Emergent Software

Three relational databases walk into a NoSQL bar. They left after 5 mins....
They couldn't find a table! 😄

sp_Develop

Emergent Software – SQL Server Assessment

Successful Software & Database Projects Start Here

https://github.com/EmergentSoftware/SQL-Server-Development-Assessment - or -
https://emergentsoftware.github.io/SQL-Server-Development-Assessment

Slide Deck: https://kevinmartin.tech/sp_develop-session

What is sp_Develop?

The open-source SQL Server Assessment project contains the sp_Develop stored procedure. It can be used by database developers, software developers and for performing database code (smell) assessments to adhere to best practices.

sp_Develop runs on SQL Server 2005, 2008, 2008 R2, 2012, 2014,2016, 2017, 2019, Azure SQL Server

```
EXEC dbo.sp_Develop
```

100 %

Results | Messages

	ObjectName	ObjectType	FindingGroup	Finding	Details
1	fn_PrefixNameSkipMe	SQL_SCALAR_FUNCTION	Naming Conventions	Including Special Characters in Name	Special characters should not b
2	fn_PrefixNameSkipMe	SQL_SCALAR_FUNCTION	Naming Conventions	Using Prefix in Name	Never use a prefix such as tbl, s
3	fn_PrefixNameSkipMe	SQL_SCALAR_FUNCTION	SQL Code Development	Using User-Defined Scalar Function	You should inline your scalar fu
4	fnPrefixNameTableValuedFunctionSkipMe	SQL_INLINE_TABLE_VALUED_FUNCTION	Naming Conventions	Using Prefix in Name	Never use a prefix such as tbl, s
5	IDPrimaryKeyColumnNameSkipMe.ID	COLUMN	Naming Conventions	Using ID for Primary Key Column Name	Primary key column names sho
6	spPrefixNameSkipMe	SQL_STORED_PROCEDURE	Naming Conventions	Using Prefix in Name	Never use a prefix such as tbl, s
7	vPhoneSkipMe	VIEW	Naming Conventions	Using Prefix in Name	Never use a prefix such as tbl, s
8	(ContainsIllegalCharacters)	USER_TABLE	Naming Conventions	Including Special Characters in Name	Special characters should not b
9	1StartsWithANumber	USER_TABLE	Naming Conventions	Including Special Characters in Name	Special characters should not b
10	ColumnSameAsTable.ColumnSameAsTable	COLUMN	Naming Conventions	Column Named Same as Table	Do not give a table the same na
11	ColumnSameAsTable.ColumnSameAsTable	COLUMN	Naming Conventions	Column Naming	Avoid repeating the table name

About Me

- Hi, I'm Kevin Martin and I manage the SQL Server team at Emergent Software
- I specialize in SQL Server database development & administration
- I've done software & database development for most of my career, actively into my director level positions
- https://www.emergentsoftware.net/contact
- https://kevinmartin.tech
- https://www.linkedin.com/in/KevinMartinTech
- https://twitter.com/KevinMartinTech
- https://github.com/KevinMartinTech

About Emergent Software

- Microsoft Gold Partner born from Emergent Networks (now Presidio)
- We develop award-winning custom software
  - websites, system integrations, mobile & web apps, ongoing maintenance & support, and much more…
- SQL Server consulting
  - modeling, query & report writing, performance tuning, data warehouse, ETL, installs, patches, migrations, best practice assessments (configuration / health, index, database development, security, usage)
  - DBA Managed Service & DBA on Vacation Service

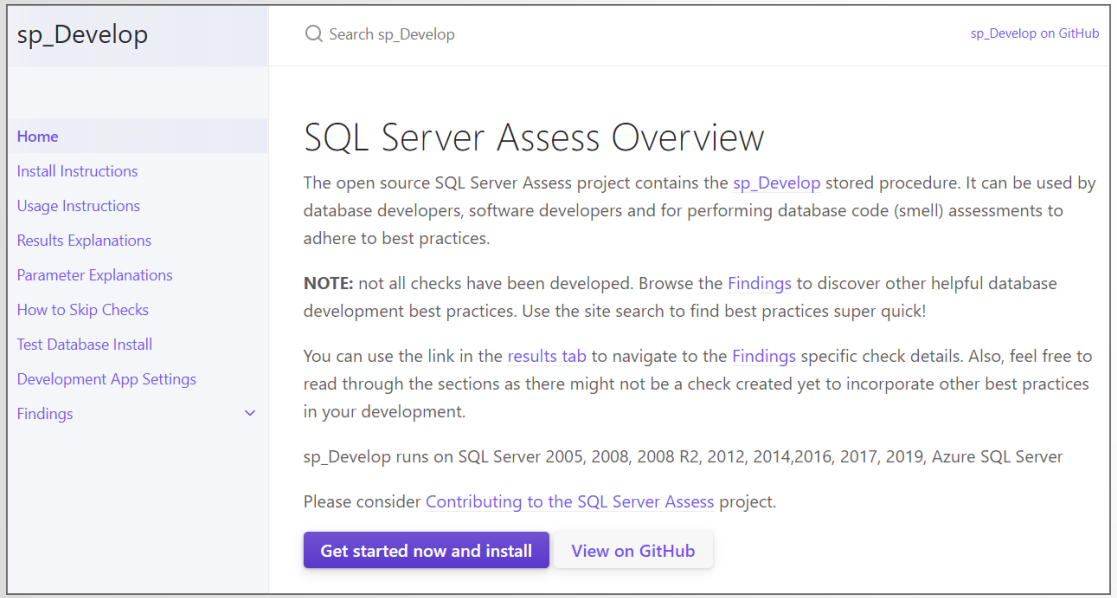
We Are Hiring

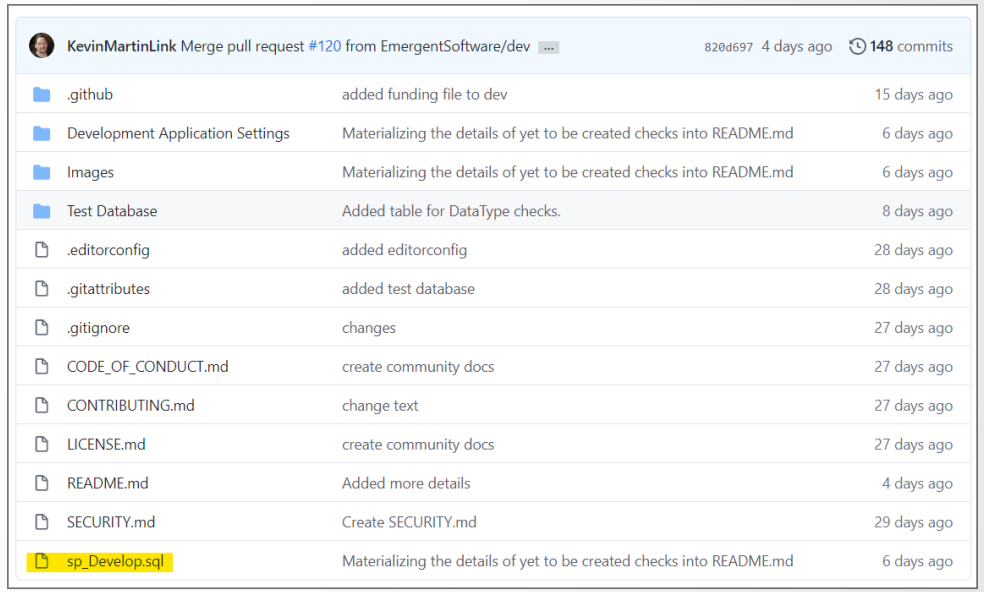
- Open Positions
  - Senior SQL Server Developer & DBA
  - Senior .NET Software Engineer
  - Account Executive
  - Senior Business Analyst, Software Development
- Why Work Here
  - **Variety of Work** – you are not performing the same 1 year of work, every year
  - **Flexibility** – healthy mix of office and remote for head-down time is best for our team, our clients, and us
  - **Growth** – surrounded by teammates who enjoy this type of work and share their knowledge
- Hiring Process
  - Pre-employment test
  - Extensive vetting process with virtual machine lab challenges (better than whiteboards during interviews)
  - Interview with multiple senior level experts

https://www.emergentsoftware.net/careers/

Where to Find sp_Develop

- Docs: https://emergentsoftware.github.io/SQL-Server-Development-Assessment/
- GitHub: https://github.com/EmergentSoftware/SQL-Server-Development-Assessment

