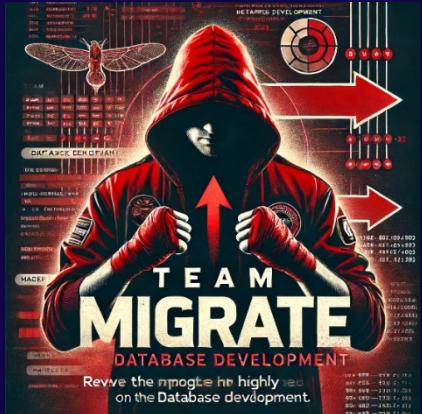
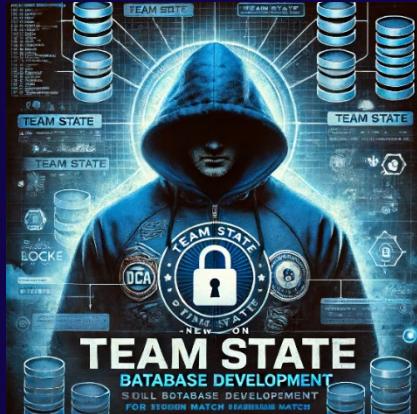


The Database DevOps (CI/CD) Showdown



VS



Tonie Huizer

He/him

Olivier van Steenlandt

He/him



PASS 24

Data Community Summit

ROUND 2

Development Practices

State-based Development

Overview

Making changes

- Adding objects
- Changing objects
- Deleting objects

Deploy to Development

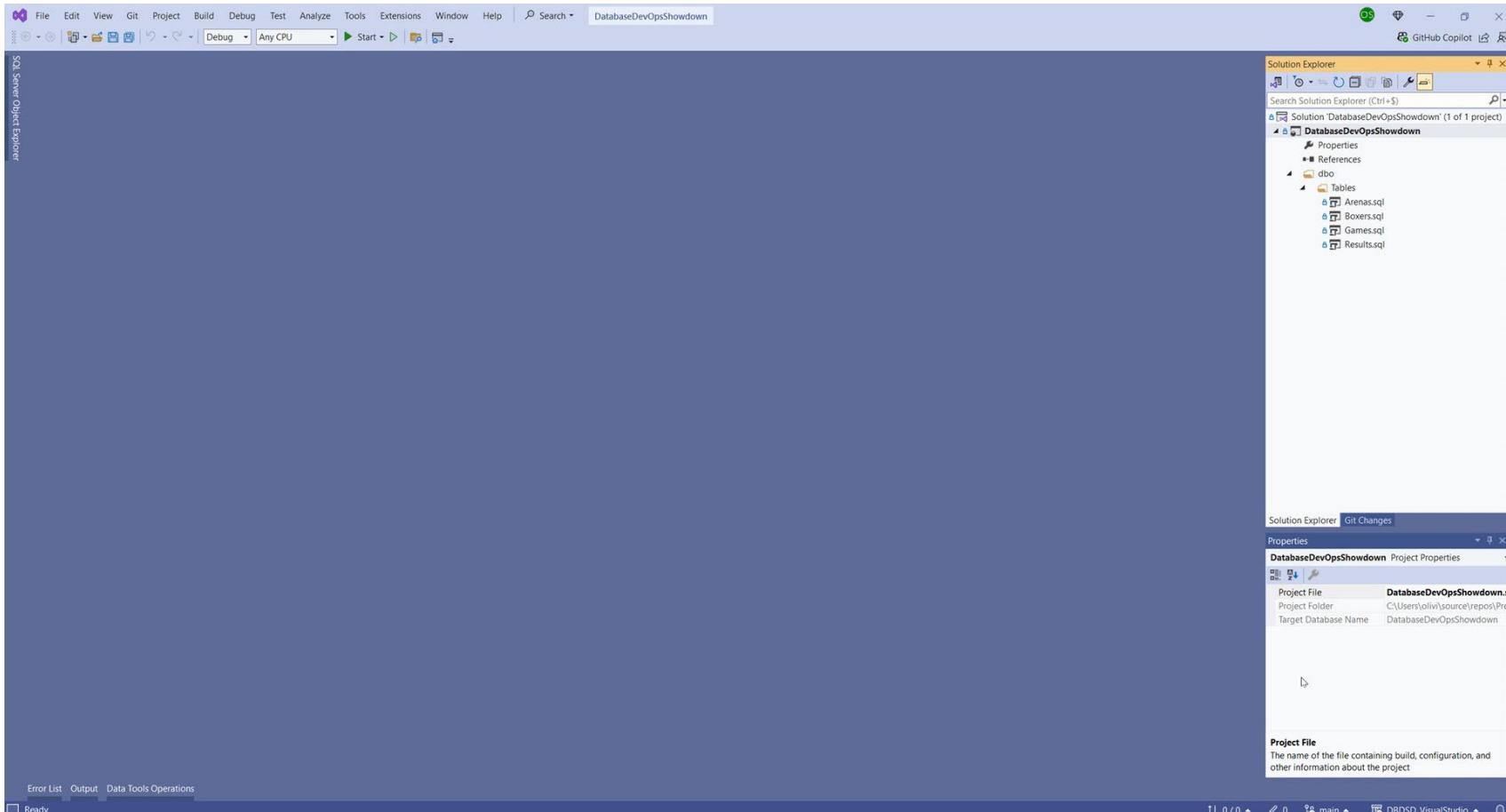
Lab: Stepping into the development ring

Lab: Get your change approved

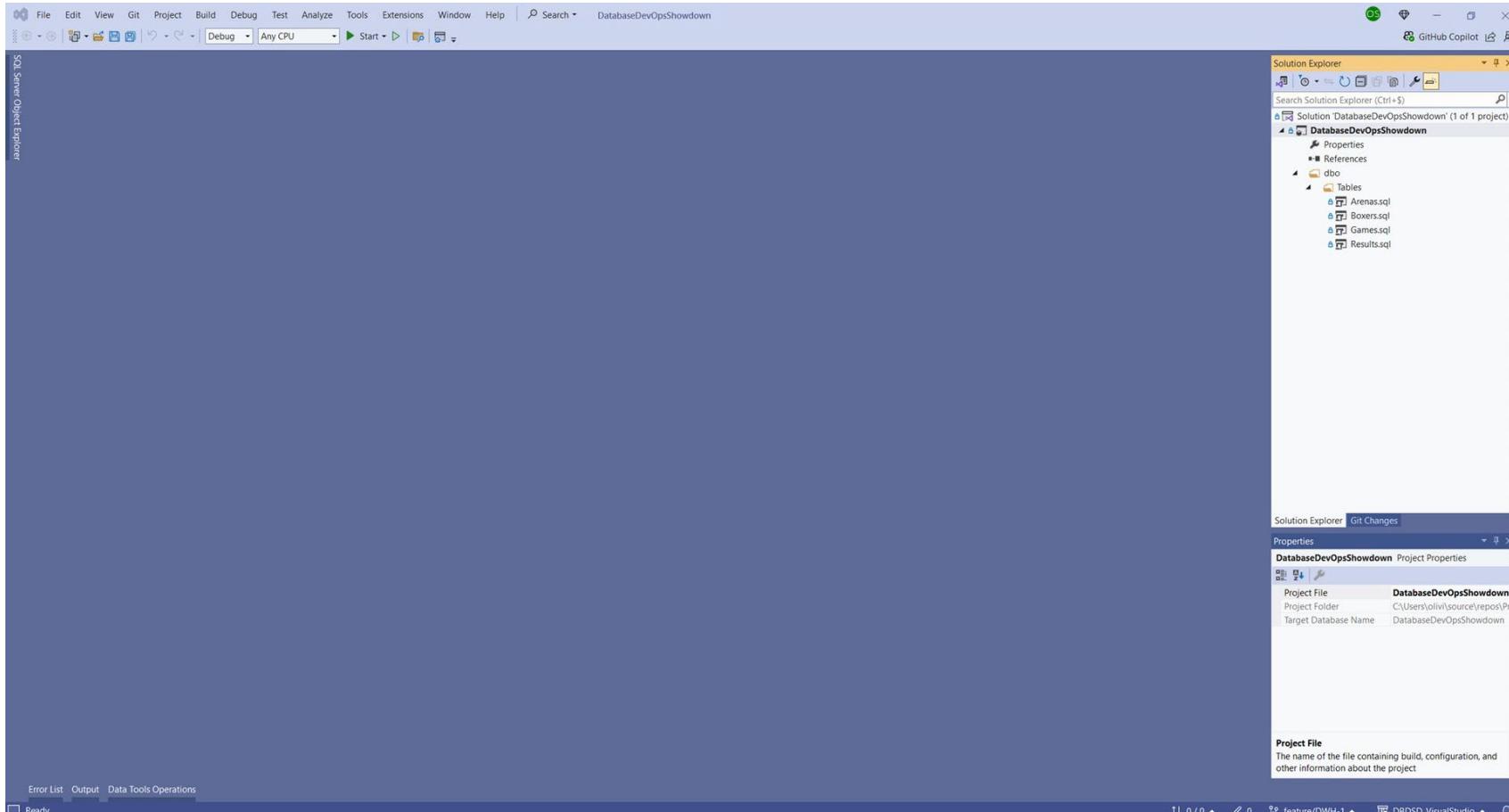
Disclaimer

All development happens locally
&
pushed to a shared environment

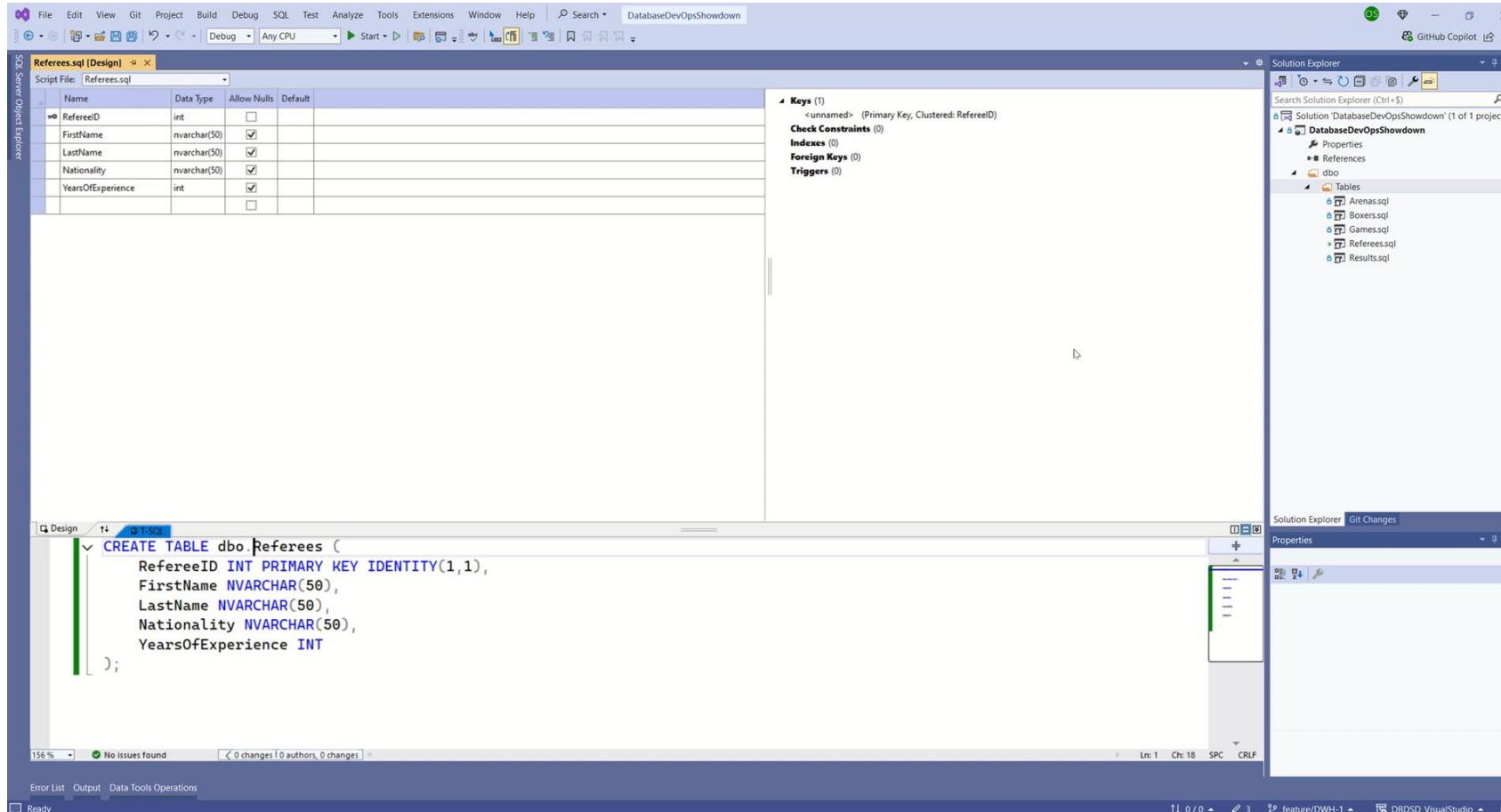
Create a feature branch



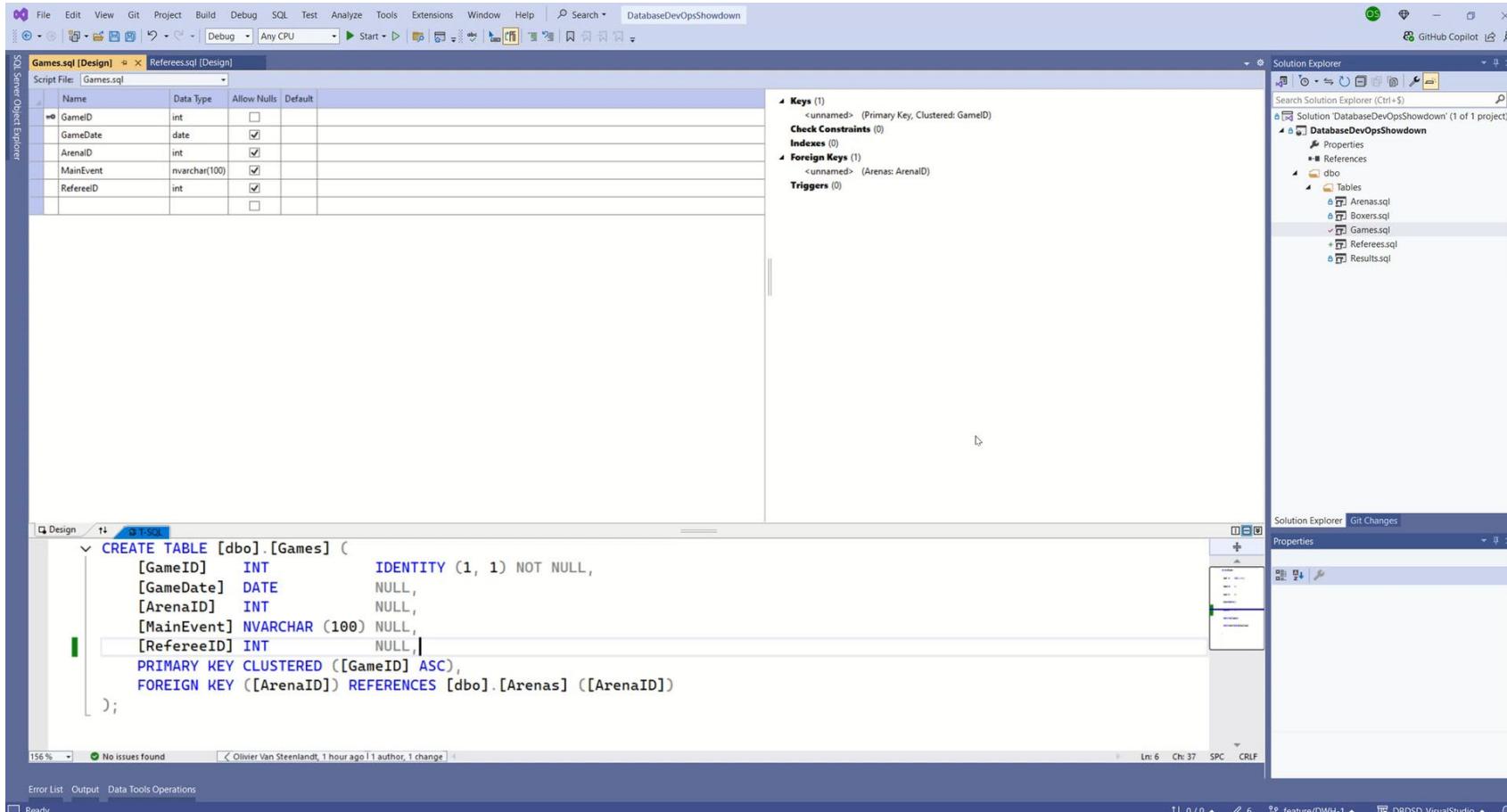
Add an object



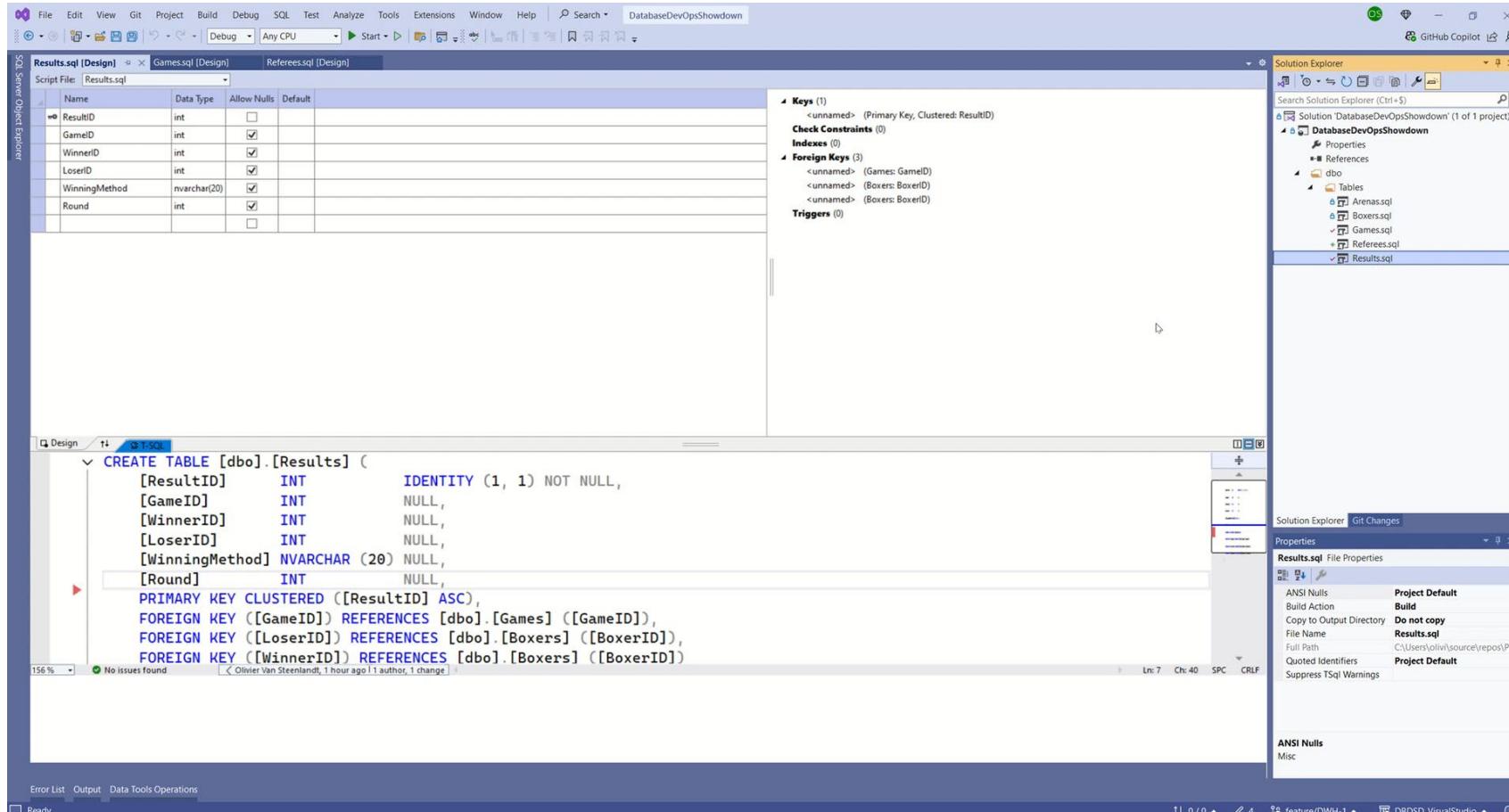
Change an object



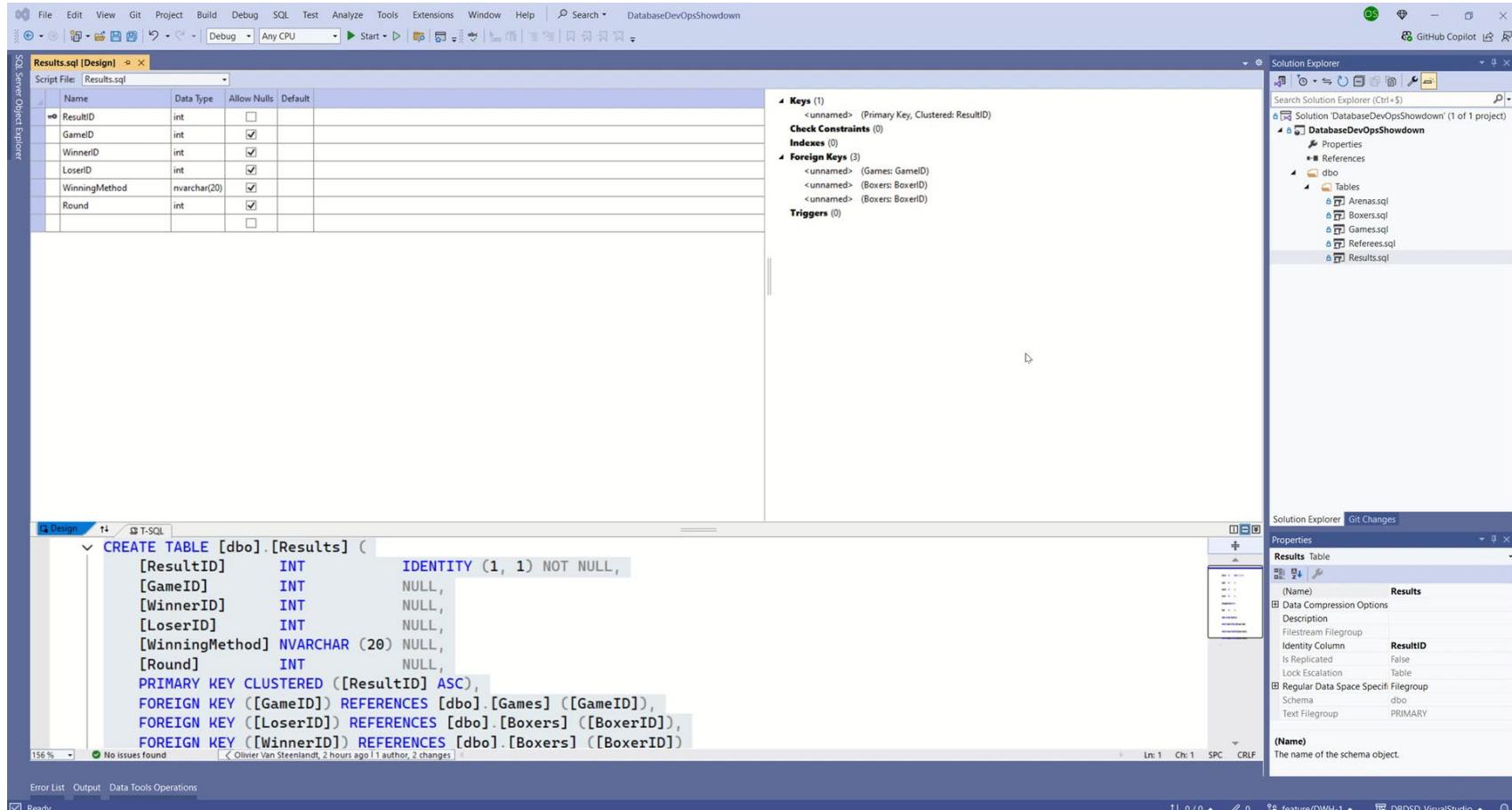
Delete an object



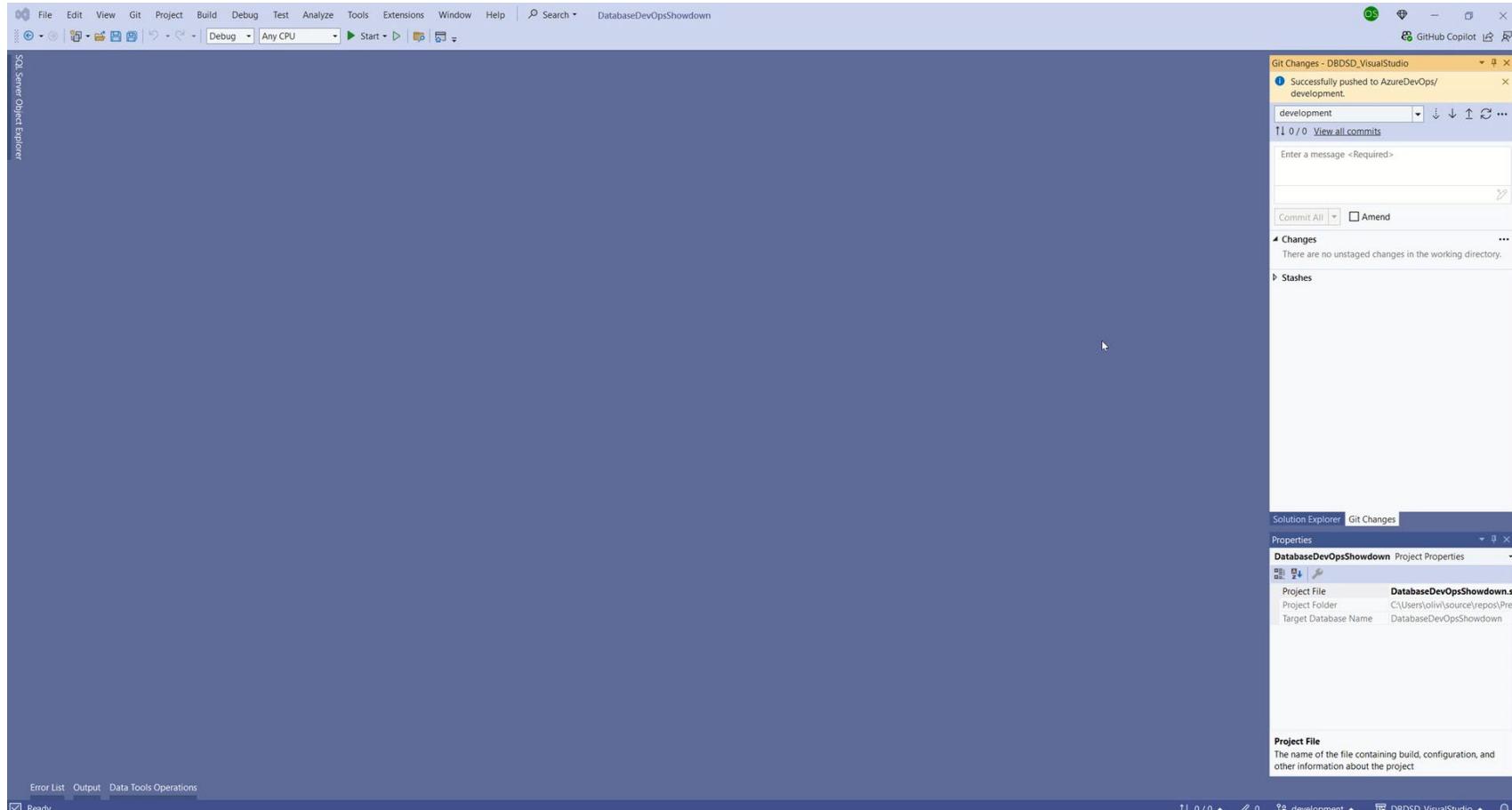
Commit & Push your change



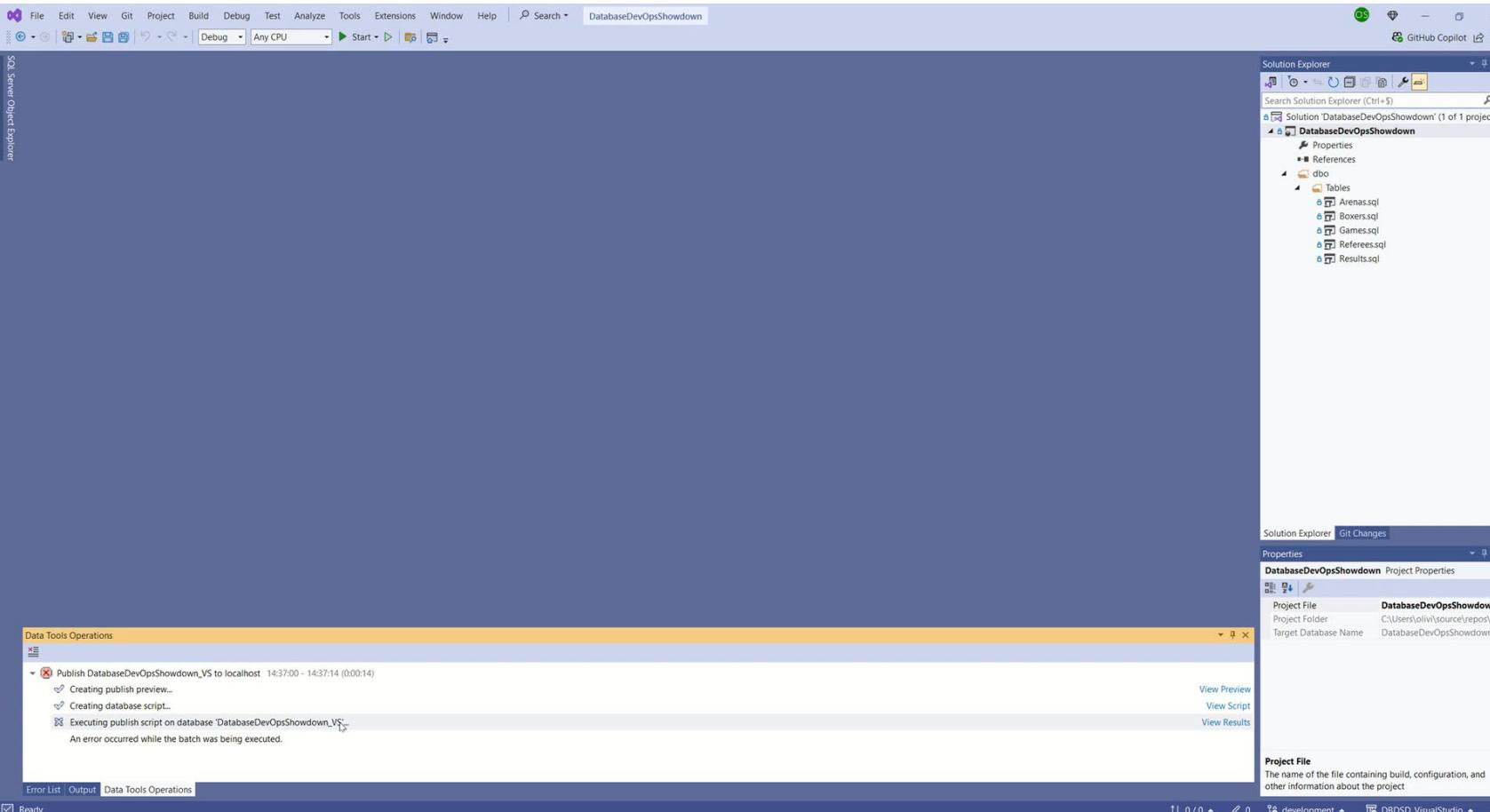
Merge the change to Development



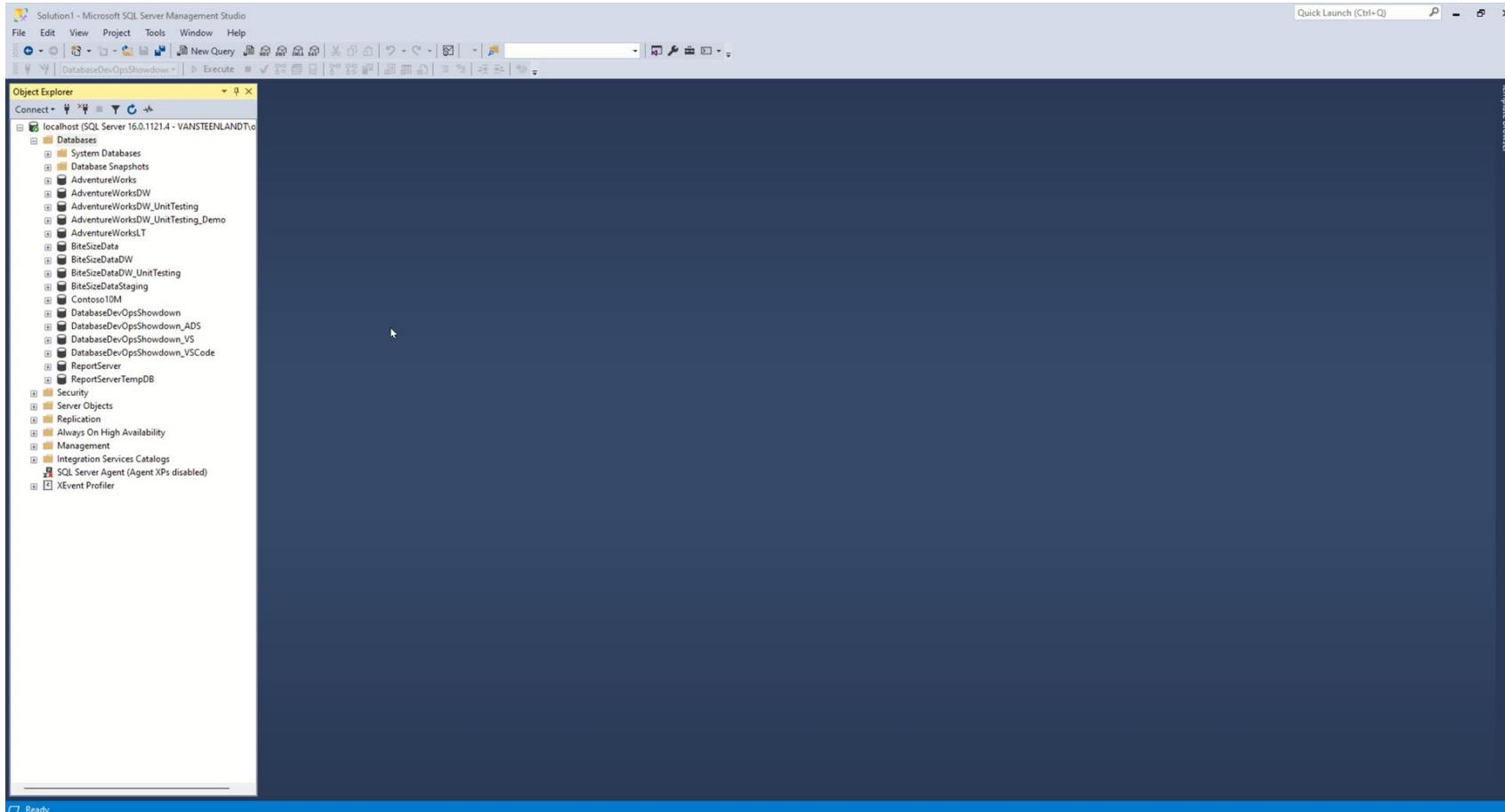
Deploy to development



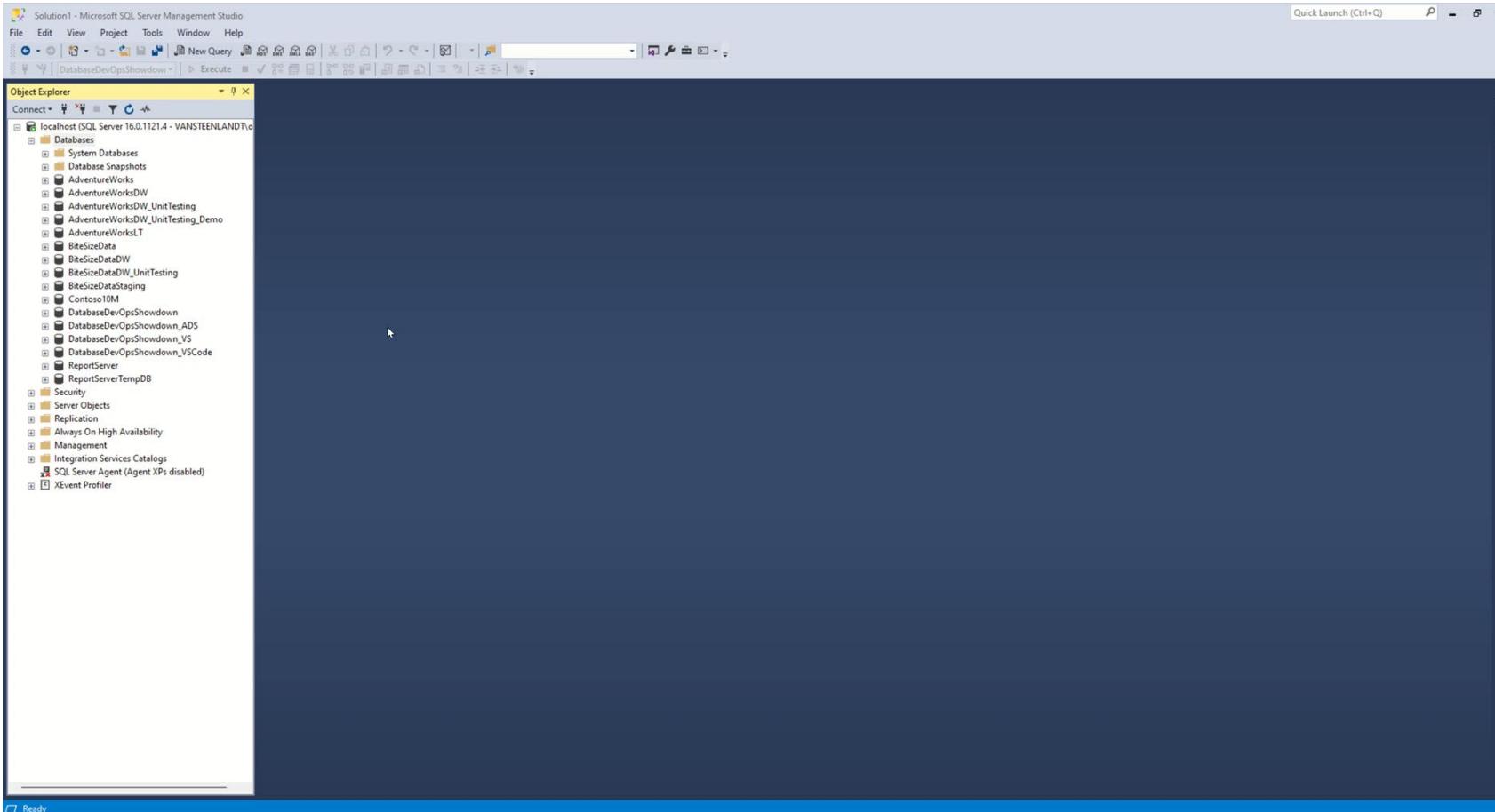
Deploy to development



