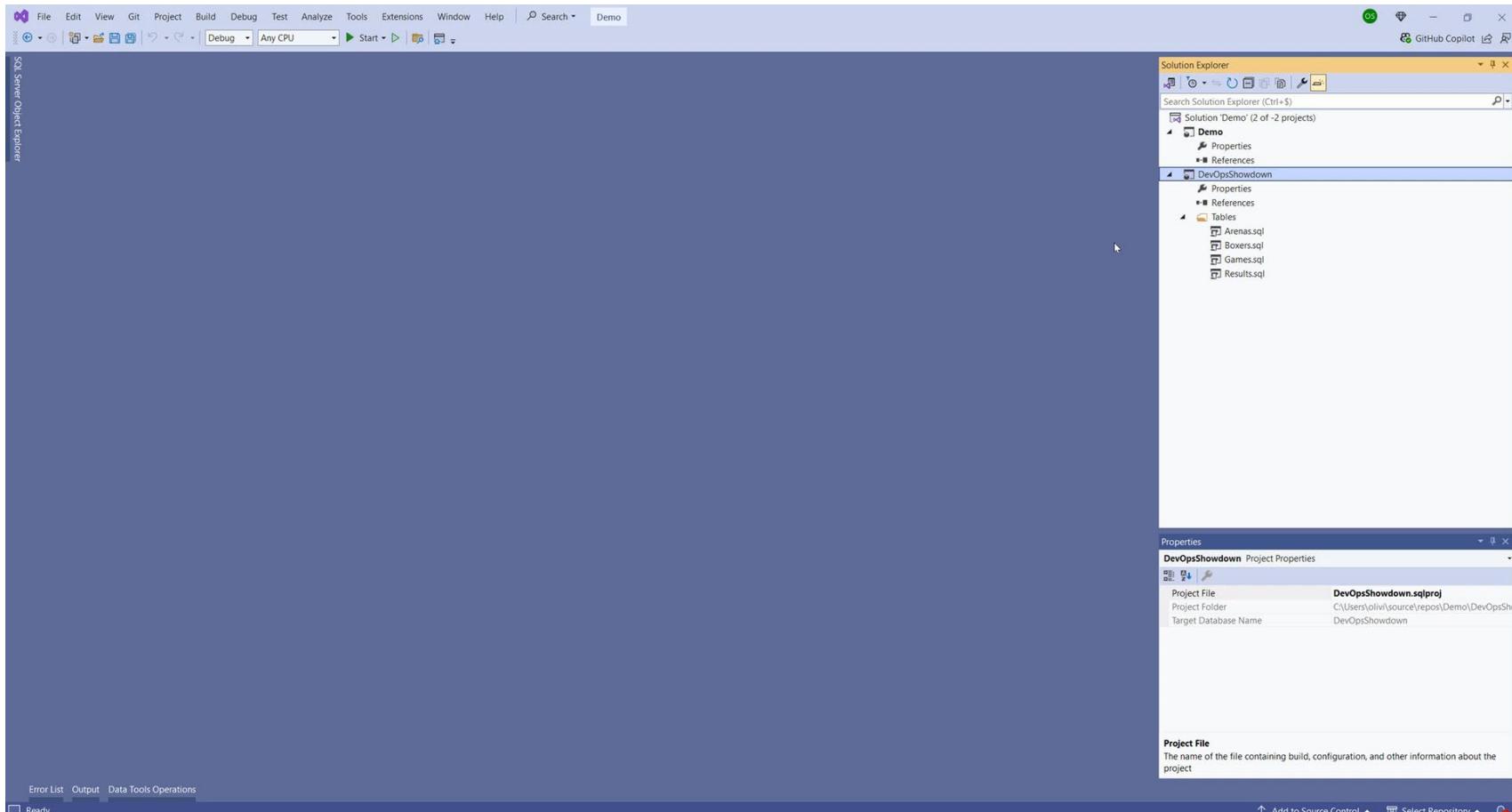
.sln (Visual Studio Only)