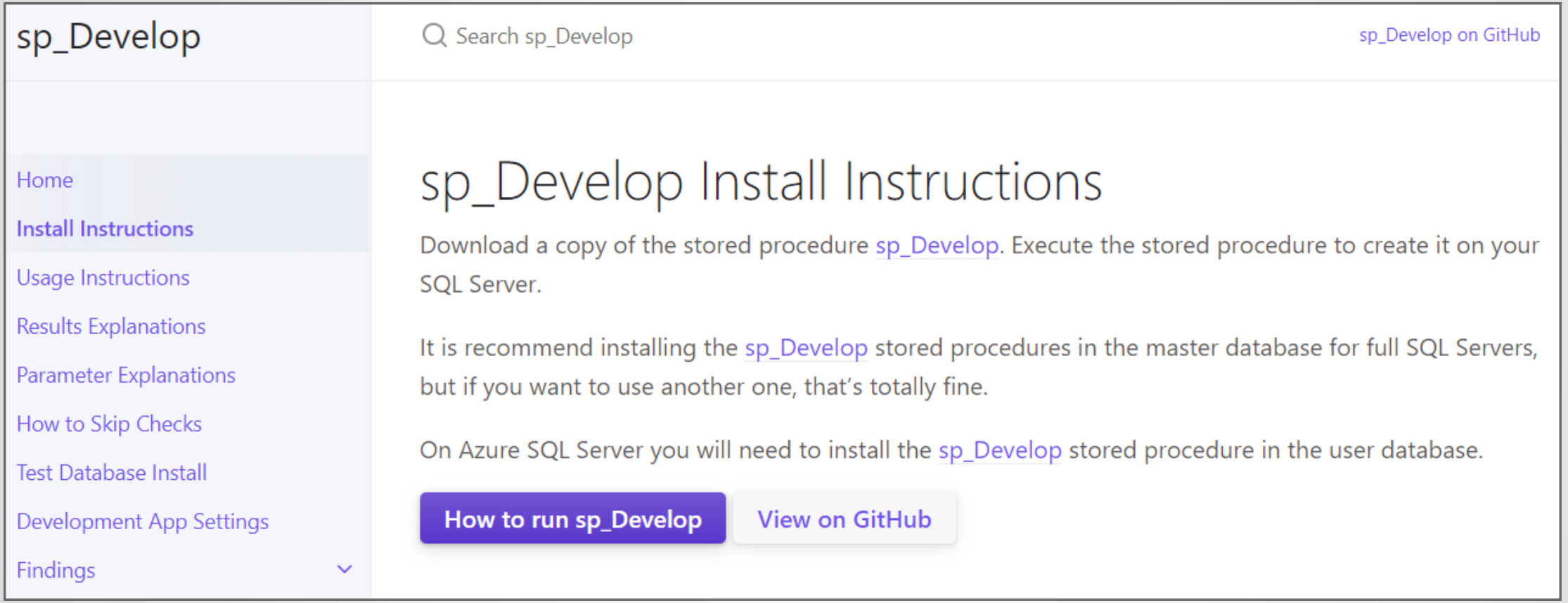




I'm planning to make a film series on databases.
I've got the first part ready, but I can't think of a SQL 😄

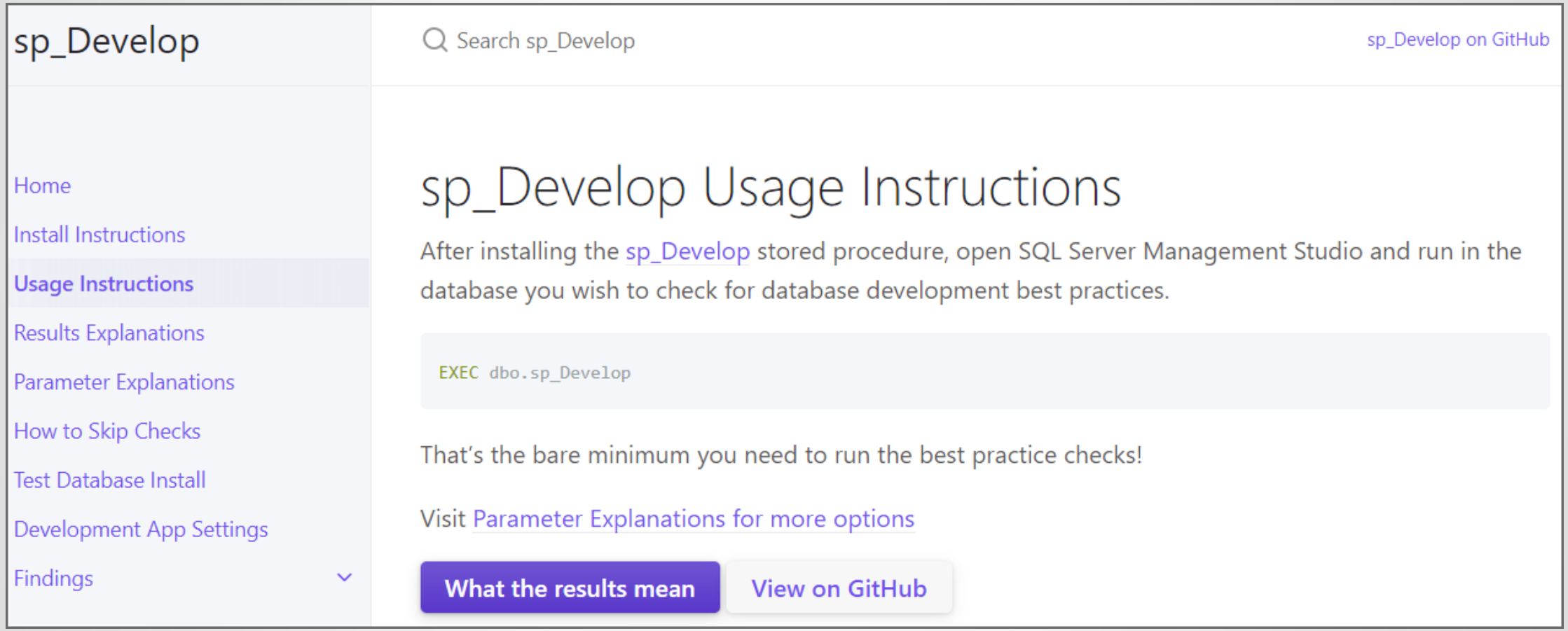
sp_Develop Install Instructions

- Visit: https://emergentsoftware.github.io/SQL-Server-Development-Assessment/install-instructions



sp_Develop Usage Instructions - Basic

- Visit: https://emergentsoftware.github.io/SQL-Server-Development-Assessment/usage-instructions



sp_Develop Results Explanations

- Visit: https://emergentsoftware.github.io/SQL-Server-Development-Assessment/results-explanations

Results Messages

	DatabaseName	SchemaName	ObjectName	ObjectType	FindingGroup	Finding	Details	URL	SkipCheckTSQL	Priority	CheckId
1	spDevelop	dbo	Users	USER_TABLE	Naming Conventions	Using Plural in Names	Table and view names should be singular	https://github.com/EmergentSoftware/SQL-Server-A...	INSERT INTO DBA.DevelopCheckToSkip (ServerName, ...	20	1
2	spDevelop	dbo	vwPhones	VIEW	Naming Conventions	Using Plural in Names	Table and view names should be singular	https://github.com/EmergentSoftware/SQL-Server-A...	INSERT INTO DBA.DevelopCheckToSkip (ServerName, ...	20	1

Column Name	Details
DatabaseName	Can be run for multiple databases, this shows you the database with the potential issue
SchemaName	This is the schema for the object that might have an issue
ObjectName	This can be anything from user tables, views stored procedures, functions, …
FindingGroup	The high-level grouping for the check (Naming Conventions, Table Conventions, Data Type Conventions, SQL Code Development, Data Issues, Configuration Issues, Running Issues)
Finding	The specific potential issue we the check is looking for
Details	Additional details about the potential issue. This does not go into in-depth details of the potential issue but should give you a heads up of what to look for
URL	Copy and paste this link into a browser to view the write up for the potential issue
SkipCheckTSQL	In this column you will find a generated TSQL script INSERT
Priority	The lower the number the more severe the potential issue is to address
CheckId	Every check is uniquely numbered