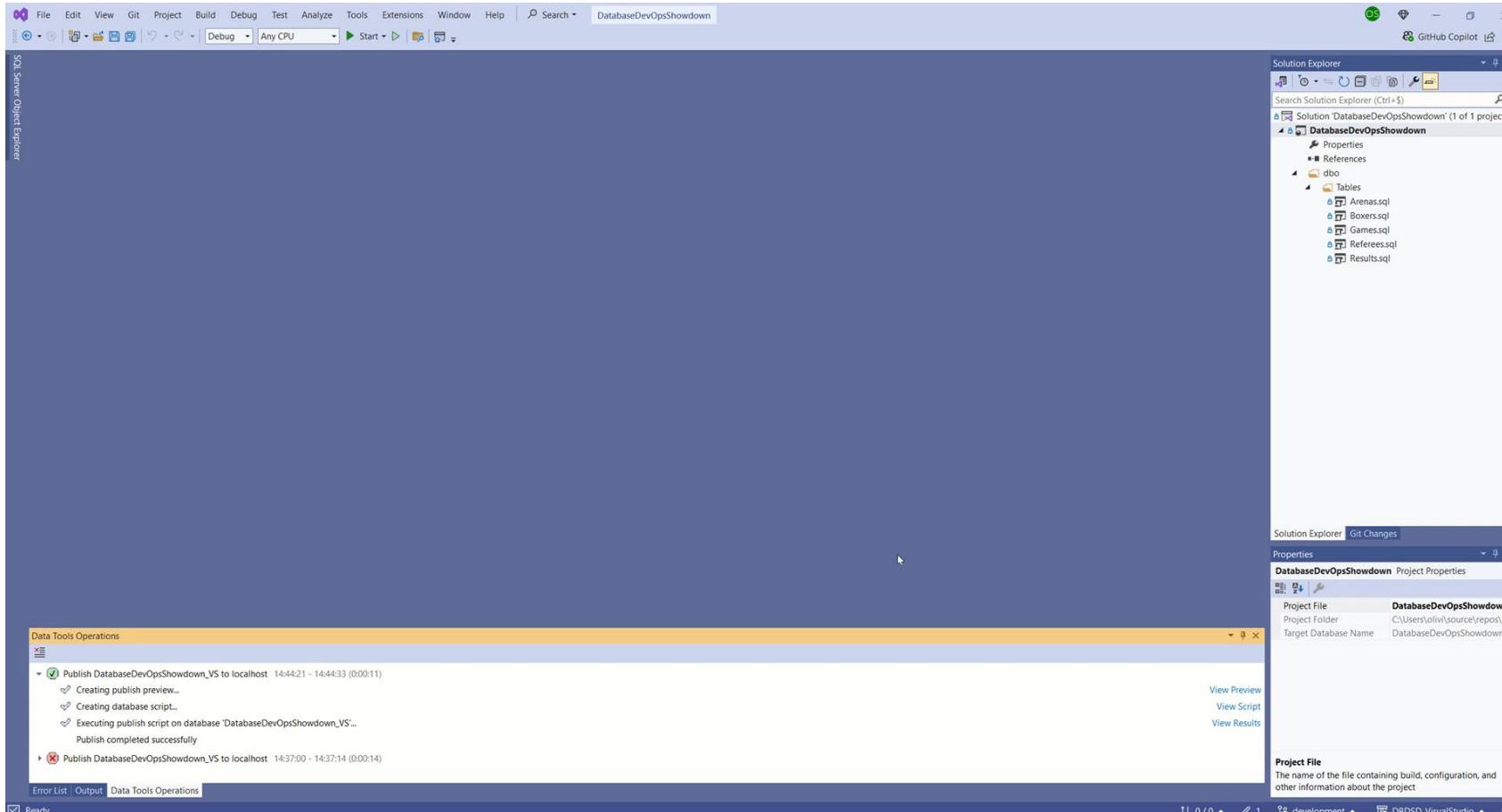
Validation



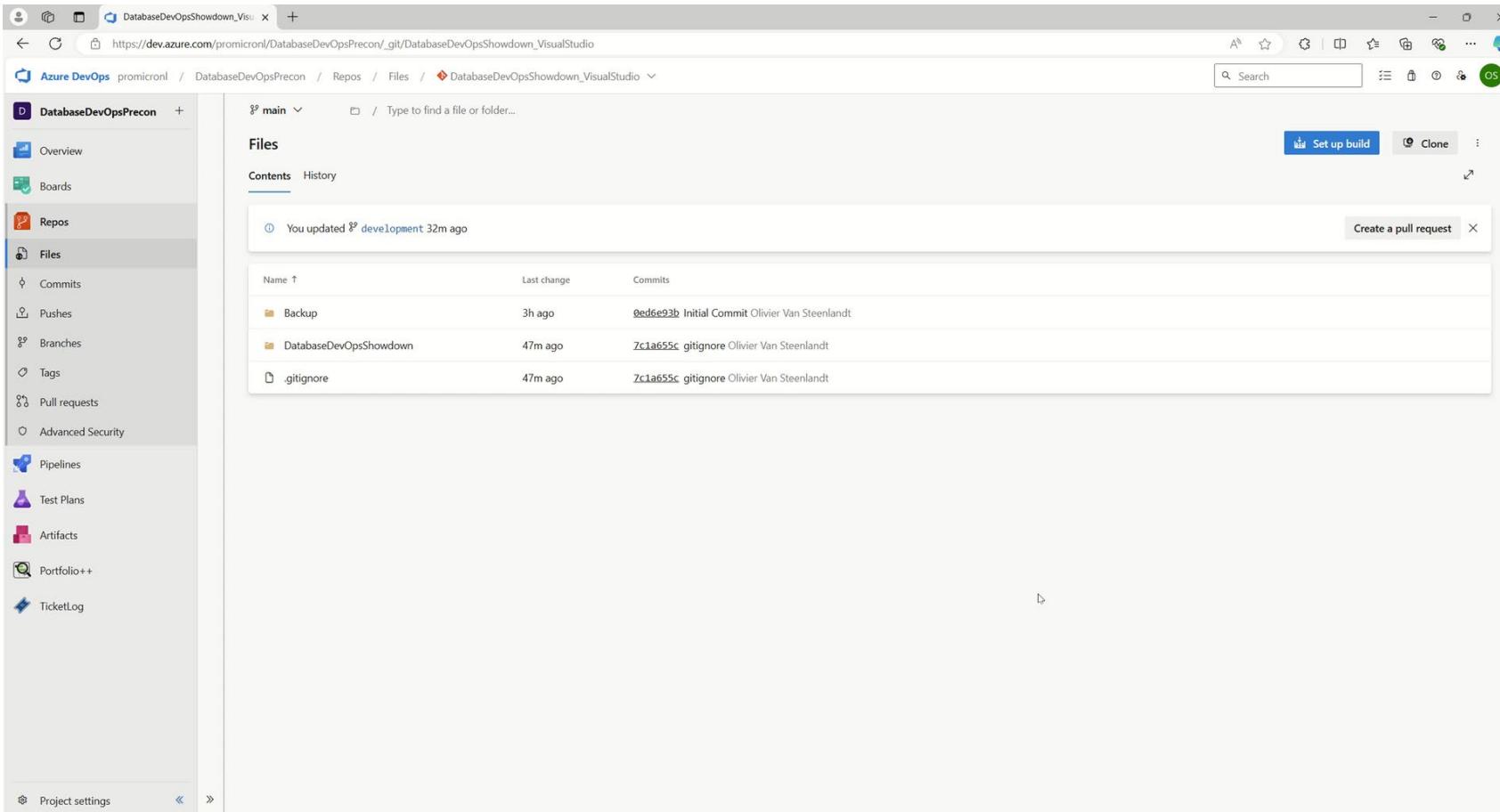
Validation



Validation (2)



Pull Requests



The screenshot shows the Azure DevOps interface for a repository named 'DatabaseDevOpsShowdown_VisualStudio'. The left sidebar is open, showing the 'Repos' section selected. The main area displays a table of files with the following data:

Name	Last change	Commits
Backup	3h ago	0ed6e93b Initial Commit Olivier Van Steenlandt
DatabaseDevOpsShowdown	47m ago	7c1a655c gitignore Olivier Van Steenlandt
.gitignore	47m ago	7c1a655c gitignore Olivier Van Steenlandt

A message at the top left says 'You updated [development](#) 32m ago'. A 'Create a pull request' button is visible in the top right corner of the file list.

Cleanup after Development

- Manual Merge
- Pull Request

Lab

Stepping
into
the Development ring

Migration-based Development

Overview

Making changes

- Adding objects
- Changing objects
- Deleting objects

Lab: Stepping into the development ring

Lab: Adding static data in the game

Create a feature branch

