Microsoft Azure SQL database setup

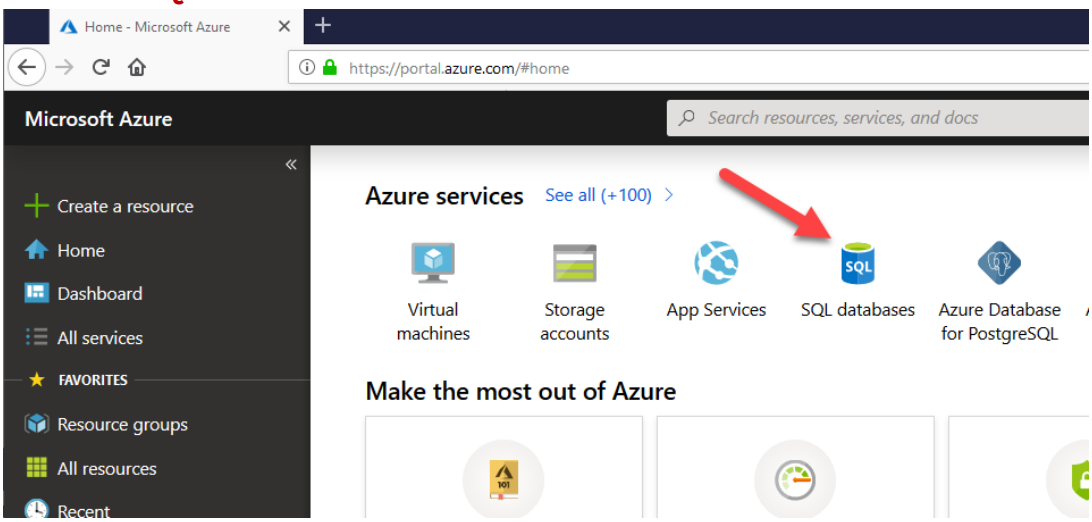
Prerequisites

Setup an Azure for Students (not Azure for Students Starter) account. If based in Ireland at time of signup: https://azure.microsoft.com/en-ie/free/students/