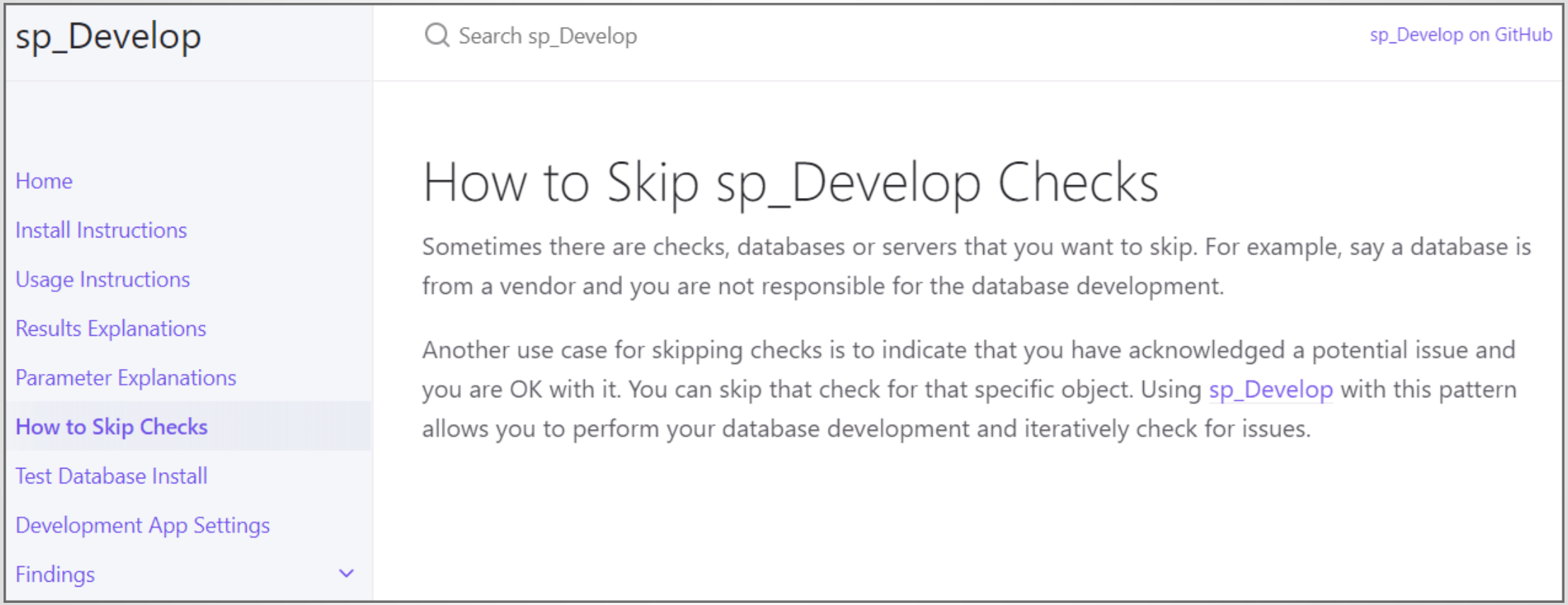
sp_Develop Parameters - Common

- Visit: https://emergentsoftware.github.io/SQL-Server-Development-Assessment/parameter-explanations

Parameter	Details
@DatabaseName	Defaults to current DB if not specified
@GetAllDatabases	Setting = 1, runs checks across all the databases on the server instead of just your current database context. Does not work on Azure SQL Server.
@BringThePain	If you've got more than 50 databases on the server, this only works if you also pass in @BringThePain = 1, because it's gonna be slow.
@OutputType	TABLE = table COUNT = row with number found MARKDOWN = bulleted list XML = table output as XML NONE = none
@Debug	Default 0. When 1, we print out messages of what we're doing in the messages tab of SQL Server Management Studio. When 2, we print out the dynamic SQL query of the check.

sp_Develop Parameters - Skip Checks 1 of 4

- Visit: https://emergentsoftware.github.io/SQL-Server-Development-Assessment/how-to-skip-checks



Why did the database administrator leave his wife?
She had one-to-many relationships.😄

sp_Develop Parameters - Skip Checks 2 of 4

- Visit: https://emergentsoftware.github.io/SQL-Server-Development-Assessment/how-to-skip-checks

Create a table to hold the list of checks you want to skip

Create this table in the database you are developing or in a database on a centralized SQL Server.

```
CREATE TABLE dbo.DevelopCheckToSkip (
    DevelopCheckToSkipId INT           IDENTITY(1, 1) NOT NULL
   ,ServerName           NVARCHAR(128) NULL
   ,DatabaseName         NVARCHAR(128) NULL
   ,SchemaName           NVARCHAR(128) NULL
   ,ObjectName           NVARCHAR(128) NULL
   ,CheckId              INT           NULL
   ,CONSTRAINT DevelopCheckToSkipId PRIMARY KEY CLUSTERED (DevelopCheckToSkipId ASC)
);
GO
```

sp_Develop Parameters - Skip Checks 3 of 4

- Visit: https://emergentsoftware.github.io/SQL-Server-Development-Assessment/how-to-skip-checks