The screenshot shows the Flyway Enterprise application interface. At the top, there's a header with the Flyway logo, 'Flyway Enterprise', and the project name 'devopsshowdown_ent'. Below the header is a toolbar with icons for settings, user profile, help, and redgate. The main area has tabs for 'Schema model' (which is selected), 'Static data & comparisons', and 'Search'. There are buttons for 'Save to project' (selected), 'Apply to database', 'Refresh', and 'Save to project'. A message 'No changes found' is displayed. On the right side, there's a sidebar titled 'VCS' with a list of branches: 'main' (selected), 'feature-branch', 'develop', 'master', and 'hotfix'. Below the sidebar, there's a message: 'Check for development database changes' followed by 'Refresh to check for changes in the development database that need to be imported to the project.' At the bottom, there are buttons for 'Give feedback', 'Development database', and 'Schema model'.

Add an object (schema model)

The screenshot shows the Flyway Enterprise application interface. The top navigation bar includes the Flyway logo, 'Enterprise' status, and the database name 'devopsshowdown_ent'. The main workspace is titled 'Schema model' and displays a table with columns: 'Object name', 'Change type', and 'Object type'. A message at the bottom states 'No changes found'. Above the table, there are buttons for 'Static data & comparisons', 'Search', 'Save to project' (selected), 'Apply to database', 'Refresh', and 'Save to project'. The status bar at the bottom indicates 'Development database' and 'Schema model'.

Schema model

Static data & comparisons

Search

Save to project

Apply to database

Refresh

Save to project

Object name

No changes found

Change type

Object type

topic/AddReferee

Generate migrations

Migration scripts

VCS

0 mins

Check for development database changes

Refresh to check for changes in the development database that need to be imported to the project.

Give feedback

Development database → Schema model

Add an object (migrations)

The screenshot shows the Flyway Enterprise application interface. The top navigation bar includes the Flyway logo, 'Enterprise' status, and the database name 'devopsshowdown_ent'. The main window displays a 'Schema update summary' for a 'Development database' to a 'Schema model'. A green checkmark indicates 'Schema model updated' with a file count of '1 file changed'. The path shown is 'C:\Users\Tonie\source\devopsshowdown_ent\schema-model\Tables\dbo.Referees.sql'. Below this, there's a 'Next steps...' section with a blue 'Generate migration' button. On the left sidebar, there are three items: 'Schema model' (selected), 'Generate migrations', and 'Migration scripts'. On the right sidebar, there are sections for 'VCS' (with a 'topic/AddReferee' message), 'U' (with a '0 mins' status), 'C' (with a '0' status), and 'D' (with a '1' status). At the bottom left is a 'Give feedback' button.

Change an object (schema model)

The screenshot shows the Flyway Enterprise application interface. The top navigation bar includes the Flyway logo, 'Enterprise', and the project name 'devopsshowdown_ent'. The main workspace is titled 'Schema model' and contains a 'Static data & comparisons' section with a search bar and buttons for 'Save to project' and 'Apply to database'. A message indicates 'No changes found'. On the right, there's a sidebar for 'VCS' with a 'never' option selected, and a bottom navigation bar with 'Give feedback', 'Development database', and 'Schema model'.