grouping of Database Projects

.sqlproj file



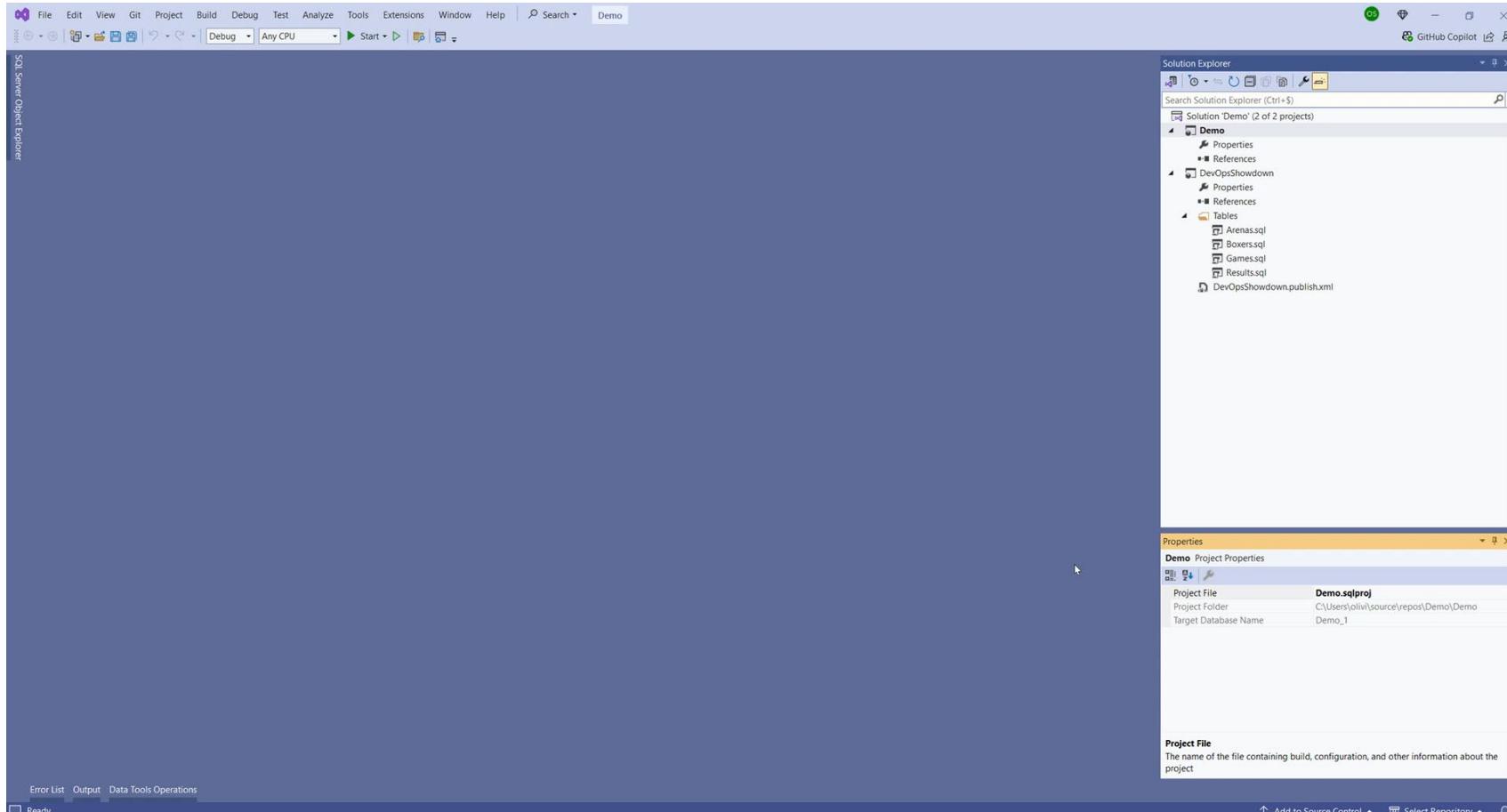
.sqlproj file



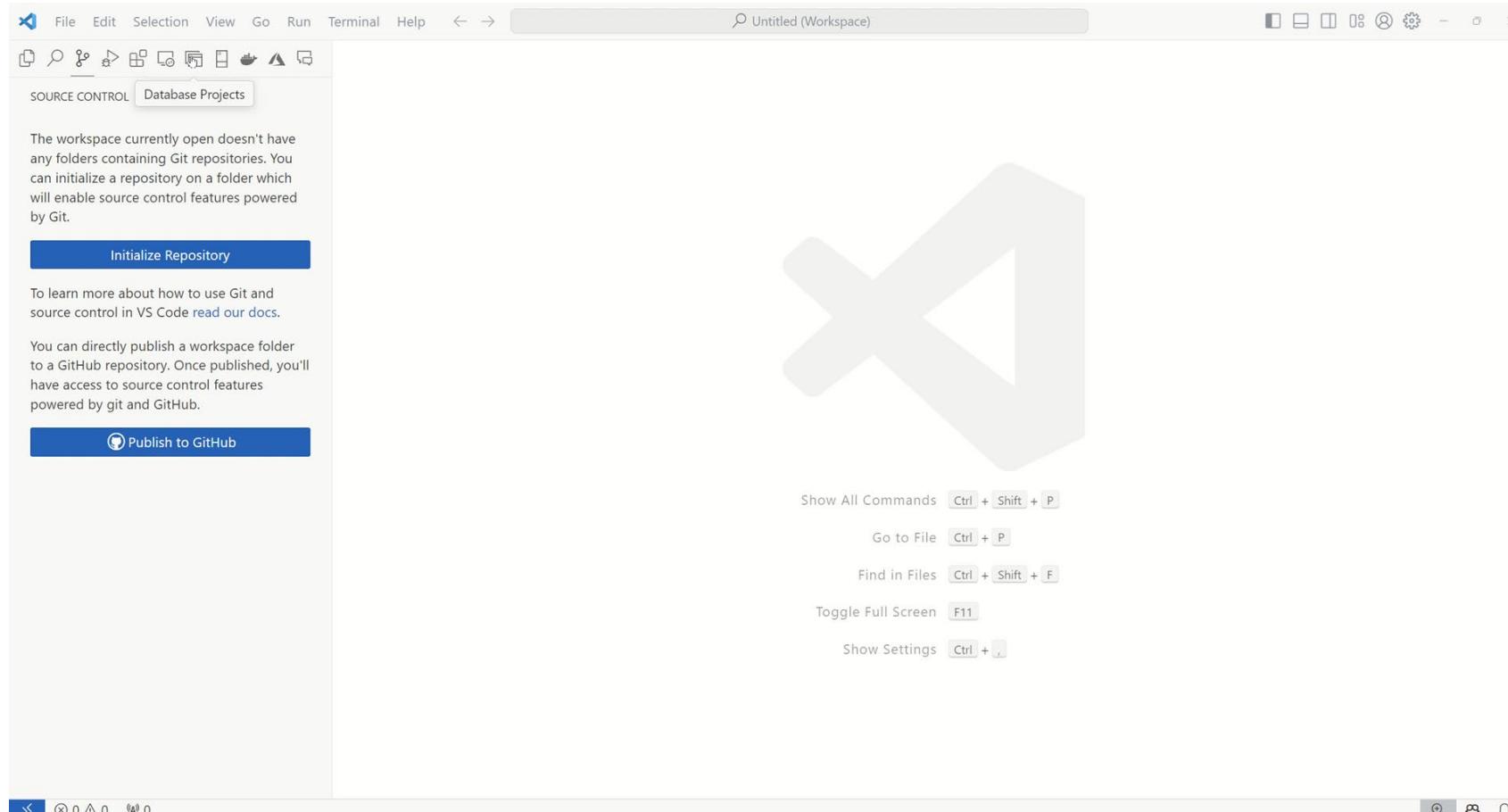
.sqlproj file

- Only a few reasons to intervene in the sqlproj file yourself
- Example: Advanced configuration for Unit Testing