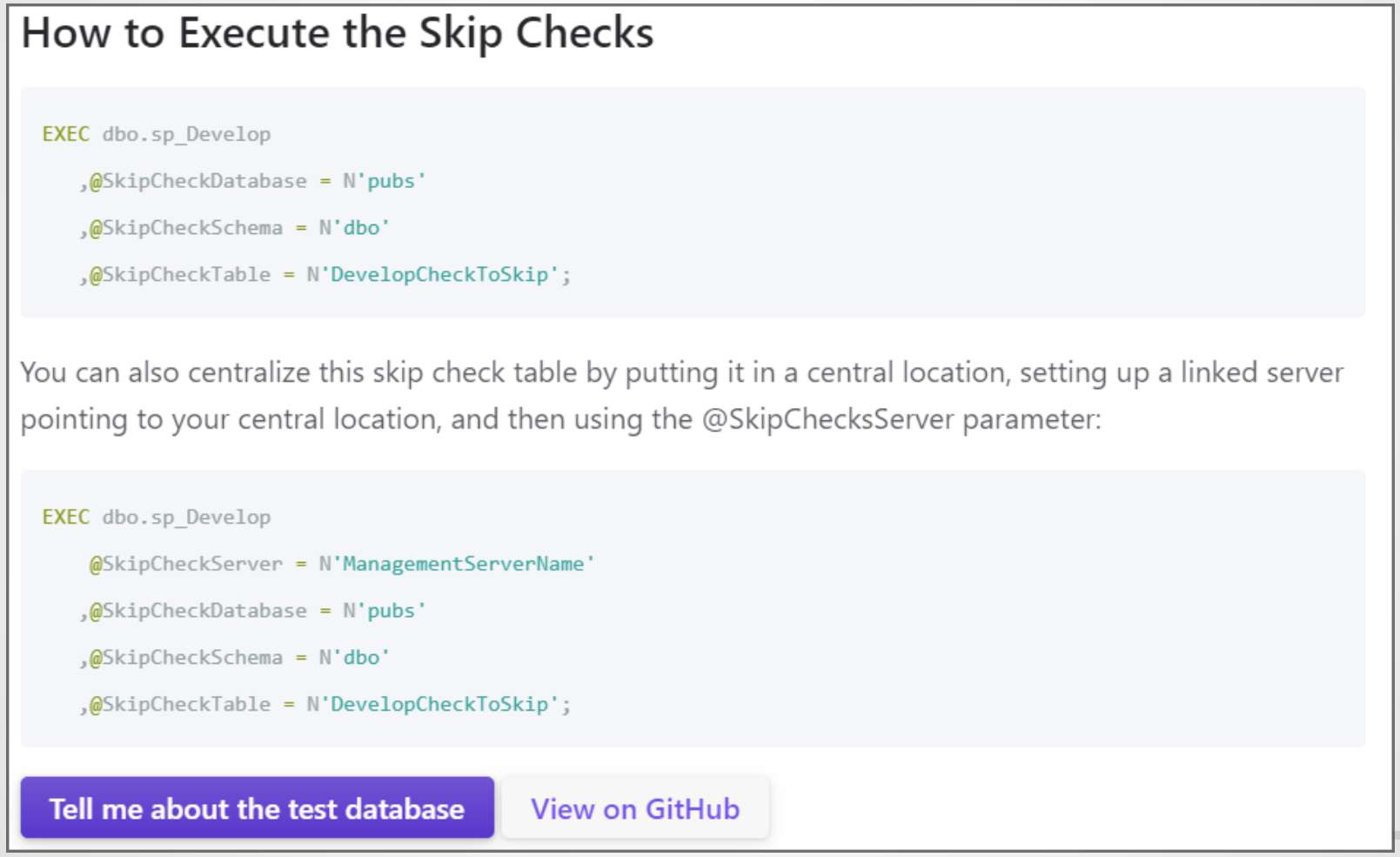
Results | Messages

	SkipCheckTSQL
1	INSERT INTO DBA.DevelopCheckToSkip (ServerName, DatabaseName, SchemaName, ObjectName, CheckId) VALUES (N'FAMILY\SQL2019', N'spDevelopTest', N'dbo', N'(ContainsIllegalCharacters)', 5);
2	INSERT INTO DBA.DevelopCheckToSkip (ServerName, DatabaseName, SchemaName, ObjectName, CheckId) VALUES (N'FAMILY\SQL2019', N'spDevelopTest', N'dbo', N'1StartsWithANumber', 5);
3	INSERT INTO DBA.DevelopCheckToSkip (ServerName, DatabaseName, SchemaName, ObjectName, CheckId) VALUES (N'FAMILY\SQL2019', N'spDevelopTest', N'dbo', N'ColumnSameAsTable.ColumnSame
4	INSERT INTO DBA.DevelopCheckToSkip (ServerName, DatabaseName, SchemaName, ObjectName, CheckId) VALUES (N'FAMILY\SQL2019', N'spDevelopTest', N'dbo', N'ColumnSameAsTable.ColumnSame

```
INSERT INTO
    dbo.DevelopCheckToSkip (ServerName, DatabaseName, SchemaName, ObjectName, CheckId)
VALUES
    /* Skips all checks, for every database, on the SQL2008 SQL Server */
  (N'SQL2008', NULL, NULL, NULL, NULL)
    /* Skips all checks, in the AdventureWorks2012 database, on the SQL2012 SQL Server */
  ,(N'SQL2012', N'AdventureWorks2012', NULL, NULL, NULL)
    /* Skips all checks, for the object named dbo.fn_TPSTotal, in the AdventureWorks2017 database, on
       the SQL2017 SQL Server */
  ,(N'SQL2017', N'AdventureWorks2017', N'dbo', N'fn_TPSTotal', NULL)
    /* Skips CheckId 5 (Including Special Characters in Name), for the object named dbo.[Order Details],
       in the Northwind database, on the SQL2019 SQL Server*/
  ,(N'SQL2019', N'Northwind', N'dbo', N'Order Details', 5)
    /* Skips all checks, in the AdventureWorks2017 database, on every SQL Server */
  ,(NULL, N'AdventureWorks2017', NULL, NULL, NULL)
    /* Skips all checks, for the object named dbo.vPhone, in every database, on every SQL Server */
  ,(NULL, NULL, N'dbo', N'vPhone', NULL)
    /* Skips CheckId 19 (Not Using SET NOCOUNT ON in Stored Procedure or Trigger), for the object
       dbo.CustOrderHist, in every database, on every SQL Server */
  ,(NULL, NULL, N'dbo', N'CustOrderHist', 19);
GO
```

sp_Develop Parameters - Skip Checks 4 of 4

- Visit: https://emergentsoftware.github.io/SQL-Server-Development-Assessment/how-to-skip-checks



How to Execute the Skip Checks

```
EXEC dbo.sp_Develop
    ,@SkipCheckDatabase = N'pubs'
    ,@SkipCheckSchema = N'dbo'
    ,@SkipCheckTable = N'DevelopCheckToSkip';
```

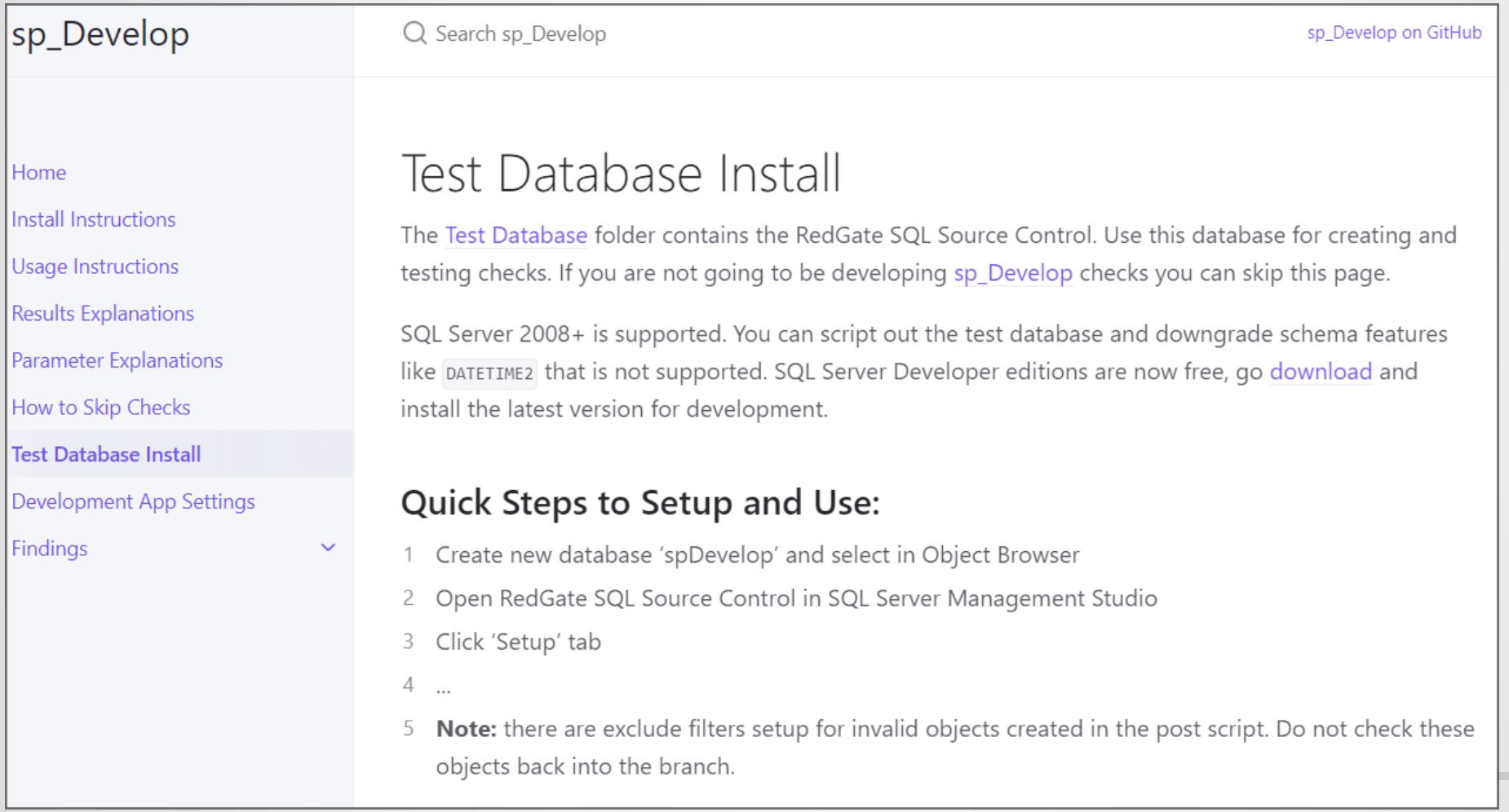
You can also centralize this skip check table by putting it in a central location, setting up a linked server pointing to your central location, and then using the @SkipChecksServer parameter:

```
EXEC dbo.sp_Develop
     @SkipCheckServer = N'ManagementServerName'
    ,@SkipCheckDatabase = N'pubs'
    ,@SkipCheckSchema = N'dbo'
    ,@SkipCheckTable = N'DevelopCheckToSkip';
```