Flyway Enterprise

devopsshowdown_ent

Schema model

Static data & comparisons

Search

topic/AddReferee

Save to project

Apply to database

Refresh

No changes found

Object name

Change type

Object type

topic/AddReferee

Generate migrations

Migration scripts

Check for development database changes

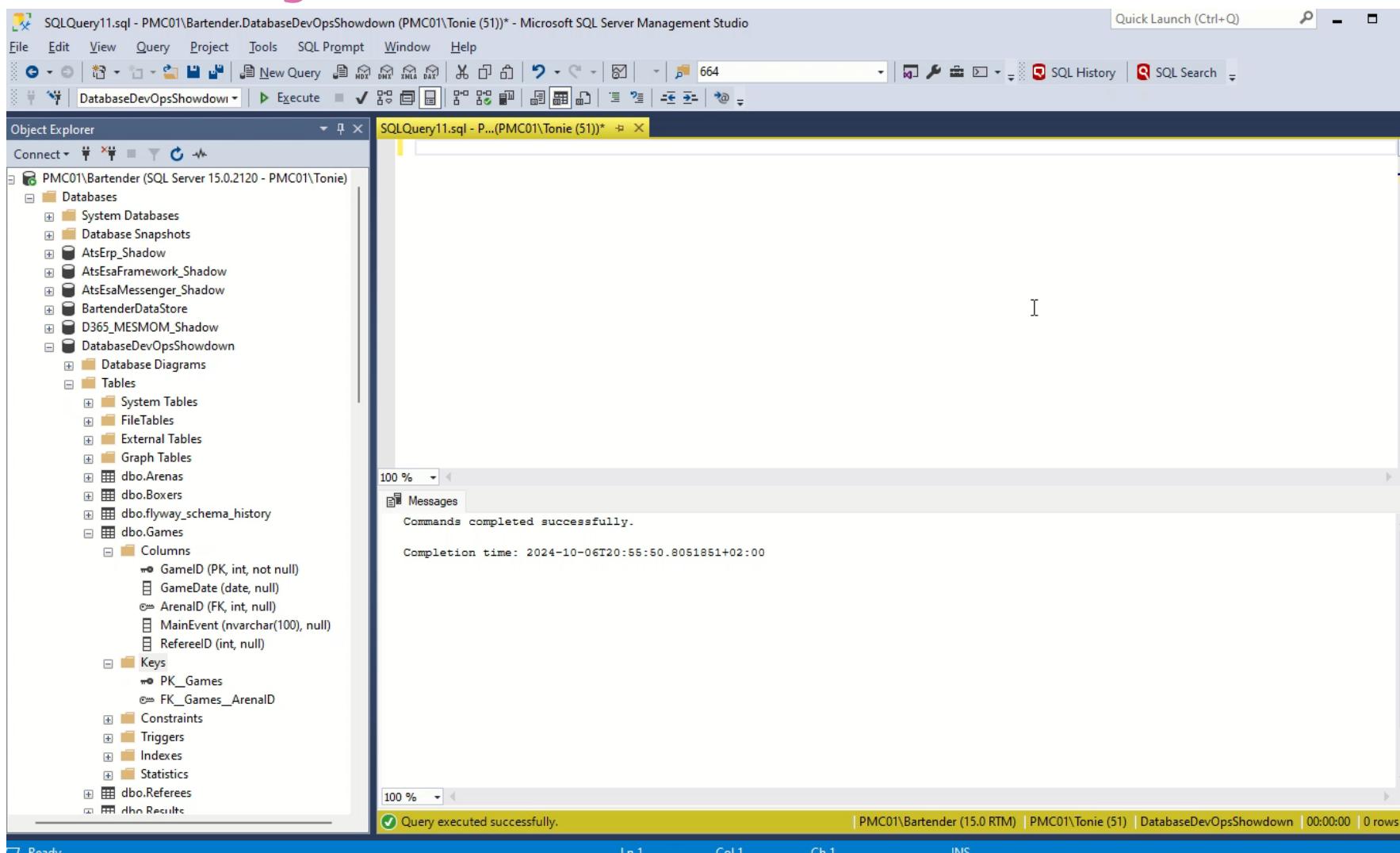
Refresh to check for changes in the development database that need to be imported to the project.

Give feedback

Development database

Schema model

Change an object (rolling back)



Change an object (migrations)

Flyway Enterprise | devopsshowdown_ent

topic/AddReferee

Static data & comparisons

Search

Save to project

Apply to database

Refresh

Apply to database

Updated 4 minutes ago

No changes found

Object name

Change type

Object type

No changes found

Check for project schema changes

Refresh to check for changes in the project schema that need to be applied to the development database.

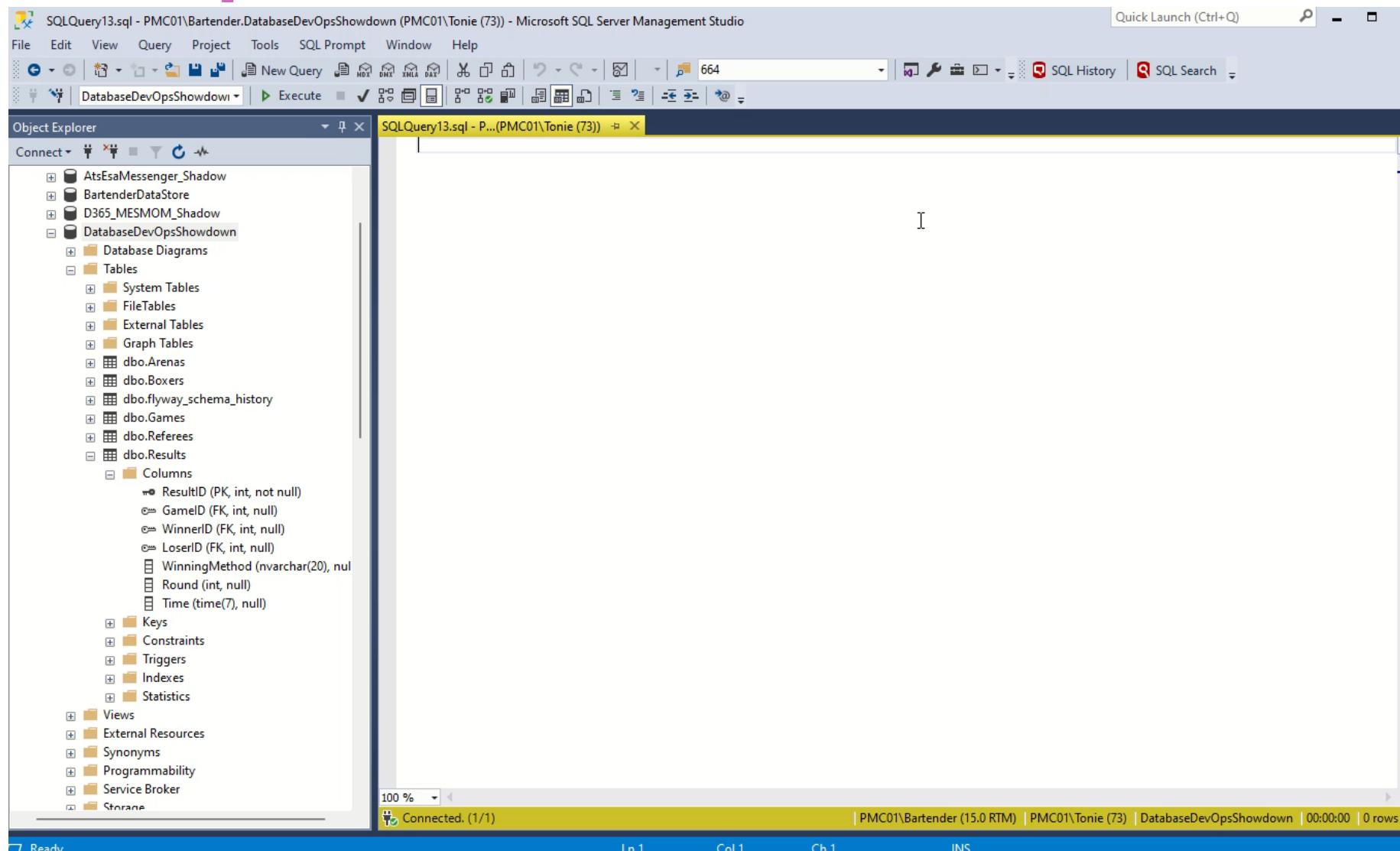
Give feedback

Schema model → Development database

Commit & Push your change

The screenshot shows the Flyway Enterprise application interface. The top navigation bar includes the Flyway logo, 'Enterprise' status, project name 'devopsshowdown_ent', and various system icons. On the left, a sidebar lists 'Schema model', 'Generate migrations', and 'Migration scripts'. The main workspace displays a 'Static data & comparisons' section with a search bar, a radio button for 'Save to project' (selected), and a 'Refresh' button. A message indicates '0 of 0 selected'. Below this is a table header with columns for 'Object name', 'Change type', and 'Object type'. A message at the bottom states 'No changes found'. In the center, there's a small icon of a database with a checkmark and a call-to-action: 'Check for development database changes' followed by instructions to 'Refresh to check for changes in the development database that need to be imported to the project.' At the bottom, there's a 'Give feedback' button and a footer navigation bar with 'Development database' and 'Schema model'.

Delete (drop a column)



Commit & Push your change

Flyway Enterprise | devopsshowdown_ent

topic/AddReferee

Schema model

Generate migrations

Migration scripts

Static data & comparisons

Search

Save to project (radio button selected)