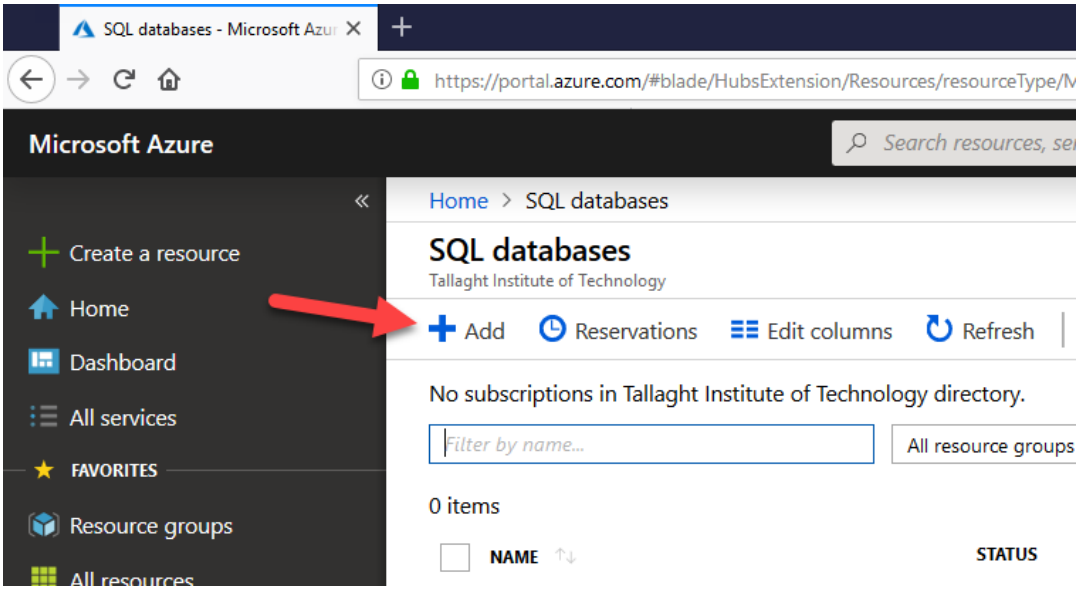
Create a new Azure SQL database

1. Login to your account: https://portal.azure.com

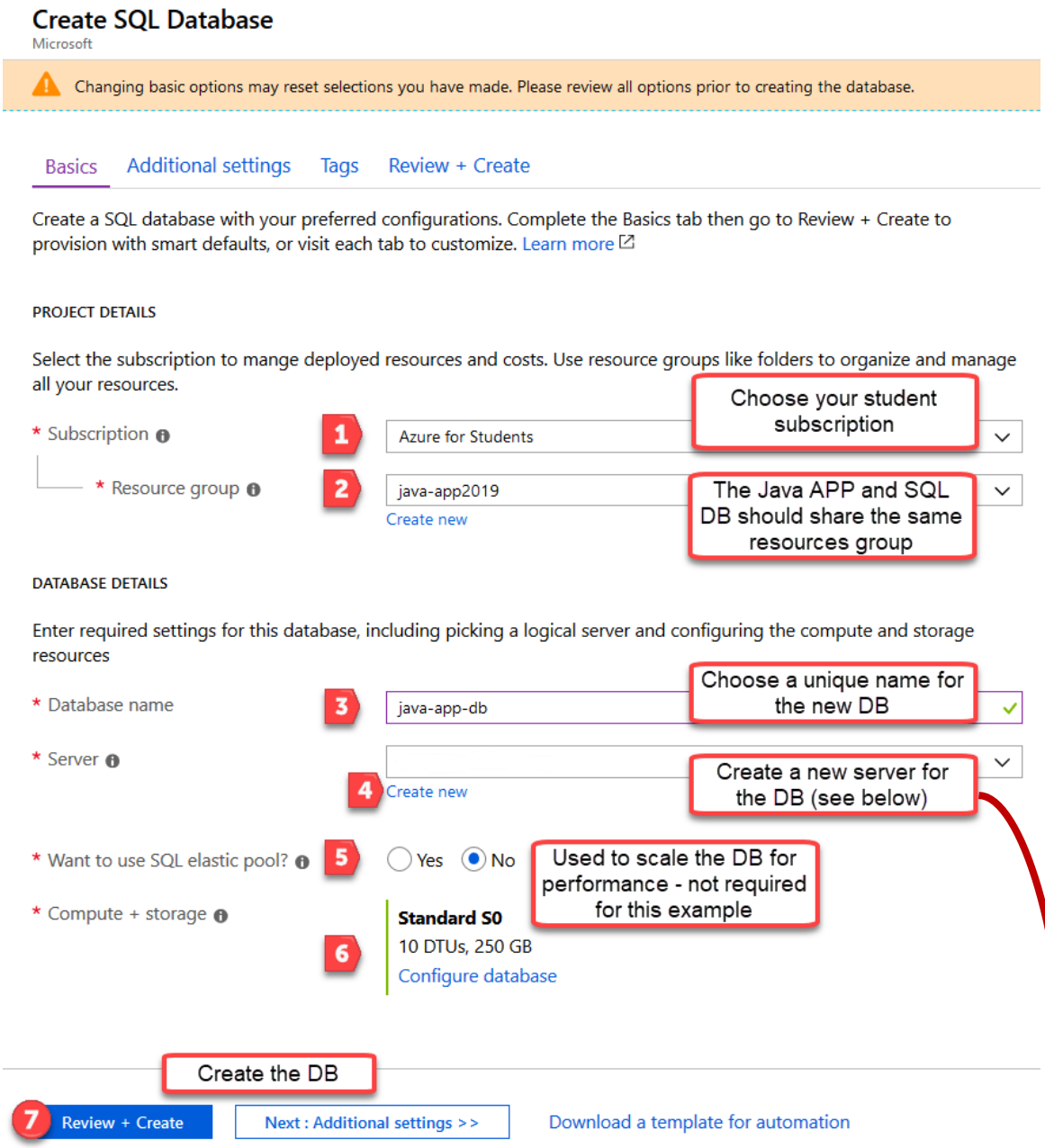
2. Click the **SQL databases** link