Tell me about the test database | View on GitHub

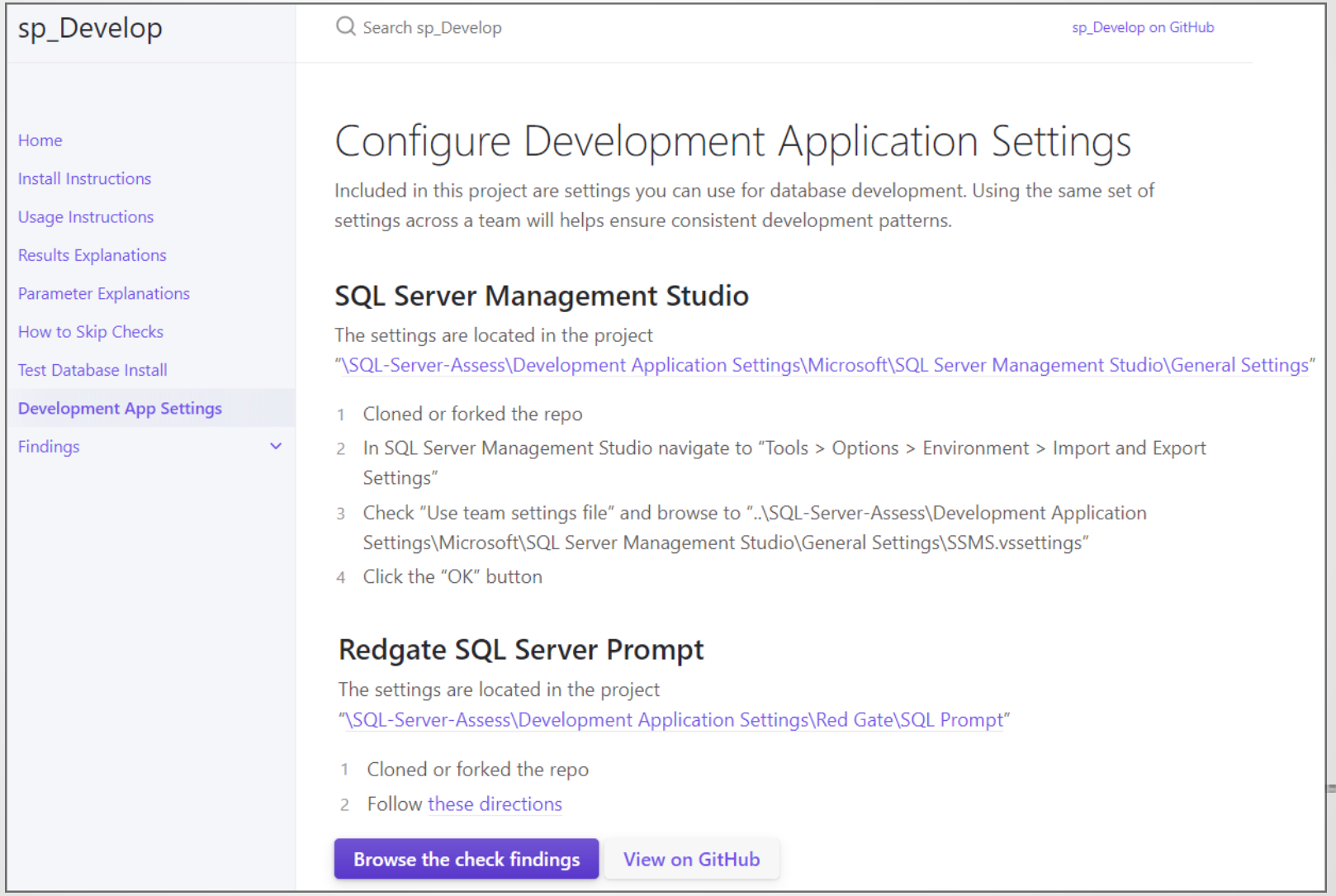
sp_Develop Test Database Install

- Visit: https://emergentsoftware.github.io/SQL-Server-Development-Assessment/test-database-install



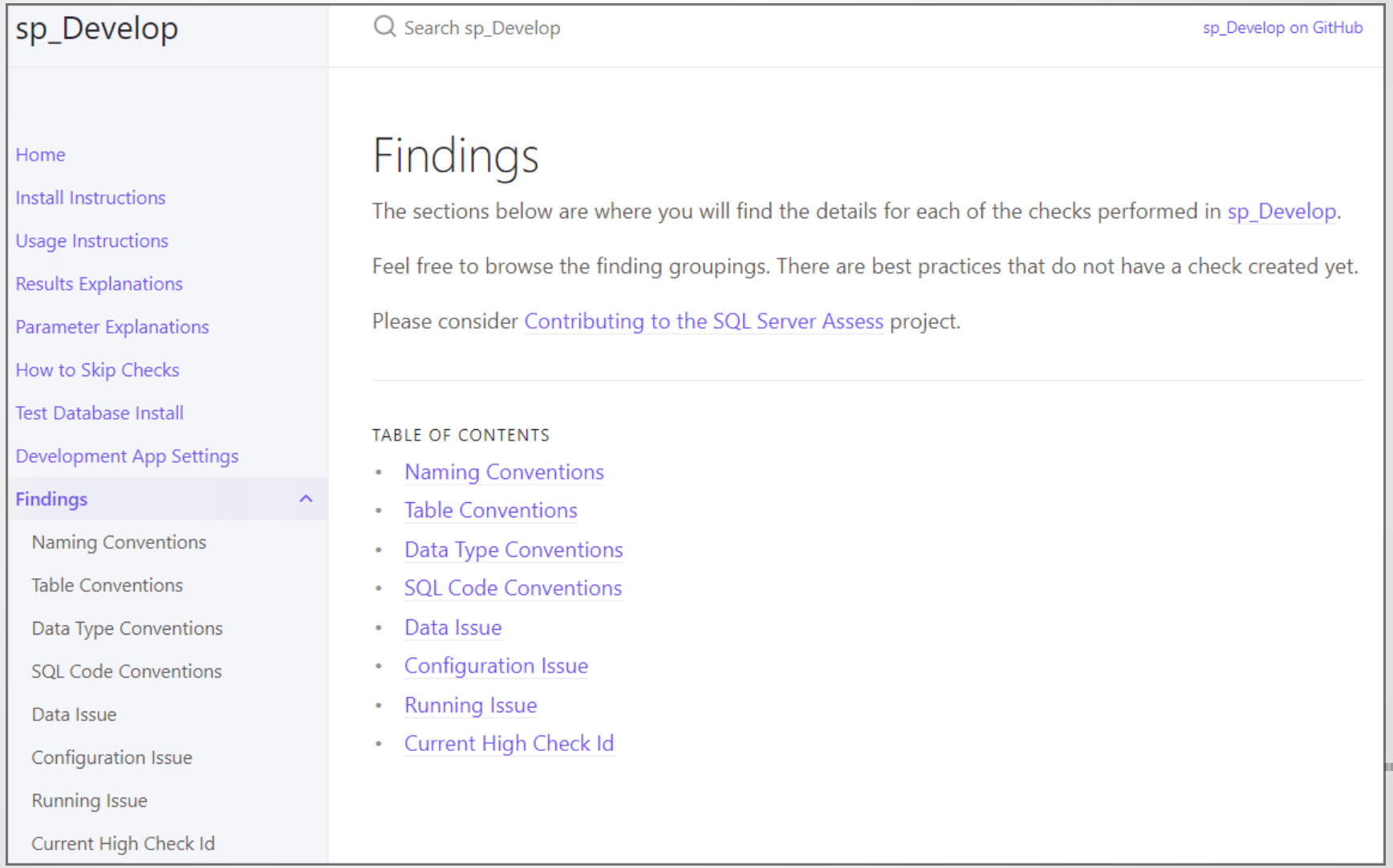
Development Application Settings Share

- Visit: https://emergentsoftware.github.io/SQL-Server-Development-Assessment/development-app-settings



Check Findings

- Visit: https://emergentsoftware.github.io/SQL-Server-Development-Assessment/best-practices-and-potential-findings/sql-code-conventions



Check Findings – Naming Conventions

- Visit: https://emergentsoftware.github.io/SQL-Server-Development-Assessment/best-practices-and-potential-findings/naming-conventions

sp_Develop

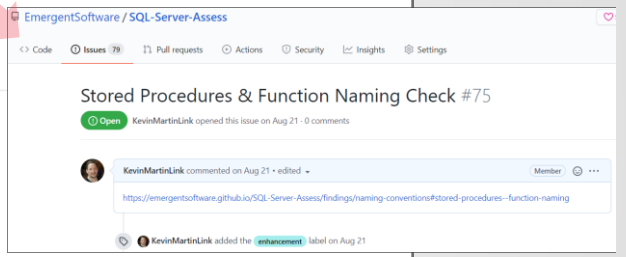
TABLE OF CONTENTS

Stored Procedures & Function Naming

Check Id: None yet, click here to view the issue

Stored procedures and functions should be named so they can be ordered by the table/business entity (ObjectAction) they perform a database operation on, and adding the database activity "Get, Update, Insert, Upsert, Delete, Merge" as a suffix, e.g., ("ProductGet" or "OrderUpdate").

Back to top



Using ID for Primary Key Column Name

Check Id: 7

For columns that are the primary key for a table and uniquely identify each record in the table, the name should be [TableName] + "Id" (e.g. On the Make table, the primary key column would be "MakeId").

Though "MakeId" conveys no more information about the field than Make.Id and is a far wordier implementation, it is still preferable to "Id".

Naming a primary key column "Id" is also "bad" when you query from several tables you will need to rename the "Id" columns so you can distinguish them in result set.