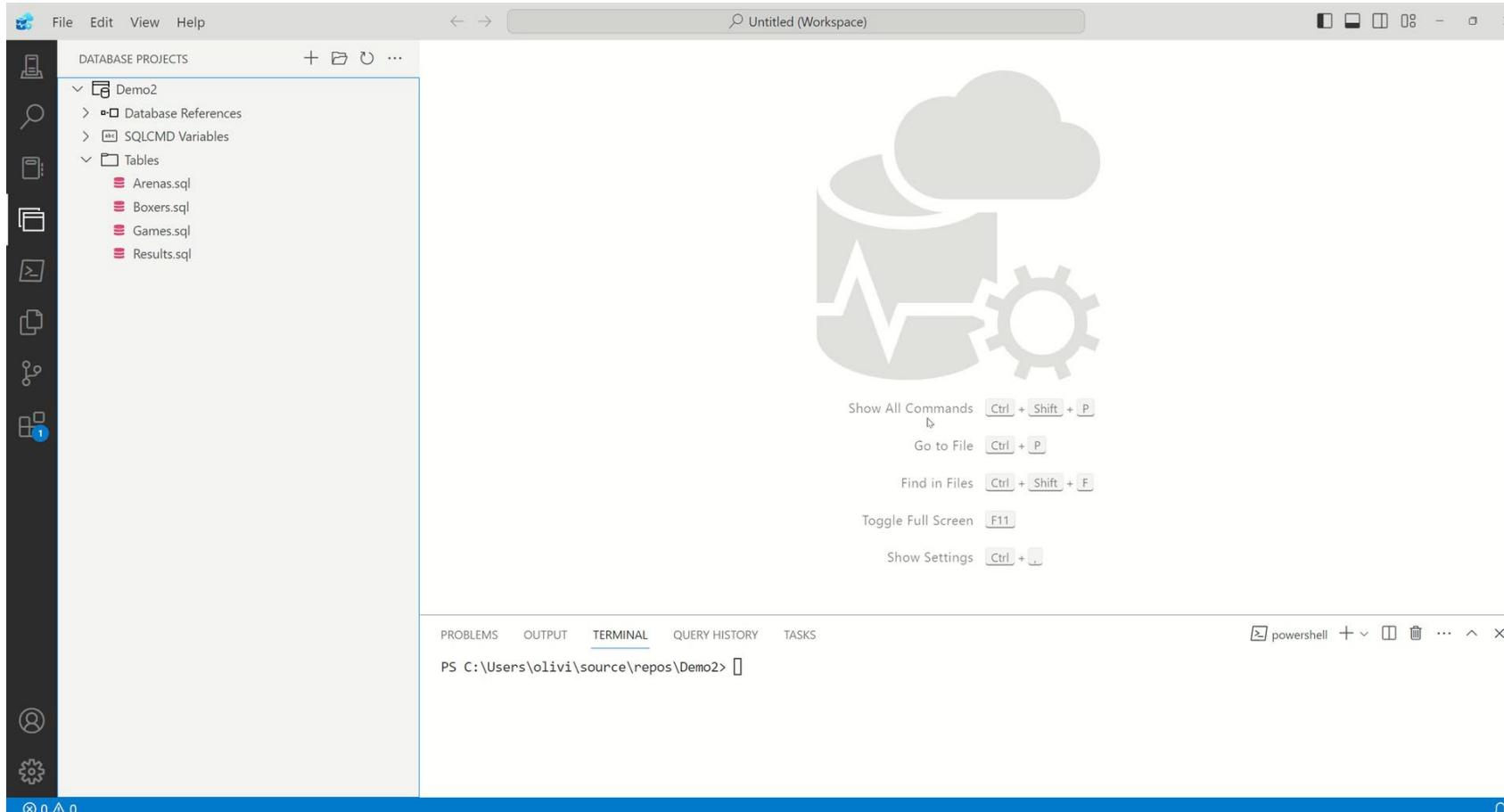
Making our Database Project Available – Visual Studio



Making our Database Project Available – Visual Studio Code



Making our Database Project Available – Azure Data Studio



Migration-Based

Initial Setup

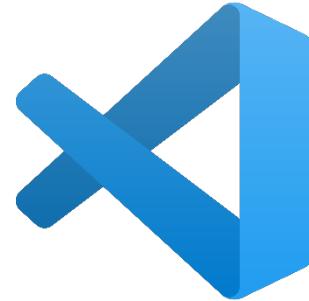
Flyway / Grate / EF core Initial Setup

Which tool to use?