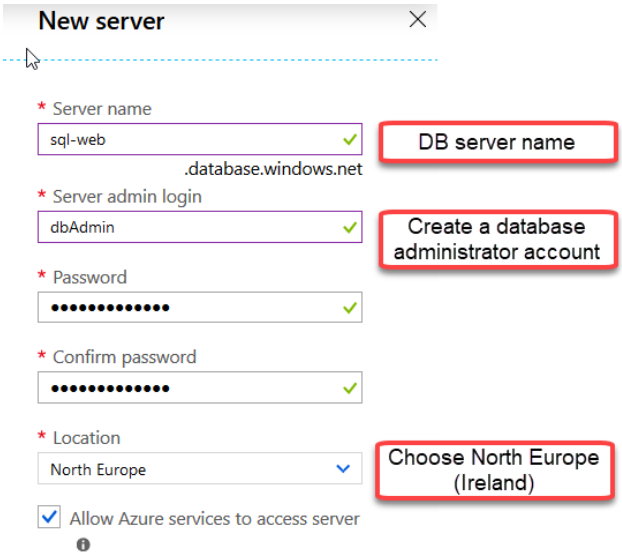
3. Click **+ Add** to start creating a new app



4. Fill the `Create SQL Database` form

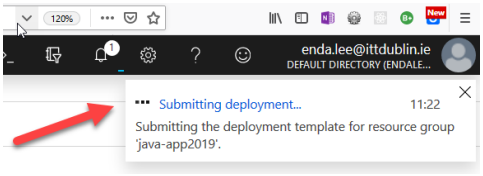


Create new server options:

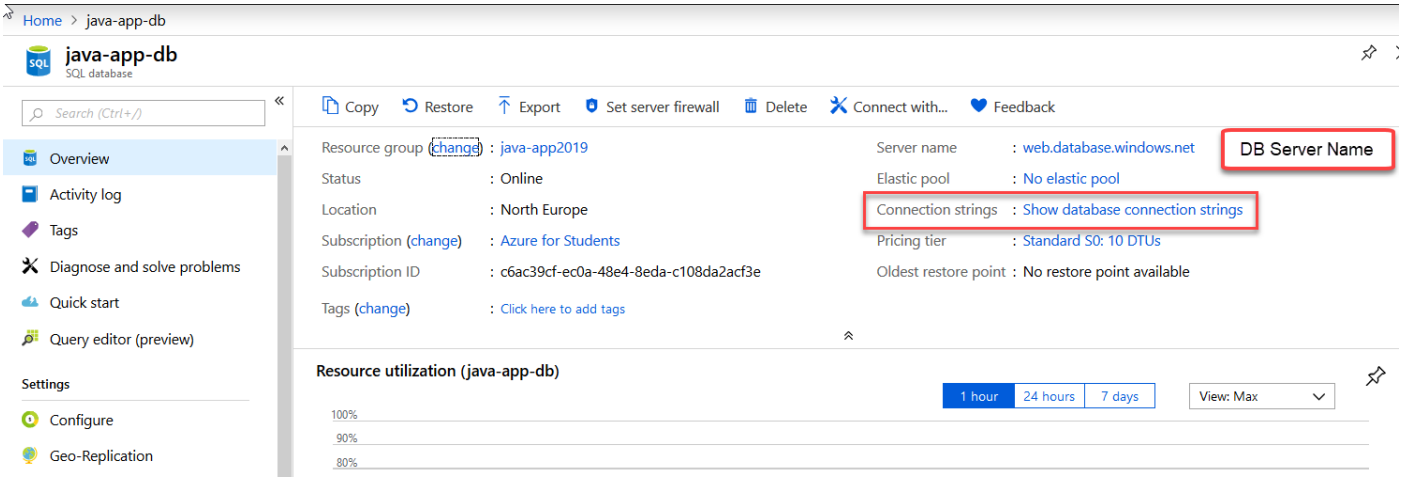


5. Review and Create

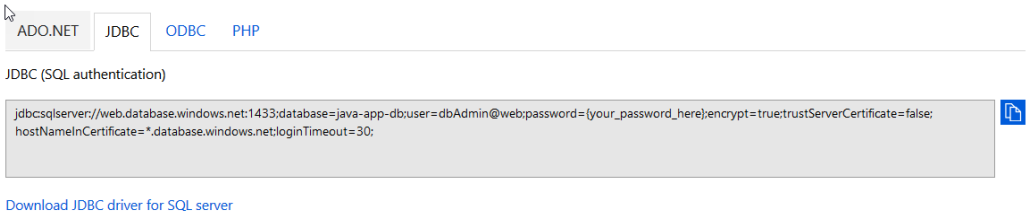
A summary, based on your chosen options, will be displayed. If correct, click the create button. It will take a few minutes to deploy the new database.



When complete, the new DB can be opened. Note the server name. Choose configure (under settings) to change the DB plan.

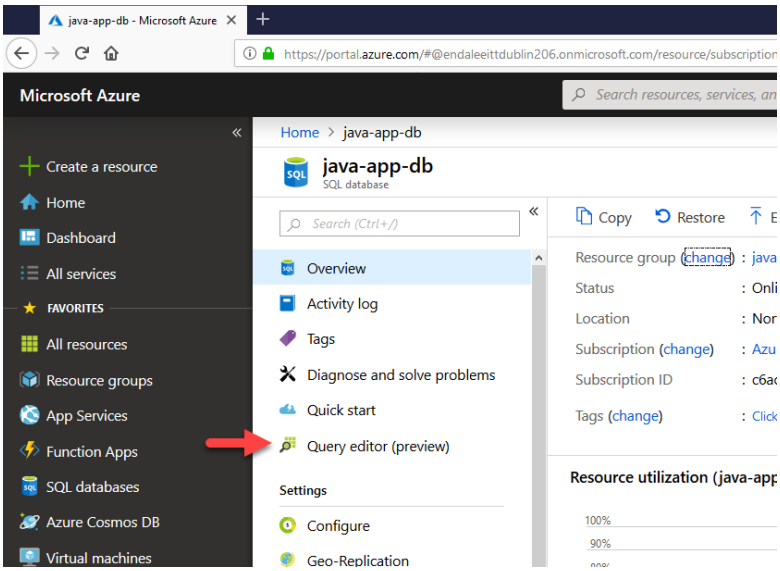


See connection strings for details of how to connect to the DB from applications – e.g.