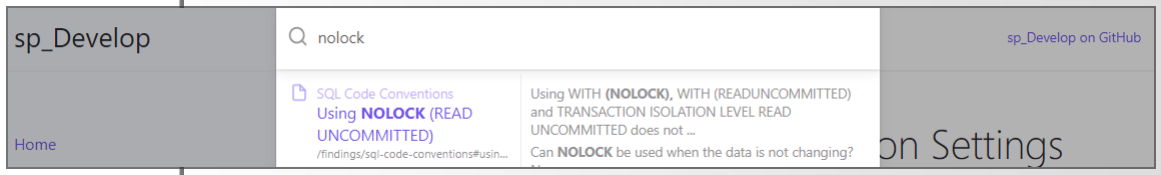
With different column names in joins masks errors.

```
/* This has an error that is not obvious at first sight */

SELECT
    C.Name
```

Check Findings – Table Conventions

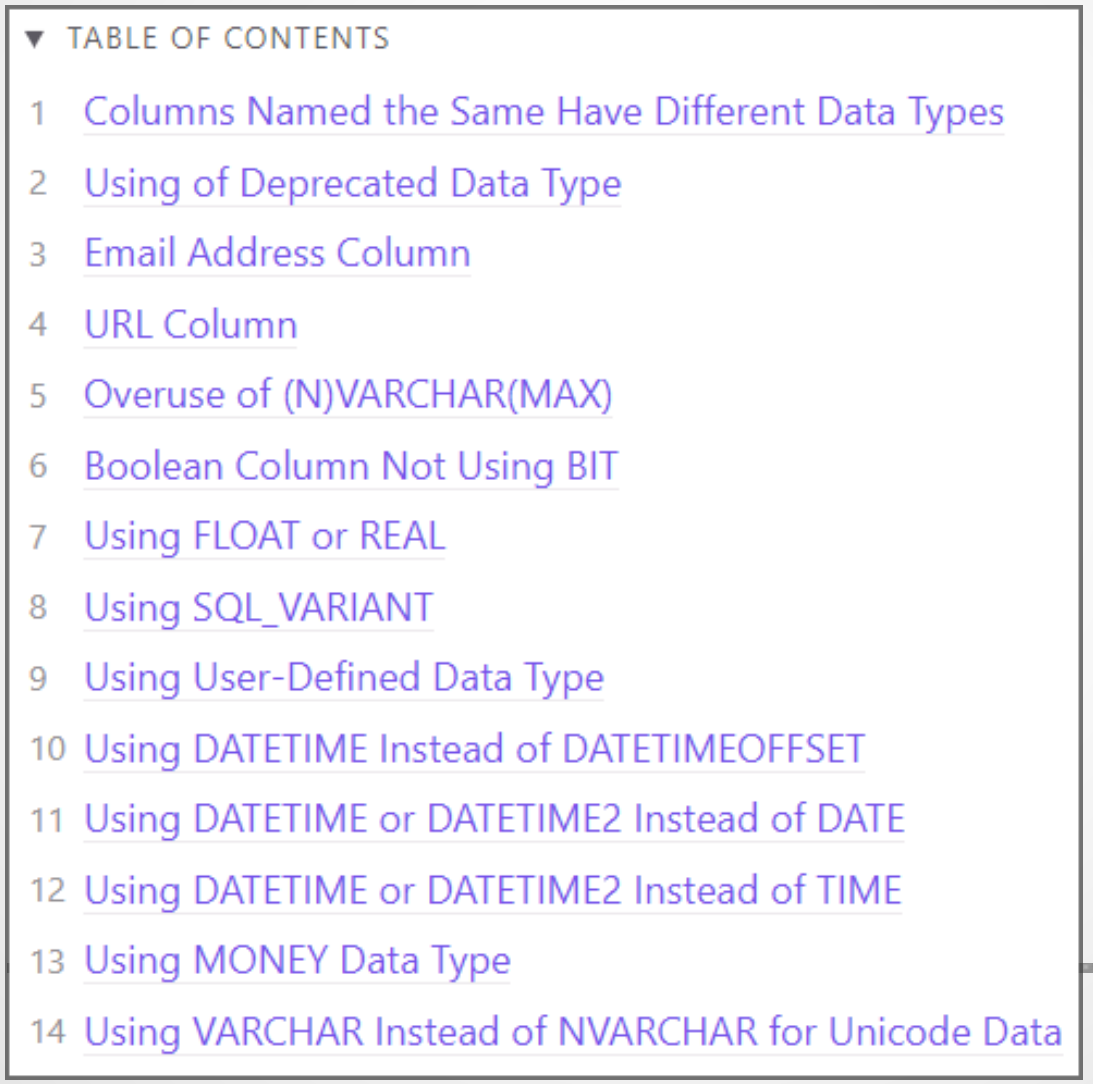
- Visit: https://emergentsoftware.github.io/SQL-Server-Development-Assessment/best-practices-and-potential-findings/table-conventions

TABLE OF CONTENTS



Check Findings – Data Type Conventions

- Visit: https://emergentsoftware.github.io/SQL-Server-Development-Assessment/best-practices-and-potential-findings/data-type-conventions



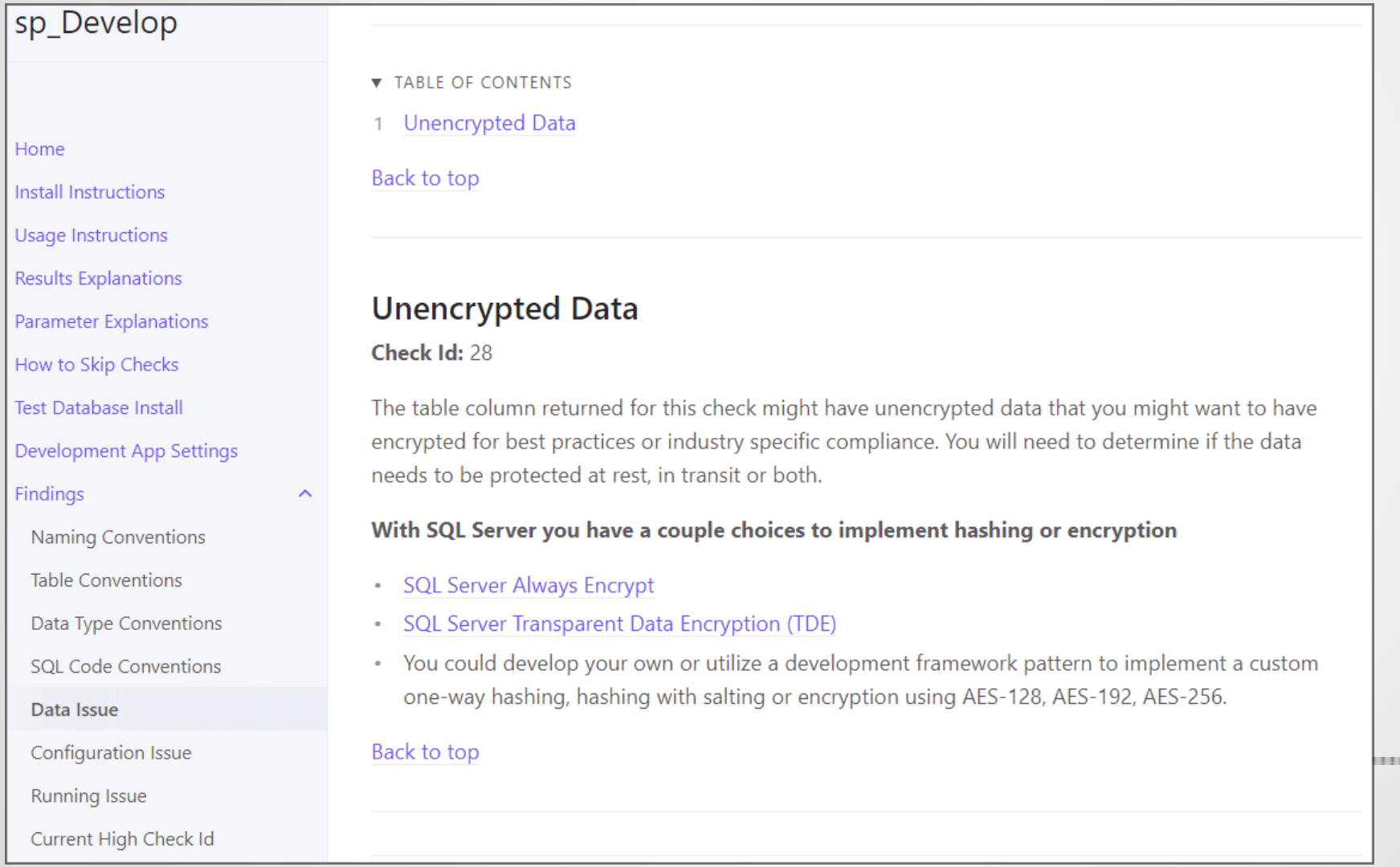
Check Findings – SQL Code Conventions

- Visit: https://emergentsoftware.github.io/SQL-Server-Development-Assessment/best-practices-and-potential-findings/sql-code-conventions