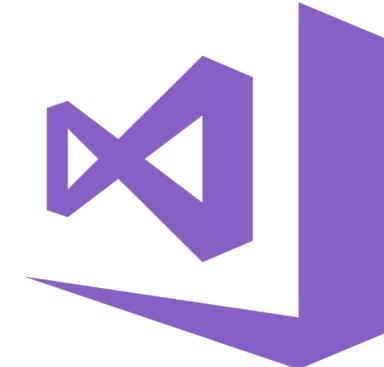


Flyway

Community
Enterprise



Visual Studio
Code

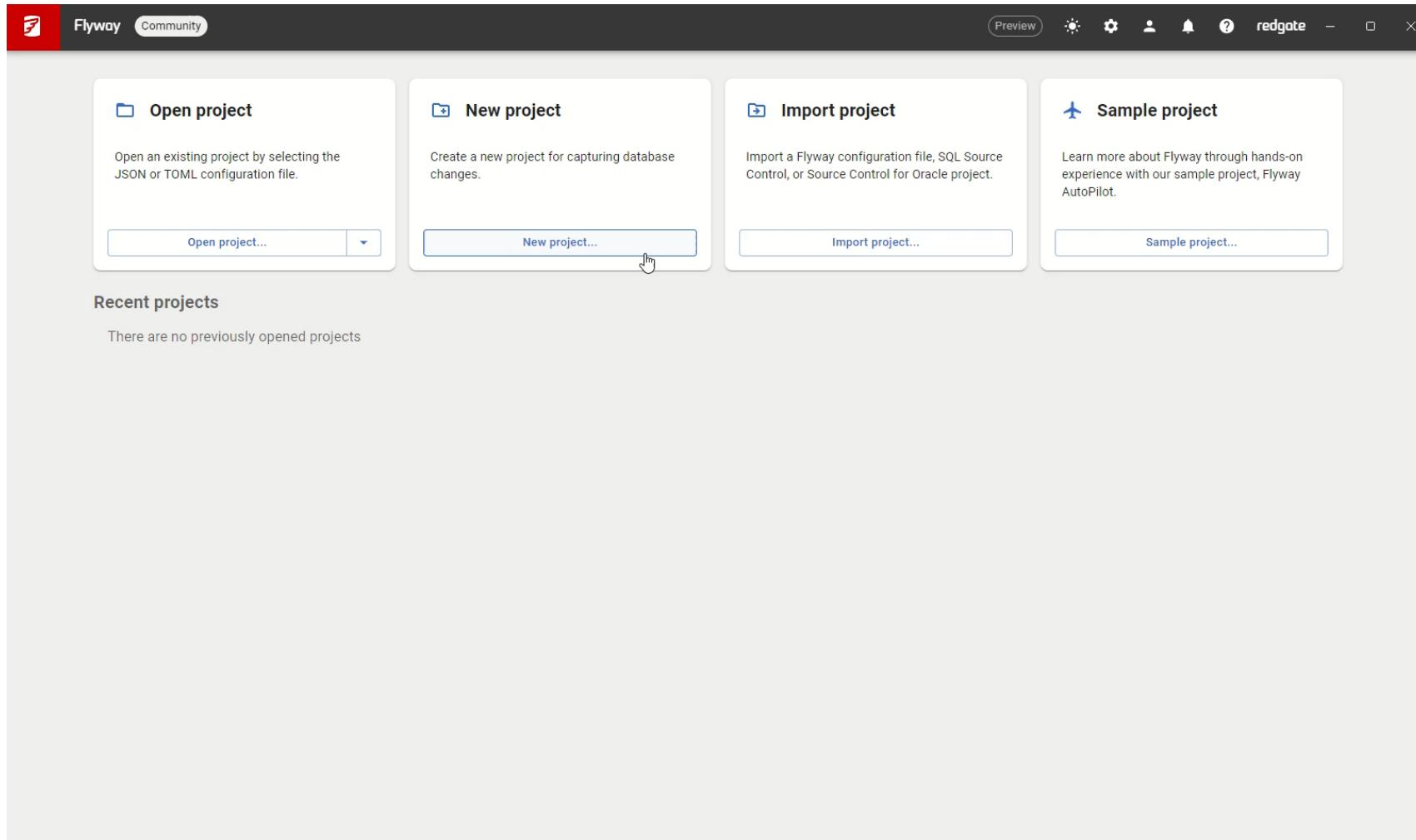


Visual Studio

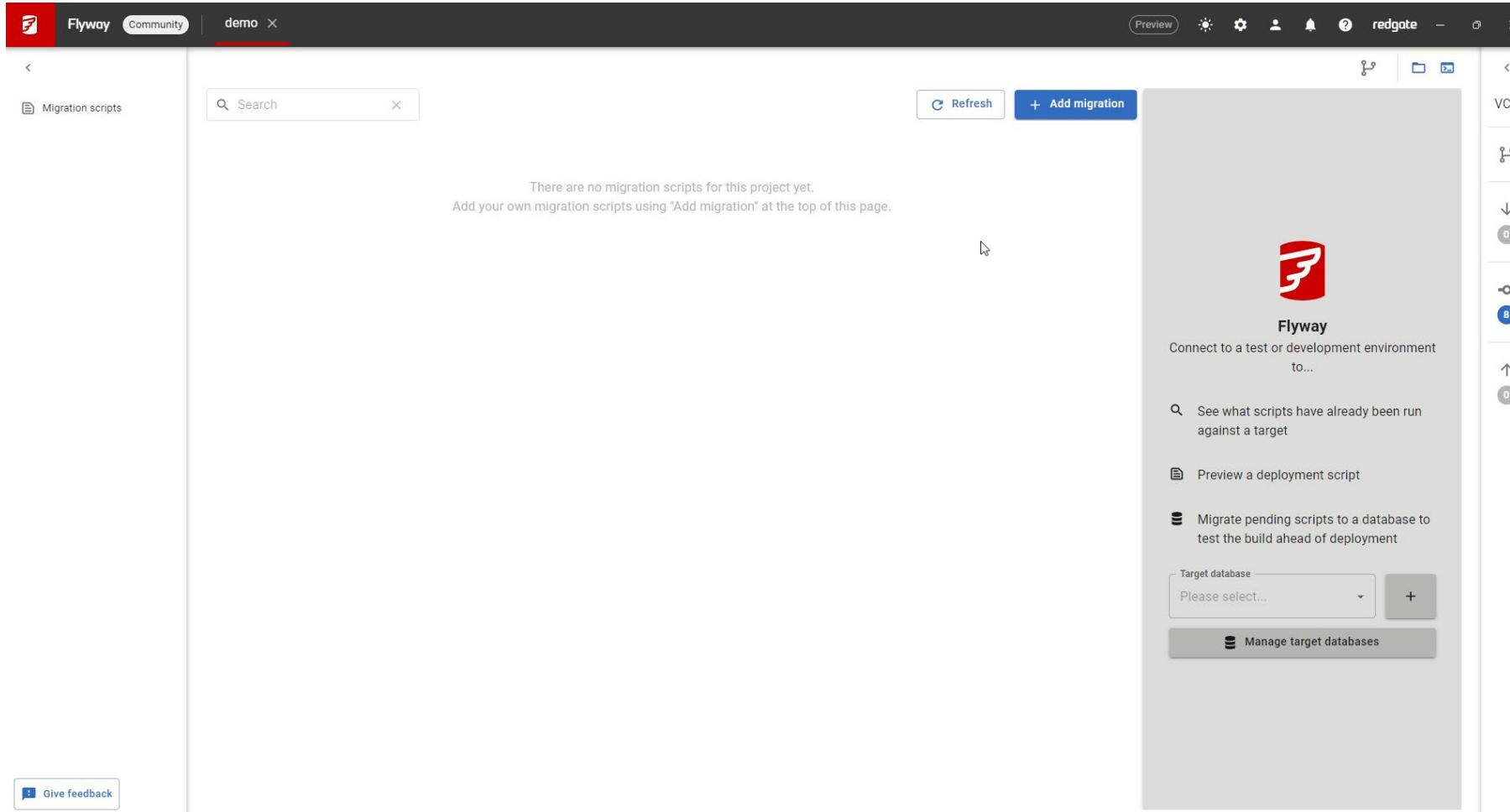
Entity Framework



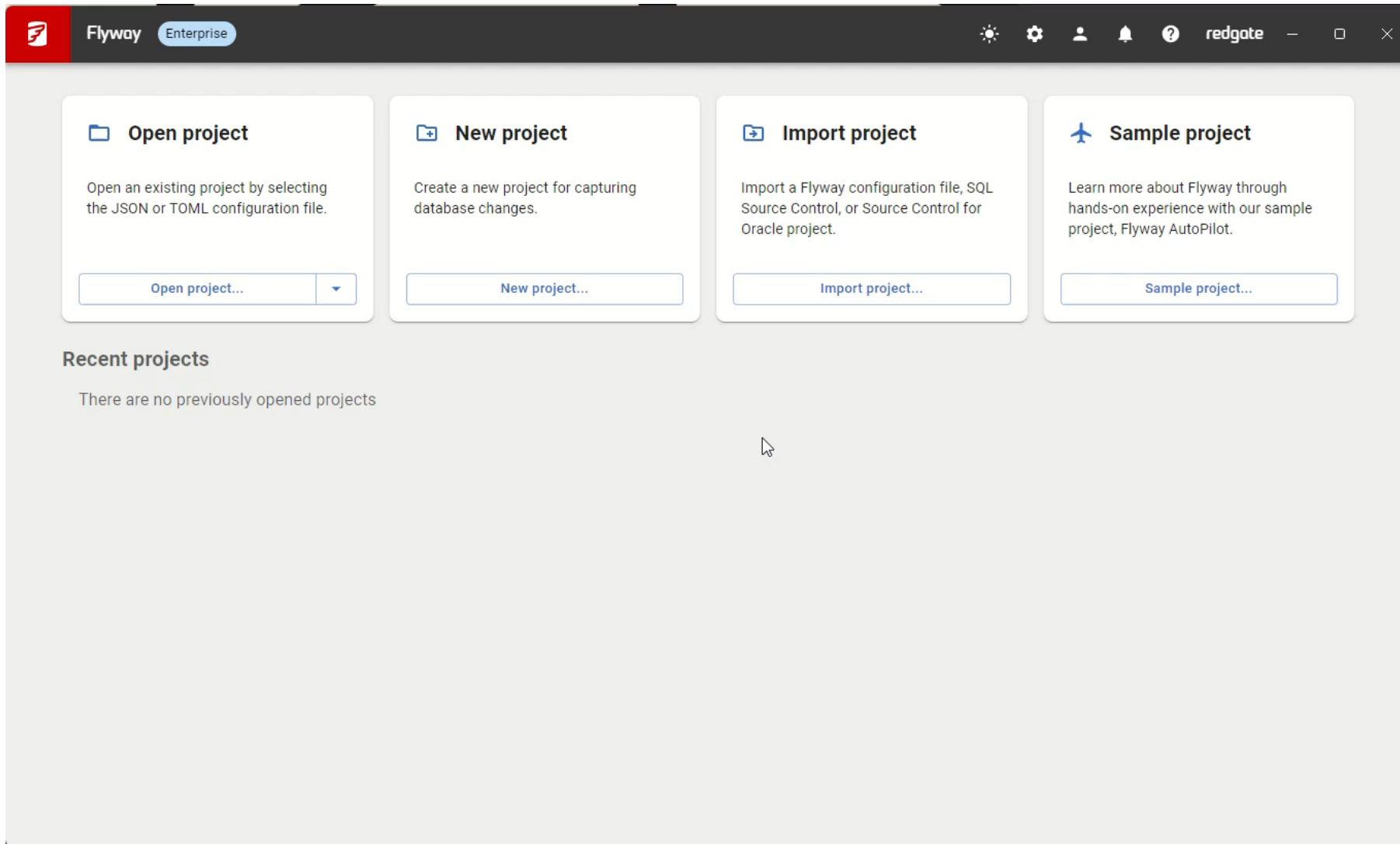
Initializing your first Flyway Desktop Project (Community)



Initializing your first Flyway Desktop Project (Community)



Initializing your first Flyway Desktop Project (Ent.)



Initializing your first Flyway Desktop Project (Ent.)

The screenshot shows the Flyway Desktop application interface. The title bar indicates the project is "devopsshowdown_ent". The left sidebar has three main items: "Schema model" (selected), "Generate migrations", and "Migration scripts". The main panel displays a table of objects in the schema model:

Object name	Change type	Object type	Schema
Arenas	Create	Table	dbo
Boxers	Create	Table	dbo
Games	Create	Table	dbo
Results	Create	Table	dbo

At the bottom of the main panel, there are buttons for "Give feedback", "Development database", and "Schema model". The status bar at the bottom right shows "redgate" and "Data Community Summit".

Initializing your first Flyway Desktop Project (Ent.)

The screenshot shows the Flyway Desktop application interface. The title bar indicates it's an Enterprise edition for the project "devopsshowdown_ent". The left sidebar has two main items: "Schema model" (selected) and "Migration scripts". The main area is titled "Static data & comparisons" and contains a search bar, a radio button for "Save to project" (selected), and a "Refresh" button. It also shows a message "Updated a few seconds ago". Below this, there's a table with four rows:

Object name	Change type	Object type	Schema
Arenas	+ Create	Table	dbo
Boxers	+ Create	Table	dbo
Games	+ Create	Table	dbo

At the bottom, there are buttons for "Give feedback", "Development database", and "Schema model".

Initializing your first Flyway Desktop Project (Ent.)

The screenshot shows the Flyway Desktop application window. The title bar includes the Flyway logo, 'Enterprise' status, and the project name 'devopsshowdown_ent'. The left sidebar has tabs for 'Schema model' (selected), 'Generate migrations', and 'Migration scripts'. The main area has a search bar, a toolbar with 'Refresh' and 'Generate scripts' buttons, and a message about not having created a baseline yet. It also shows a table header for 'Object name', 'Change type', and 'Object type'. A message at the bottom says 'No changes found'. A central call-to-action button says 'Generate scripts from your schema model'.