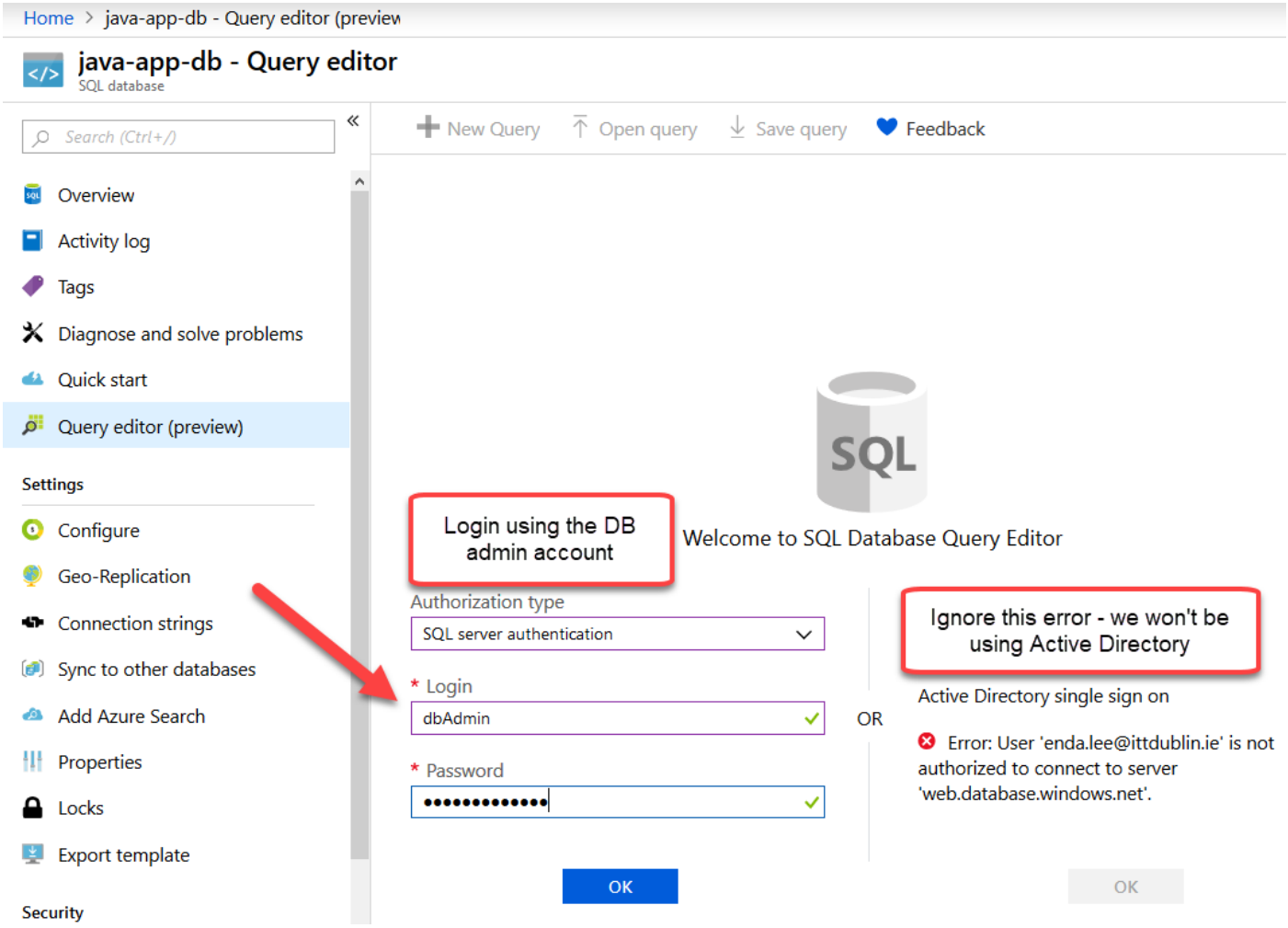


Adding tables and data

We will use the built in `Query Editor`, available from the database management links in Azure. The query editor provides basic features, for more advanced tools see the bibliography.

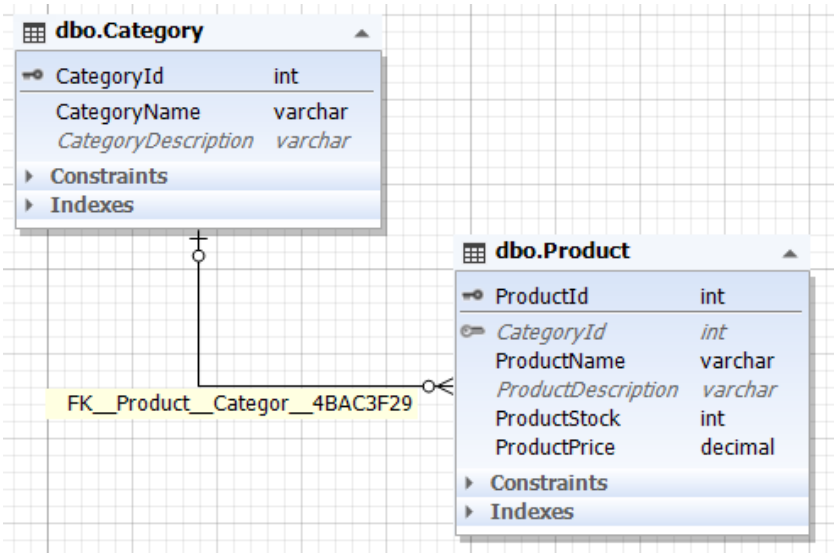


1. Login



2. Database Tables and data

We will create two tables, `Category` and `Product`, with a `one-to-many` relationship