Apply to database

Refresh

No changes found

Object name

Change type

Object type

Updated a few seconds ago

VCS

never

0

3

0

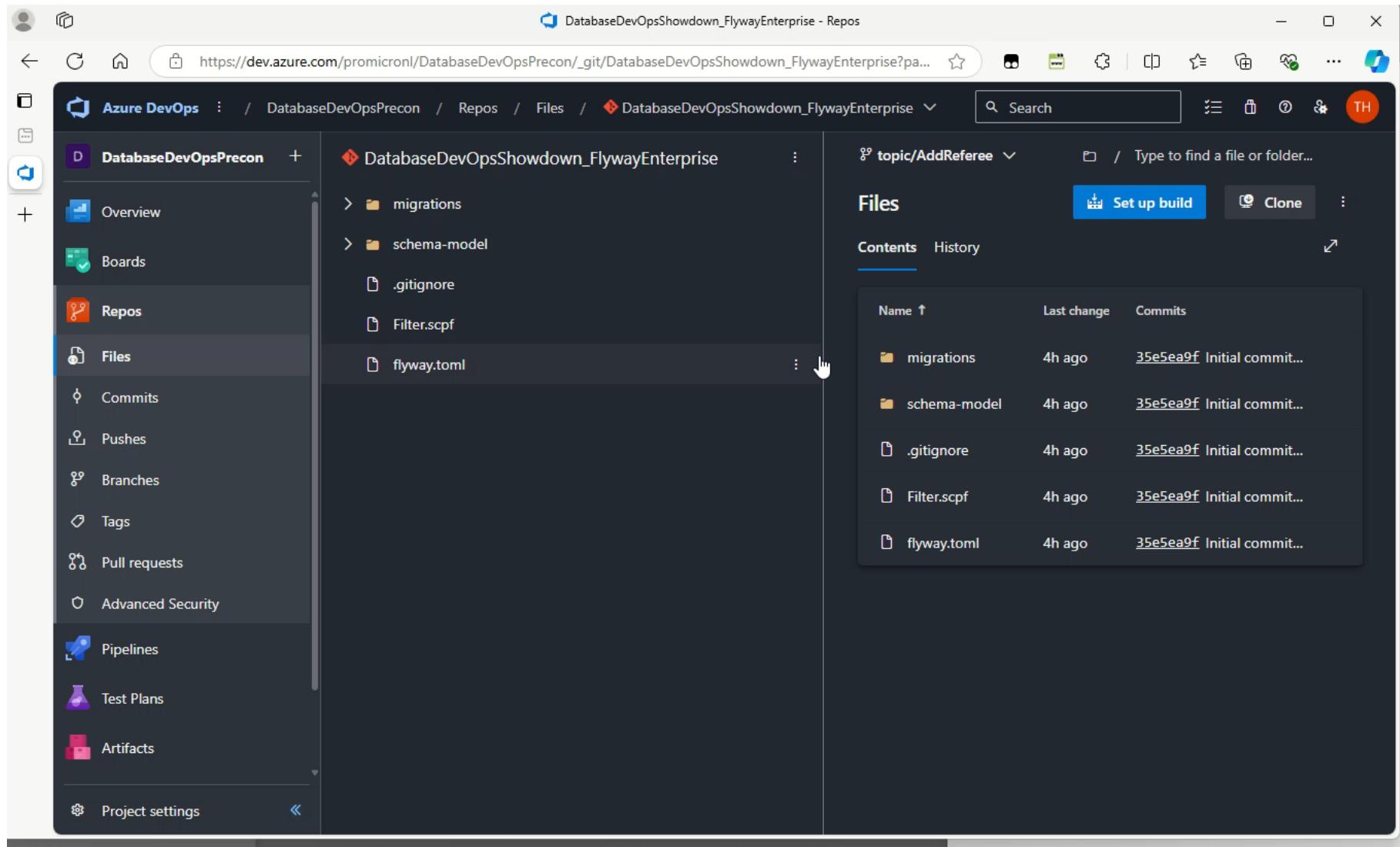
Check for development database changes

Refresh to check for changes in the development database that need to be imported to the project.

Give feedback

Development database → Schema model

Create a Pull Request (1)



The screenshot shows the Azure DevOps interface for the 'DatabaseDevOpsShowdown_FlywayEnterprise' repository. The left sidebar navigation includes 'Overview', 'Boards', 'Repos' (selected), 'Files' (selected), 'Commits', 'Pushes', 'Branches', 'Tags', 'Pull requests', 'Advanced Security', 'Pipelines', 'Test Plans', 'Artifacts', and 'Project settings'. The top header bar shows the repository name and a search bar. The main content area displays the repository structure with files: 'migrations', 'schema-model', '.gitignore', 'Filter.scpf', and 'flyway.toml'. A table lists these files with columns for Name, Last change, and Commits, all showing a recent commit 4 hours ago.

Name	Last change	Commits
migrations	4h ago	35e5ea9f Initial commit...
schema-model	4h ago	35e5ea9f Initial commit...
.gitignore	4h ago	35e5ea9f Initial commit...
Filter.scpf	4h ago	35e5ea9f Initial commit...
flyway.toml	4h ago	35e5ea9f Initial commit...

Create a Pull Request (2)

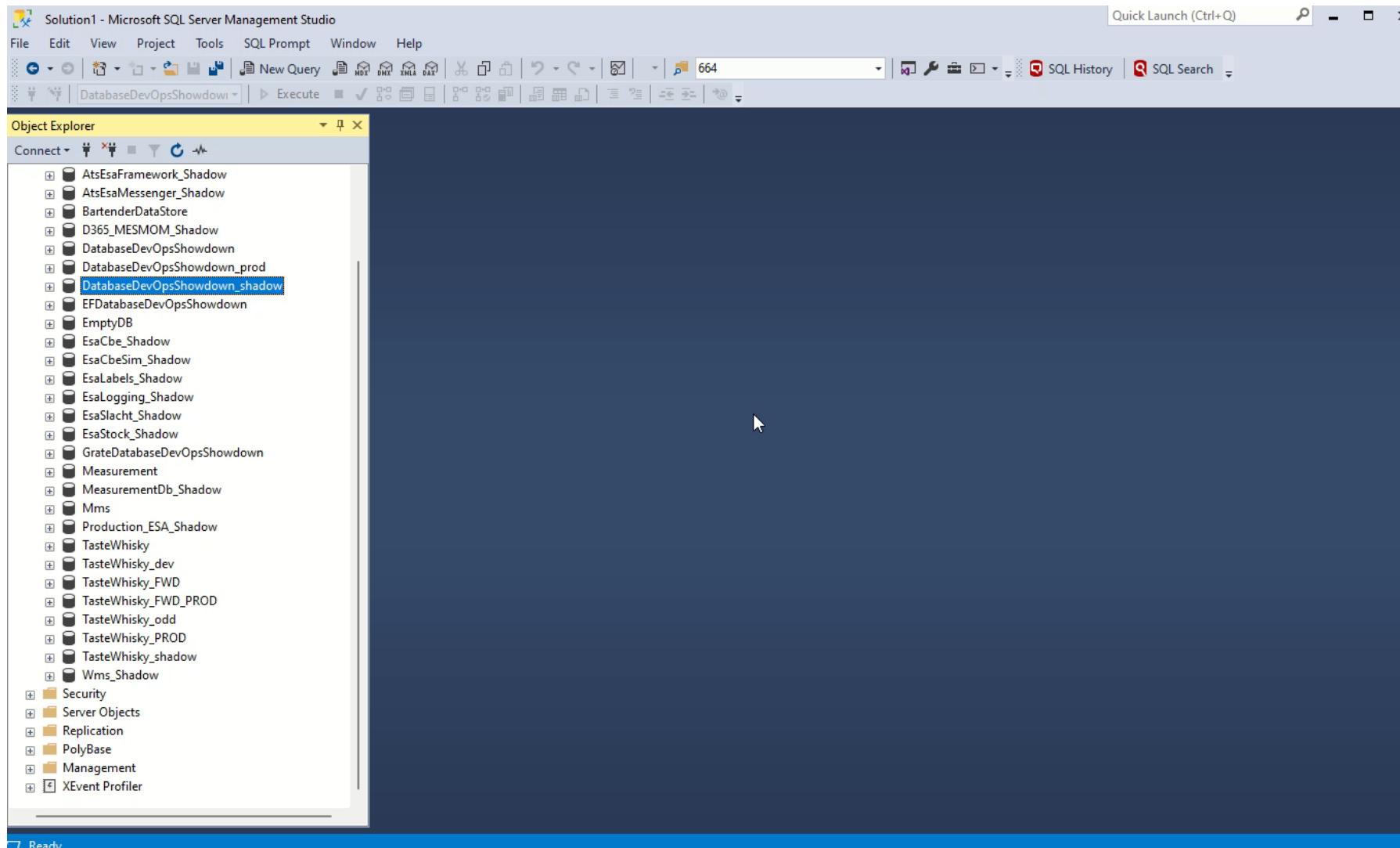
The screenshot shows the Azure DevOps interface for creating a pull request. The left sidebar lists project navigation options like Overview, Boards, Repos, Files, Commits, Pushes, Branches, Tags, Pull requests (which is selected), Advanced Security, Pipelines, Test Plans, and Artifacts. The main area displays the pull request details for 'DatabaseDevOpsShowdown_FlywayEnterprise'. The 'Description' section contains the following text:

Referee is now part of the boxing data.

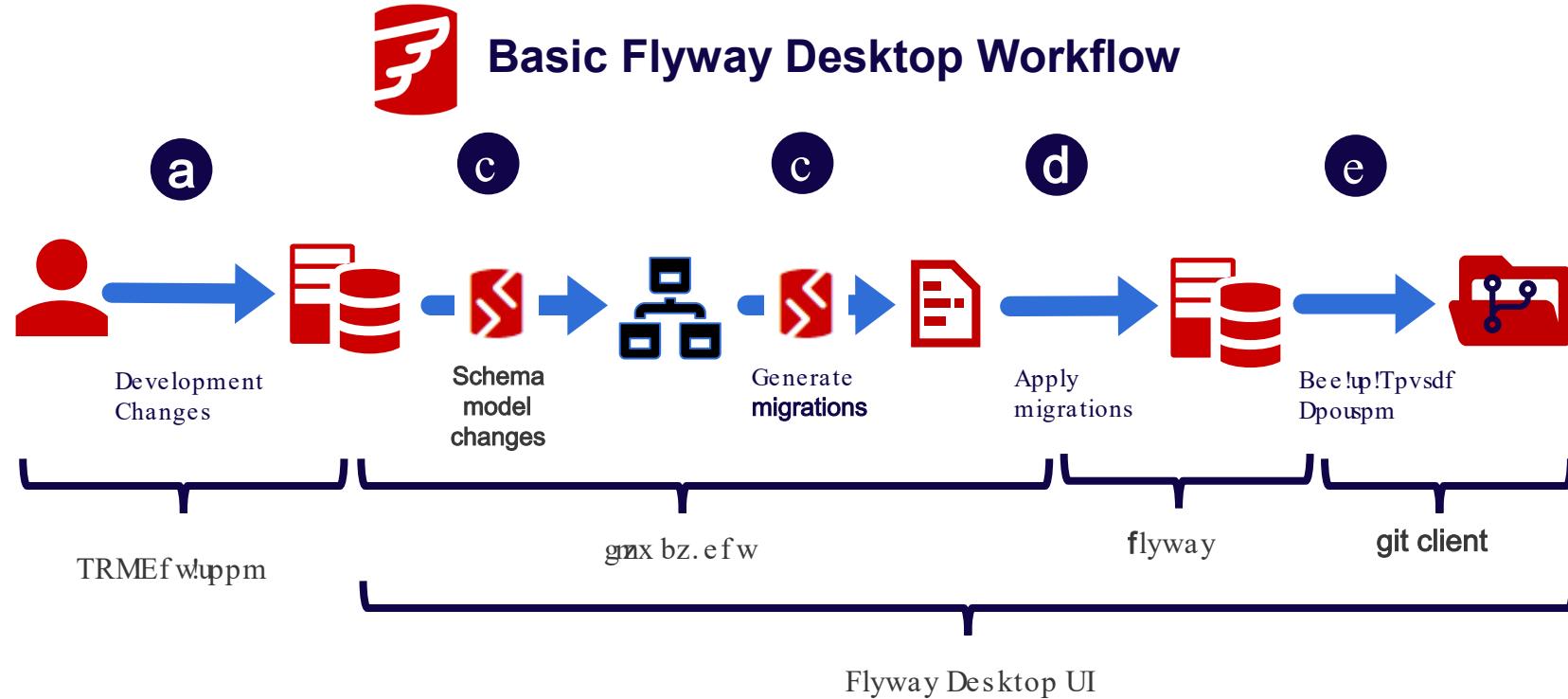
- Added new table and extra column for the referee
- Remove time from result, this was not accurate and should no longer be kept

Below the description, there's a note that Markdown is supported and a rich text editor toolbar. The 'Reviewers' section has a search bar for users and groups. The 'Work items to link' section has a search bar. The 'Tags' section has a text input field and a 'Create' button. The top of the page shows the URL https://dev.azure.com/promicronl/DatabaseDevOpsPrecon/_git/DatabaseDevOpsShowdown_FlywayEnterprise/pullrequest/1.