TABLE OF CONTENTS

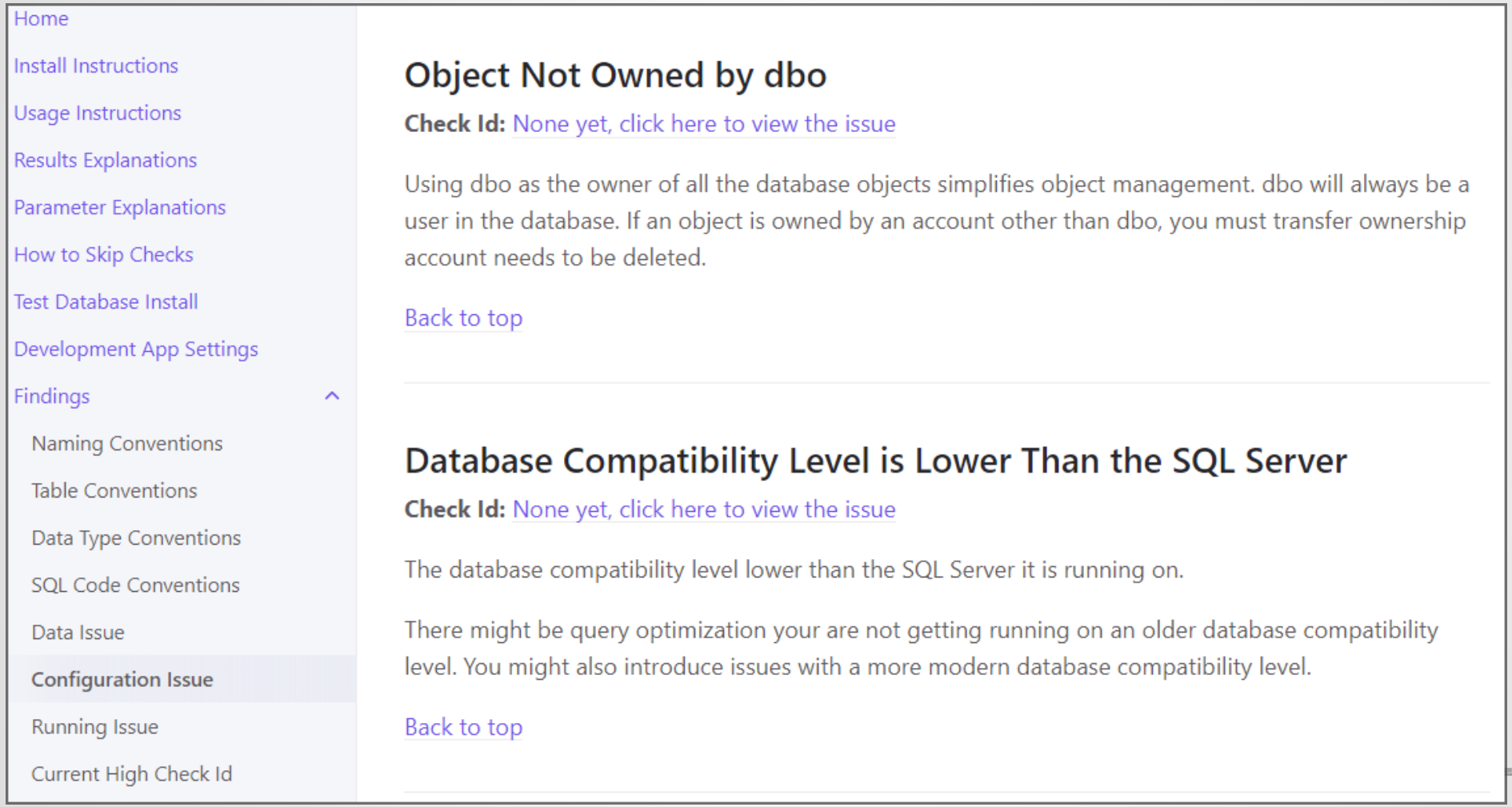
Check Findings – Data Issues

- Visit: https://emergentsoftware.github.io/SQL-Server-Development-Assessment/best-practices-and-potential-findings/data-issues



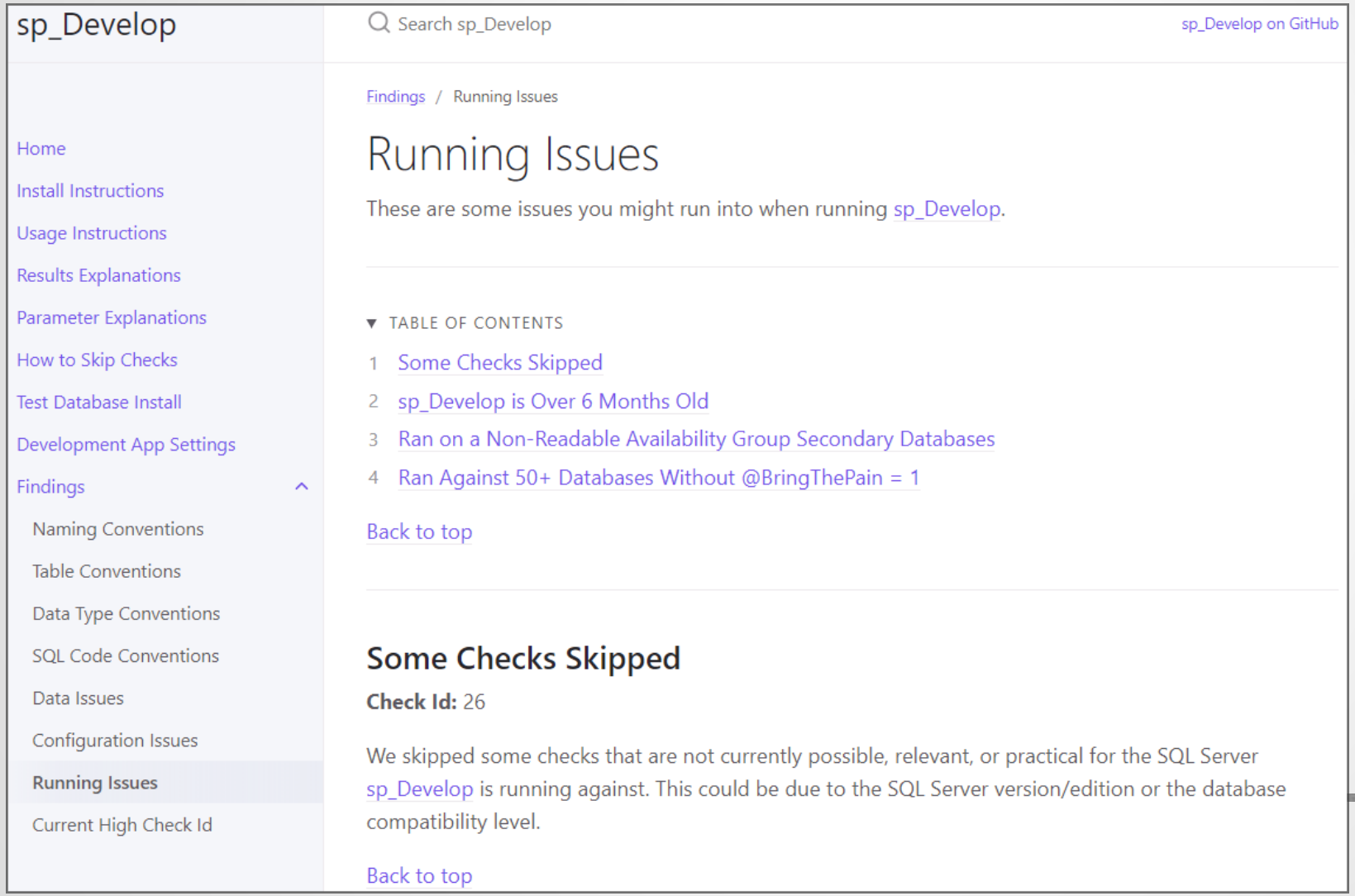
Check Findings – Configuration Issues

- Visit: https://emergentsoftware.github.io/SQL-Server-Development-Assessment/best-practices-and-potential-findings/configuration-issues



Check Findings – Running Issues

- Visit: https://emergentsoftware.github.io/SQL-Server-Development-Assessment/best-practices-and-potential-findings/running-issues