Flyway Enterprise

devopsshowdown_ent

Schema model

Generate migrations

Migration scripts

Search

Refresh

Generate scripts

You haven't created a baseline yet.

For existing databases, we recommend creating a baseline script that reflects the state of your objects that have already been deployed so that you can generate new migrations from this point.

Create baseline...

No changes found

Generate scripts from your schema model

Refresh to check for any schema model changes that haven't been captured as a migration script.

Give feedback

Schema model → Migrations

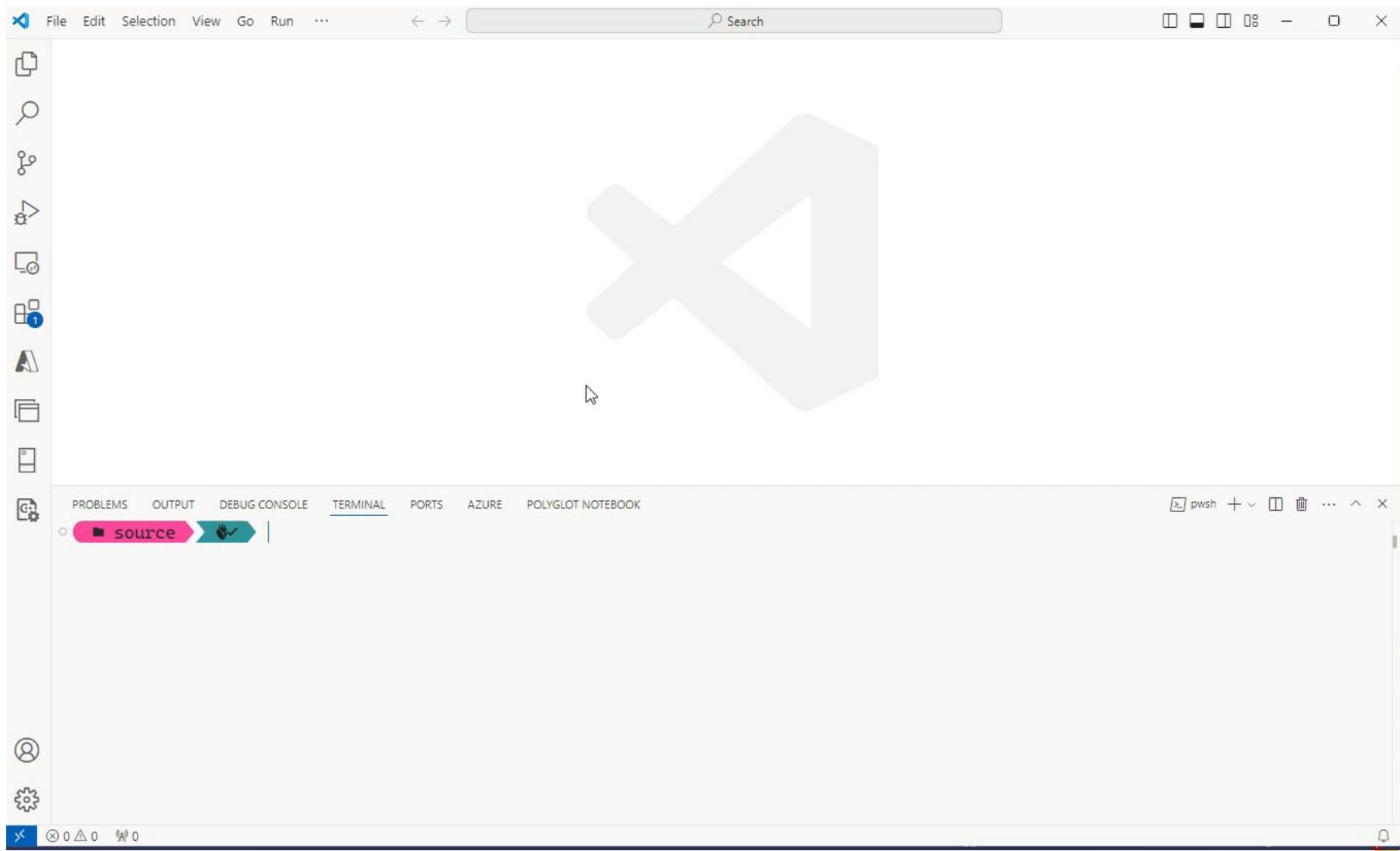
Important to know

Available for (features differ per edition):

- SQL Server
- PostgreSQL
- Oracle
- MariaDB/MySQL
- Sqlite
- Snowflake
- DB2
- MongoDb
- Etc.

Complete list at: <https://documentation.red-gate.com/fd/database-version-support-143754067.html>