What happened behind the scenes? (Shadow db)



What just happened?

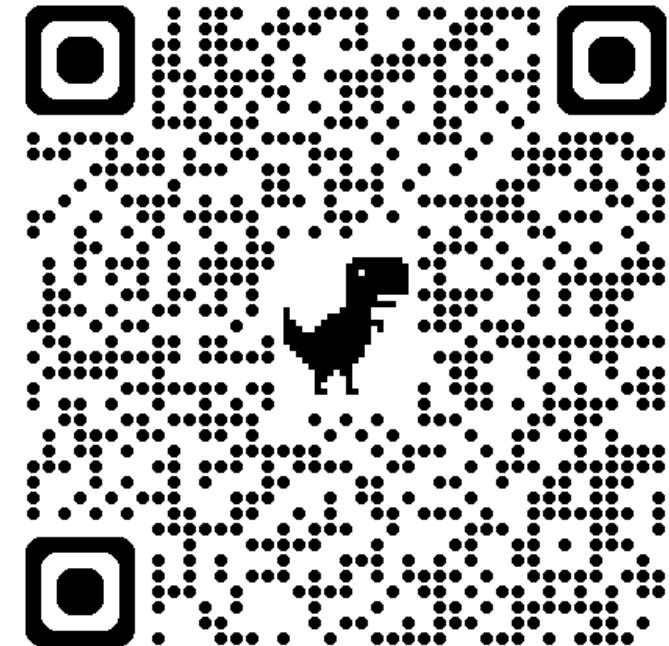


Lab

Stepping
into
the Development ring

What about static data?

- SQL Compare for data -> Data compare
- Only in Enterprise version
- There are strings attached, see ->



Configure static data

The screenshot shows the Flyway Enterprise application interface. The title bar indicates the project is 'devopsshowdown_ent'. The left sidebar has options for 'Schema model', 'Generate migrations', and 'Migration scripts'. The main area is titled 'Static data & comparisons' and shows a search bar, a 'Save to project' radio button (selected), and a 'Refresh' button. Below the search bar, it says '0 of 0 selected'. A table header includes columns for 'Object name', 'Change type', and 'Object type'. A message at the bottom states 'No changes found'. In the center, there's a 'Check for development database changes' section with a refresh icon and instructions to 'Refresh to check for changes in the development database that need to be imported to the project.' The bottom navigation bar includes 'Give feedback', 'Development database' (with an arrow to 'Schema model'), and a 'Save to project' button.

Add initial static data

The screenshot shows the Flyway Enterprise interface with the database connection `devopsshowdown_ent` selected. A modal window titled "Configure comparisons" is open, specifically the "Static Data" tab. The instructions within the modal state: "You can mark static data tables, such as postal codes, country lists and currencies to your schema model from this screen. Any data changes will be checked and included in generated migration scripts. Select a table to manage which columns are being tracked." Below this, there is a search bar with the placeholder "Please select or type to filter..." and a button labeled "+ Track selected tables". A table lists the tracked columns for the `Arenas` table, showing `dbo` as the schema, `Arenas` as the table, `4 (4 tracked)` as the number of columns, and `10` as the number of rows. To the right of the table is a list of columns: `Column name` (unchecked), `ArenaID` (checked), and `ArenaName` (checked). At the bottom of the modal are "Cancel" and "Save" buttons, with a cursor hovering over the "Save" button.

Changing static data

The screenshot shows the Microsoft SQL Server Management Studio interface. The title bar reads "SQLQuery20.sql - PMC01\Bartender.DatabaseDevOpsShowdown (PMC01\Tonie (68))* - Microsoft SQL Server Management Studio". The Object Explorer sidebar shows the database structure, including tables like dbo.Arenas, dbo.Boxers, and dbo.Games. The main results grid displays 10 rows of arena data:

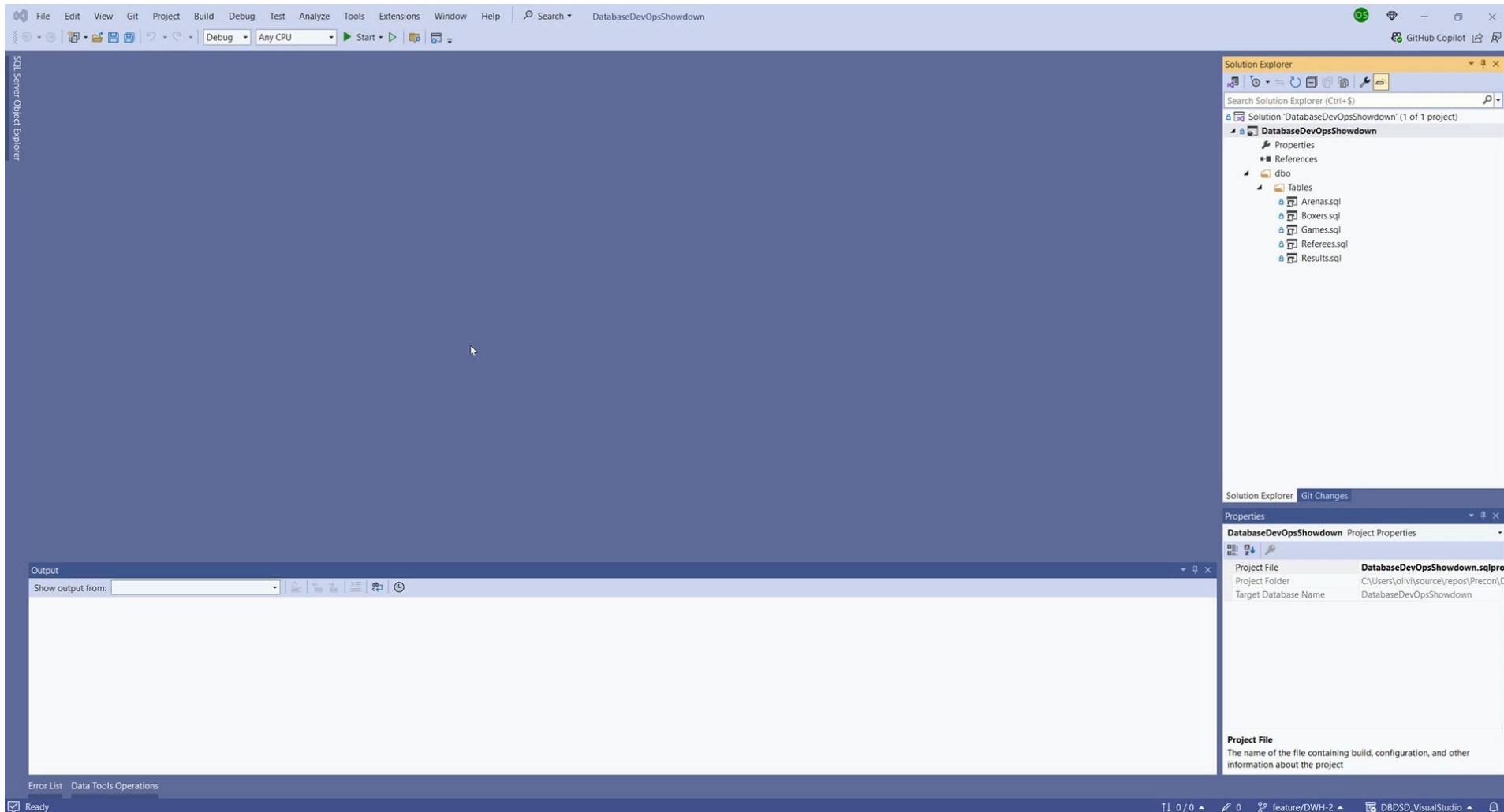
ArenaID	ArenaName	Location	Capacity
1	Stade du 20 Mai	Kinshasa, Zaire	80000
2	MGM Grand Garden Arena	Las Vegas, USA	17000
3	MGM Grand	Las Vegas, USA	17000
4	Caesars Palace	Las Vegas, USA	24000
5	The Pyramid	Memphis, USA	21000
6	T-Mobile Arena	Las Vegas, USA	20000
7	T-Mobile Arena	Las Vegas, USA	20000
8	MGM Grand	Las Vegas, USA	17000
9	Mandalay Bay Events Center	Las Vegas, USA	12000
10	Staples Center	Los Angeles, USA	20000

The status bar at the bottom indicates "Query executed successfully." and "PMC01\Bartender (15.0 RTM) | PMC01\Tonie (68) | DatabaseDevOpsShowdown | 00:00:00 | 10 rows".

What about static data for State Based?

- “No Easy Solution”
- Post Deployment Script
 - Custom logic to insert data when missing

Post Deployment Scripts



Post Deployment Scripts

The screenshot shows the Microsoft SQL Server Management Studio (SSMS) interface. The main window displays a T-SQL script named "Script.PostDeployment.sql" which inserts a new row into the "Arenas" table. The script uses a common table expression (CTE) to define a temporary table "d" with three columns: ArenaName, [Location], and Capacity. It then selects data for this CTE from a static list. Finally, it performs a left join between the CTE and the "Arenas" table to find rows where the arena name exists in the CTE but not in the main table, indicating a new arena to be inserted. The SSMS interface includes a Solution Explorer, Properties, and Git Changes panes.

```
*  
INSERT INTO dbo.Arenas(ArenaName, [Location], Capacity)  
SELECT d.ArenaName, d.[Location], d.Capacity  
FROM (  
    SELECT      'Madison Square Garden' AS ArenaName,  
                'New York, USA' AS [Location],  
                20789 AS Capacity  
) AS d  
LEFT JOIN dbo.Arenas AS a  
    ON d.ArenaName = a.ArenaName  
WHERE a.ArenaID IS NULL;
```

End of this Round

Who's the winner?