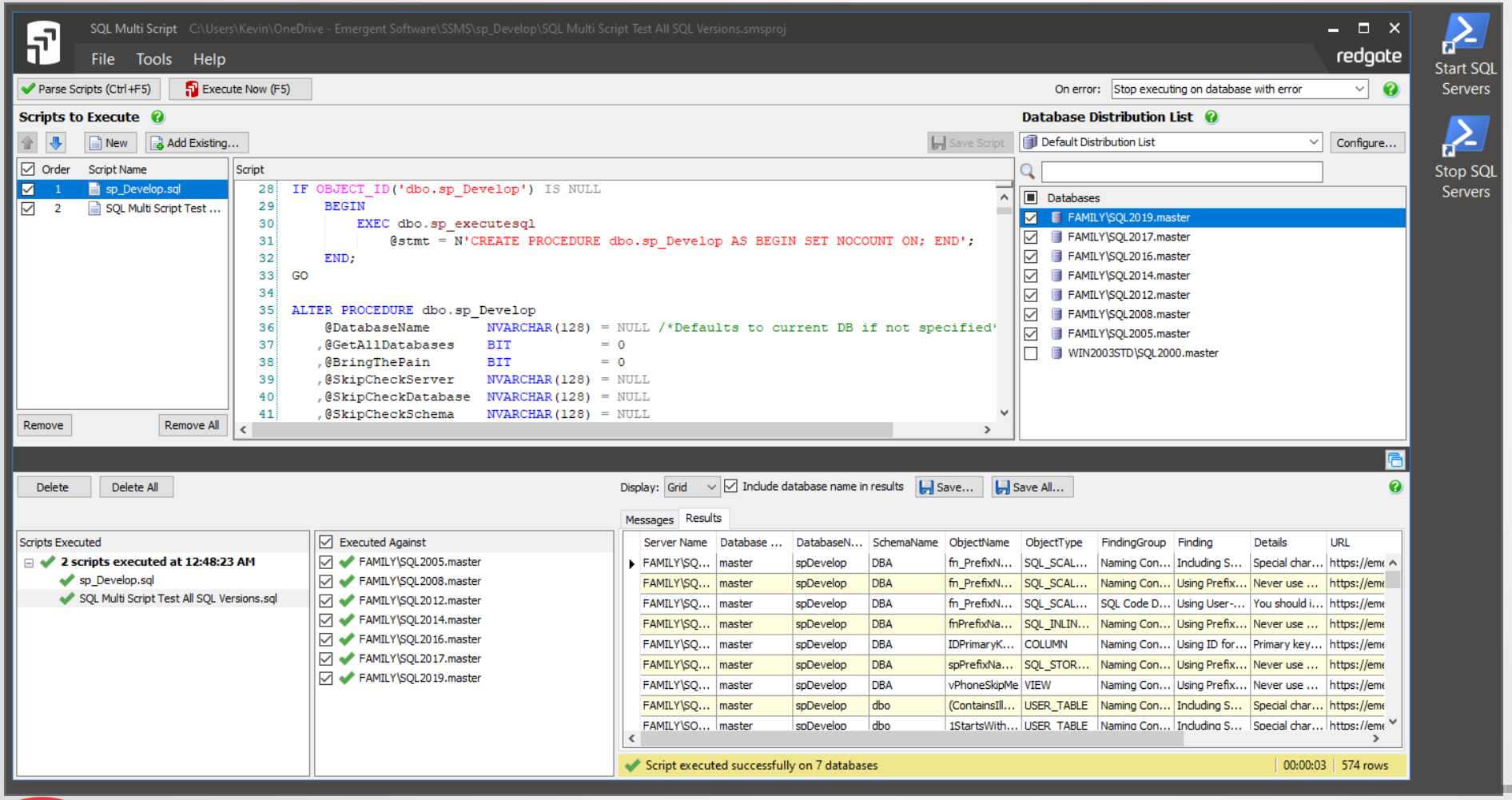


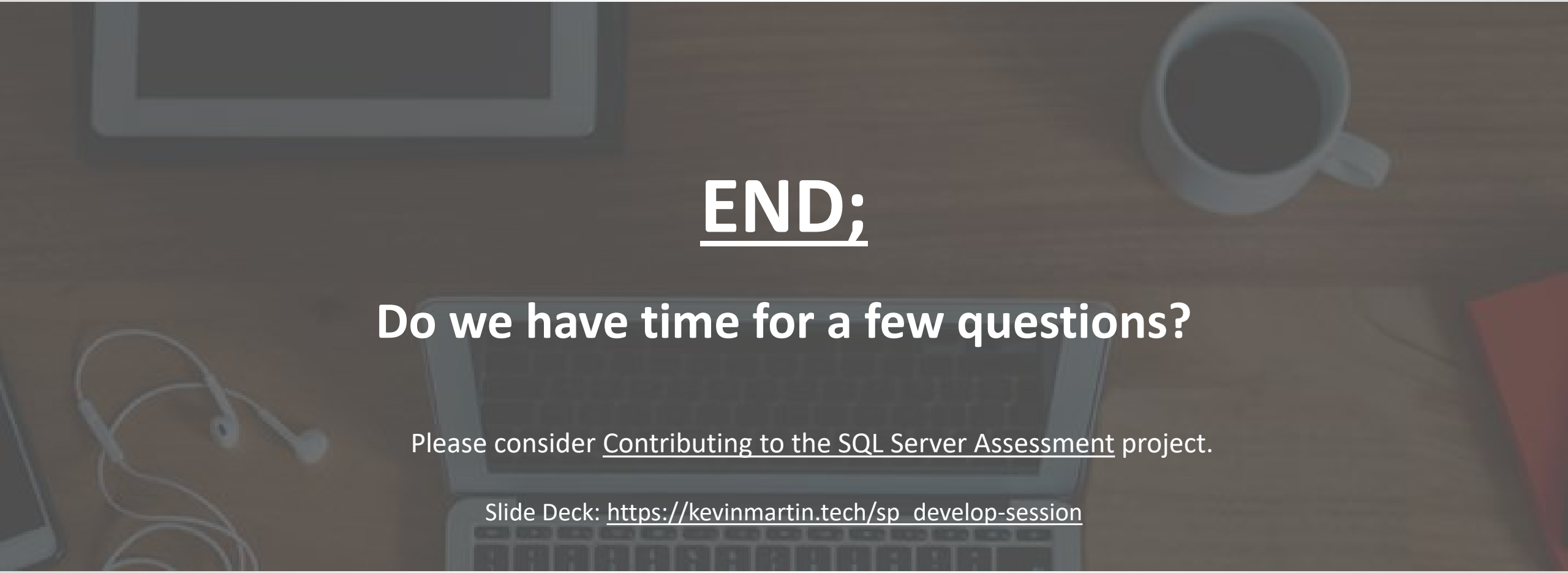
Check Code Sample

```
/****************************************************************************************************************************************************/
SELECT
    @CheckId        = 1
   ,@Priority       = 20
   ,@FindingGroup   = 'Naming Conventions'
   ,@Finding        = 'Using Plural in Names'
   ,@URLAnchor      = 'naming-conventions#using-plural-in-name';
/****************************************************************************************************************************************************/
IF NOT EXISTS (SELECT 1 FROM #SkipCheck AS SC WHERE SC.CheckId = @CheckId AND SC.ObjectName IS NULL)
BEGIN
    IF @Debug IN (1, 2) RAISERROR(N'Running CheckId [%d]', 0, 1, @CheckId) WITH NOWAIT;

    SET @StringToExecute = N'
        INSERT INTO
            #Finding (CheckId, Database_Id, DatabaseName, FindingGroup, Finding, URL, Priority, Schema_Id, SchemaName,
             Object_Id, ObjectName, ObjectType, Details)
        SELECT
            CheckId       = ' + CAST(@CheckId AS NVARCHAR(MAX)) + N'
           ,Database_Id   = ' + CAST(@DatabaseId AS NVARCHAR(MAX)) + N'
           ,DatabaseName  = ''' + CAST(@DatabaseName AS NVARCHAR(MAX)) + N'''
           ,FindingGroup  = ''' + CAST(@FindingGroup AS NVARCHAR(MAX)) + N'''
           ,Finding       = ''' + CAST(@Finding AS NVARCHAR(MAX)) + N'''
           ,URL           = ''' + CAST(@URLBase + @URLAnchor AS NVARCHAR(MAX)) + N'''
           ,Priority      = ' + CAST(@Priority AS NVARCHAR(MAX)) + N'
           ,Schema_Id     = S.schema_id
           ,SchemaName    = S.name
           ,Object_Id     = O.object_id
           ,ObjectName    = O.name
           ,ObjectType    = O.type_desc
           ,Details       = N''Table and view names should be singular''
        FROM
            ' + QUOTENAME(@DatabaseName) + N'.sys.objects AS O
            INNER JOIN ' + QUOTENAME(@DatabaseName) + N'.sys.schemas AS S ON S.schema_id = O.schema_id
        WHERE
            O.type IN (''U'', ''V'')
            AND RIGHT(O.name COLLATE SQL_Latin1_General_CP1_CI_AS, 1) = ''S''
            AND RIGHT(O.name COLLATE SQL_Latin1_General_CP1_CI_AS, 2) <> ''SS''
            AND O.NAME NOT IN (''sysdiagrams'', ''database_firewall_rules'');';

    EXEC sys.sp_executesql @stmt = @StringToExecute;
    IF @Debug = 2 AND @StringToExecute IS NOT NULL PRINT @StringToExecute;
END;
```

Testing on Multiple SQL Server Versions

- Visit: https://my.visualstudio.com/Downloads?q=SQL%20Server%20Developer





Emergent Software

END;

Do we have time for a few questions?

Please consider Contributing to the SQL Server Assessment project.

Slide Deck: https://kevinmartin.tech/sp_develop-session

Alexa, do you have a boyfriend?
I'll leave the relations to the databases. 😁