Initializing your first Grate



#PASSDataSummit

Important to know

Available for

SQL Server

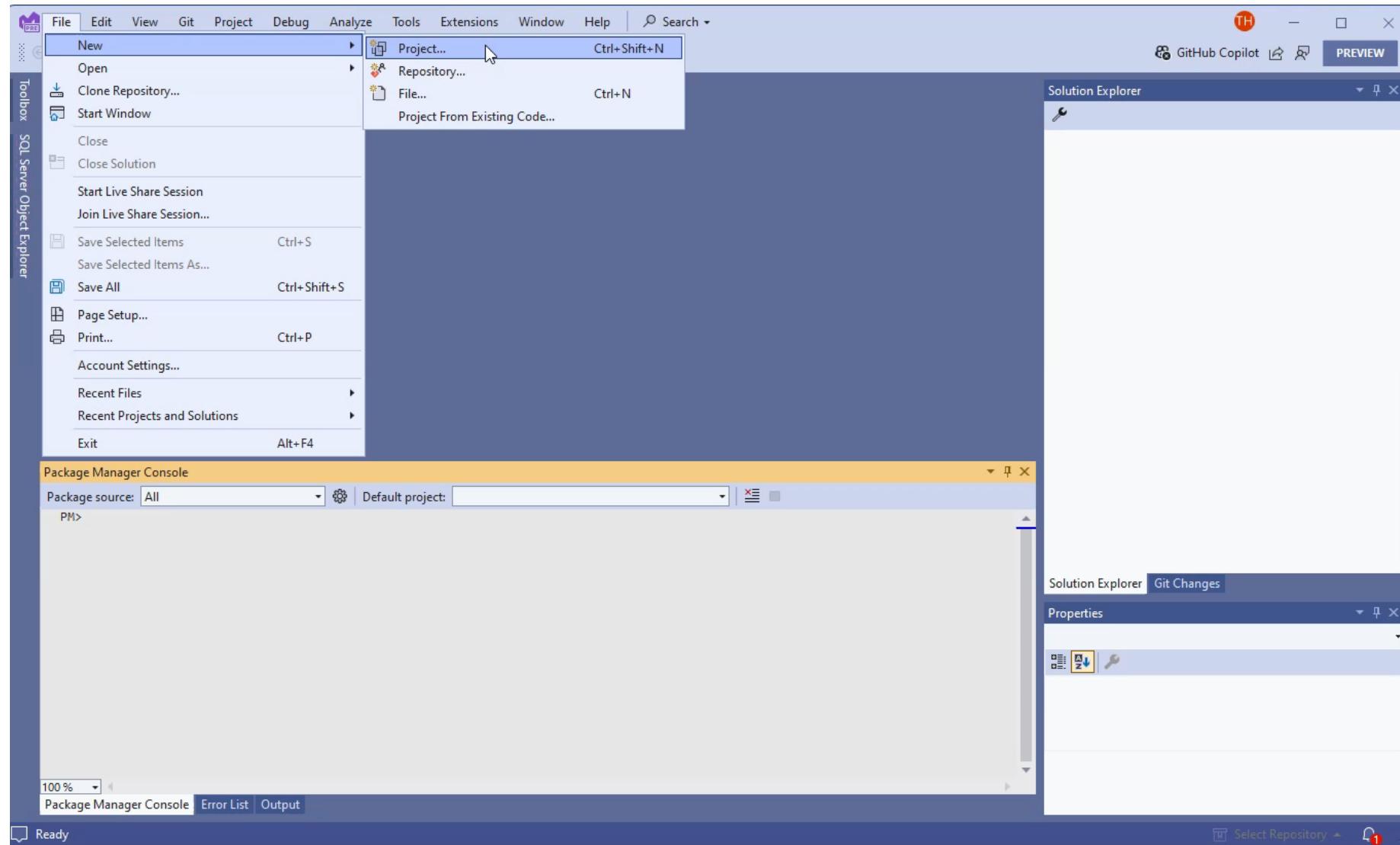
PostgreSQL

Oracle

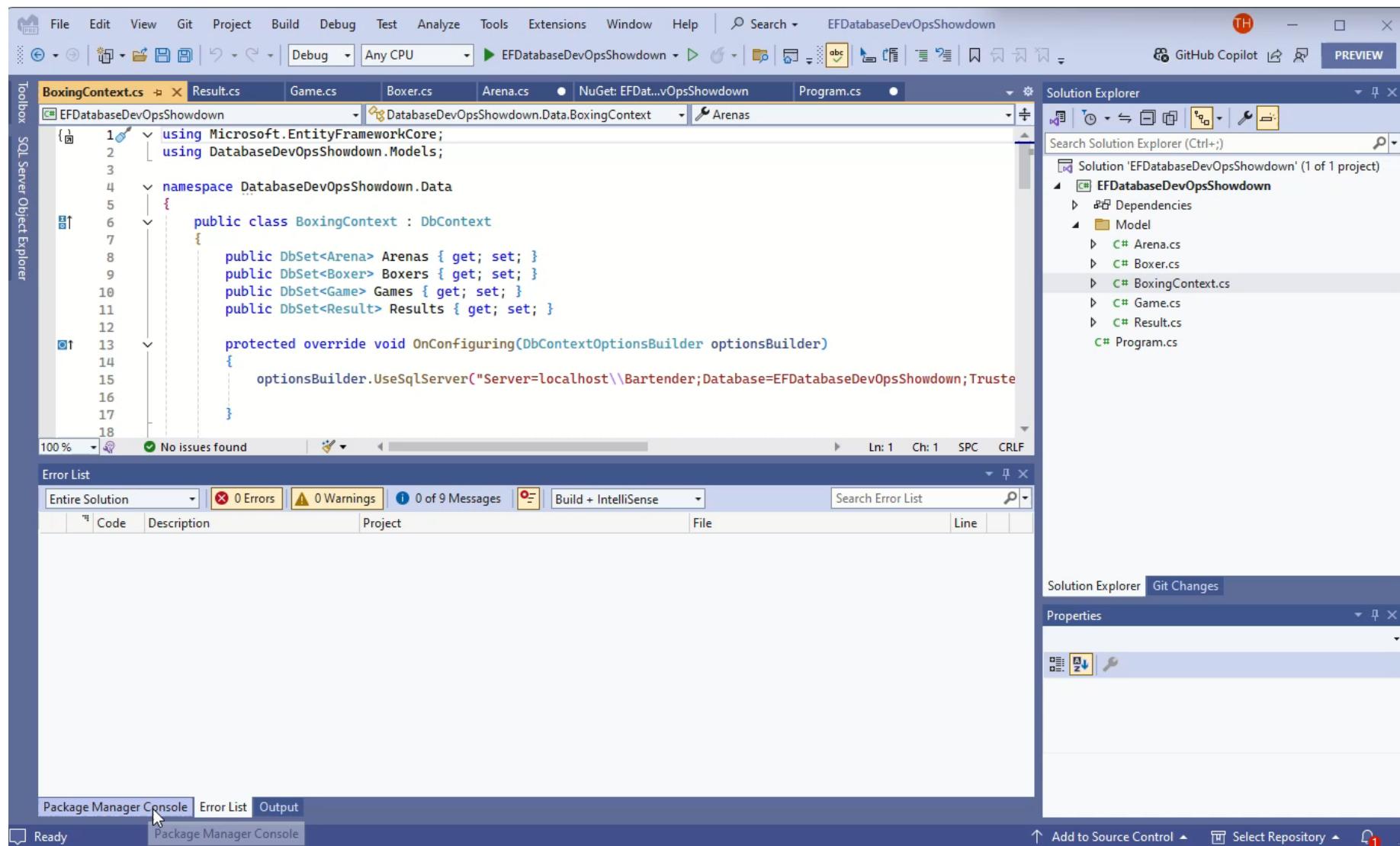
MariaDB/MySQL

Sqlite

Initializing your first EF Core



Initializing your first EF Core



Important to know

Available for (features differ per edition):

SQL Server

PostgreSQL

Oracle

MariaDB/MySQL

Sqlite

Snowflake

DB2

MongoDb

Etc.

Complete list at: <https://learn.microsoft.com/en-us/ef/core/providers/?tabs=dotnet-core-cli>

Comparison between the tools

Tool	Language	Visual UI	Schema Model	Generate migration	Generate rollbacks	Open Source
Flyway (Desktop) Community	SQL	✓				✓ *
Flyway Desktop Enterprise	SQL	✓	✓	✓	✓	
Grate	SQL					✓
EF Core .NET	.NET		✓ *	✓	✓	

Personal Recommendation

Flyway Desktop Enterprise

Most elaborate functionalities

Most User friendly

Best of both worlds; schema model and migrations

Downside, it's paid (trail available)

What happens behind the scenes?

.toml files

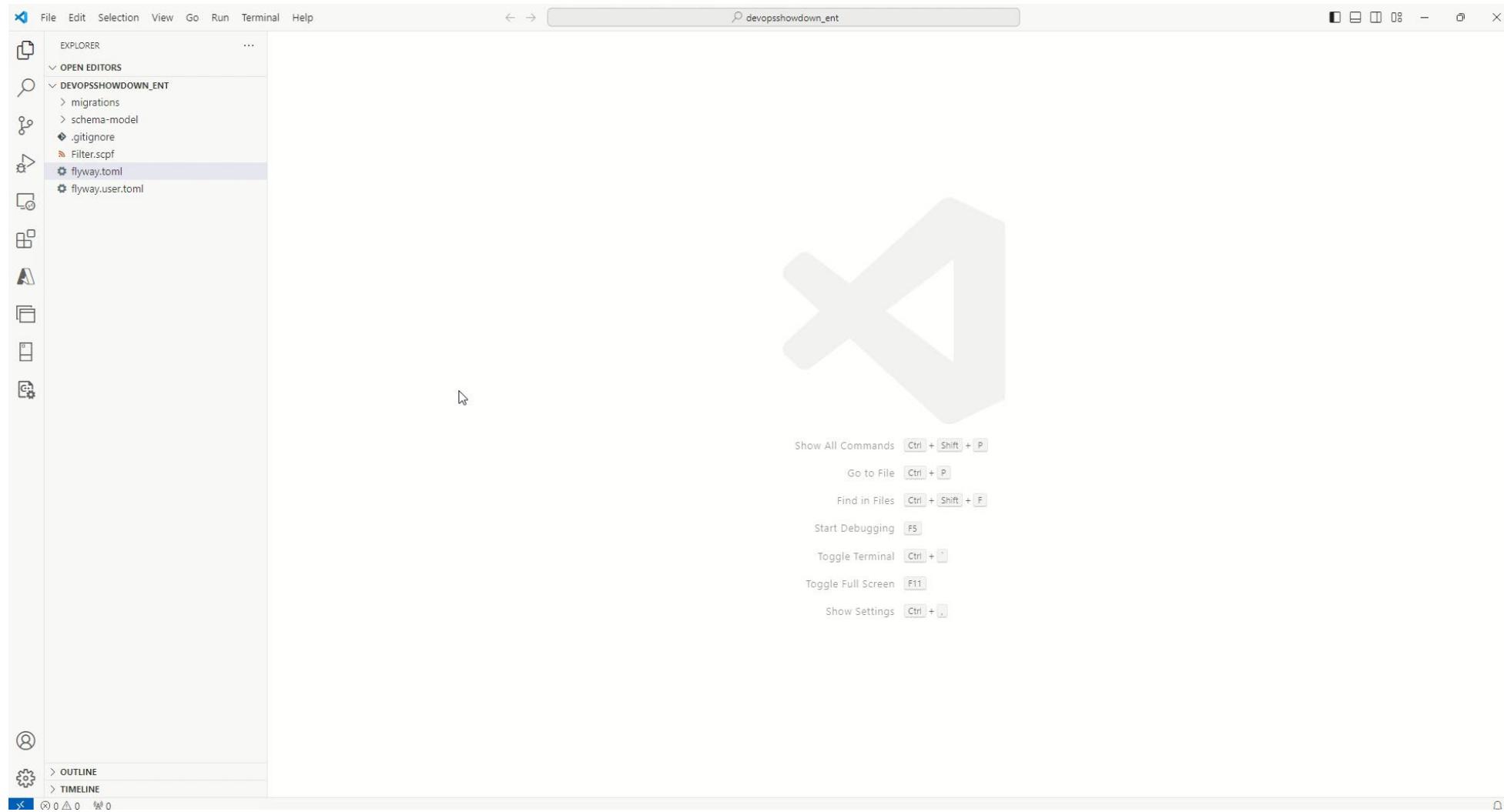
configuration of folders/files

migration / schema-model (not community)

grouping of Database Projects

- ...ie\source\devopsshowdown\Project name
 - migrations
 - schema-model
 - flyway.toml
 - flyway.user.toml

.toml files



Last preparation: Flyway Enterprise – setup VCS

The screenshot shows the Flyway Enterprise application window. The title bar reads "Flyway Enterprise" and the project name is "devopsshowdown_ent". The main interface has a left sidebar with "Schema model", "Generate migrations", and "Migration scripts" options. The central area displays a "Static data & comparisons" section with a search bar, a radio button for "Save to project" (selected), and a "Refresh" button. Below this is a table header with columns "Object name", "Change type", and "Object type". A message at the bottom states "No changes found". On the right side, there's a "VCS" panel. At the bottom, there's a "Give feedback" button and a navigation bar with "Development database" and "Schema model".

End of this Round

Who's the winner?