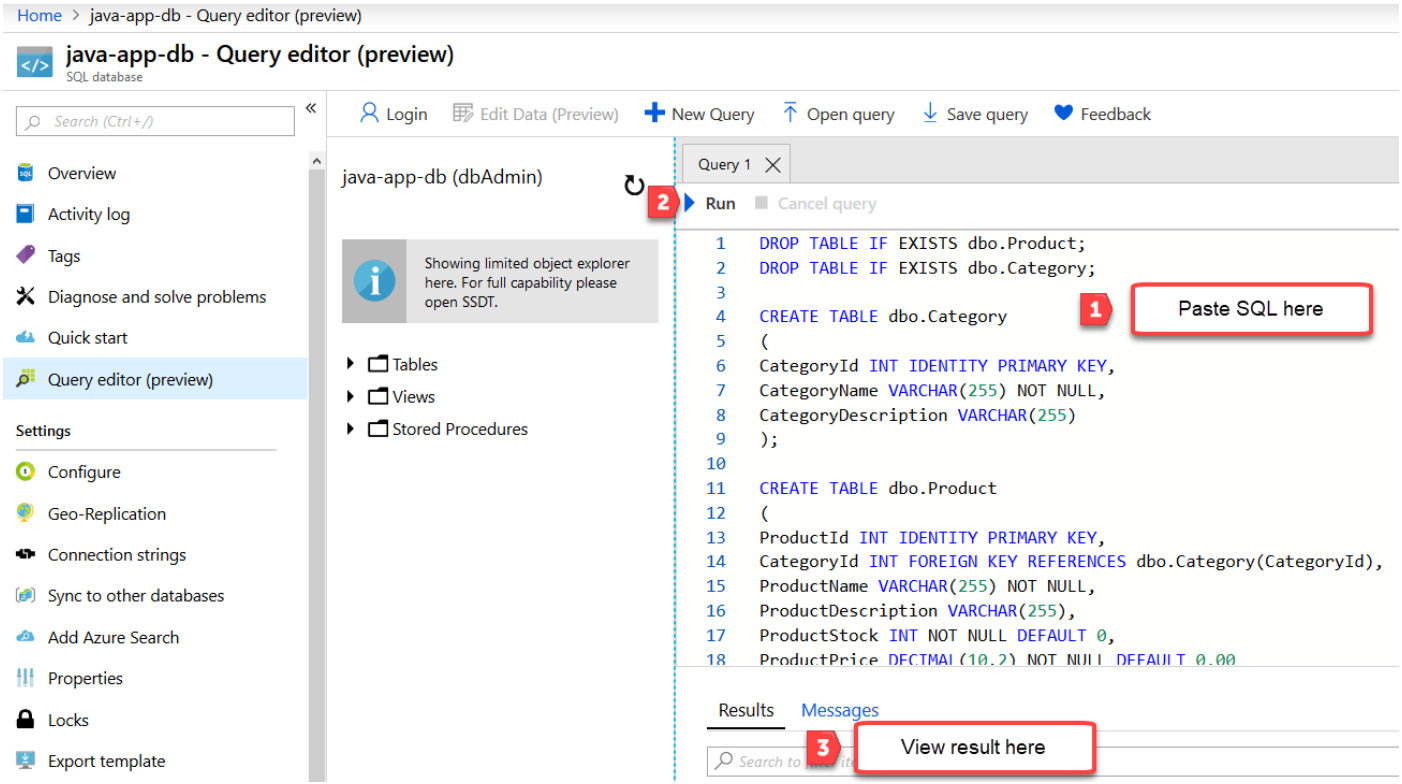
here is also sample data for each table. Get the SQL from

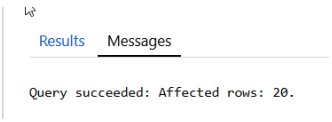
https://github.com/COM673/2019-Week3-SQLDB/blob/master/db.sql

Execute queries

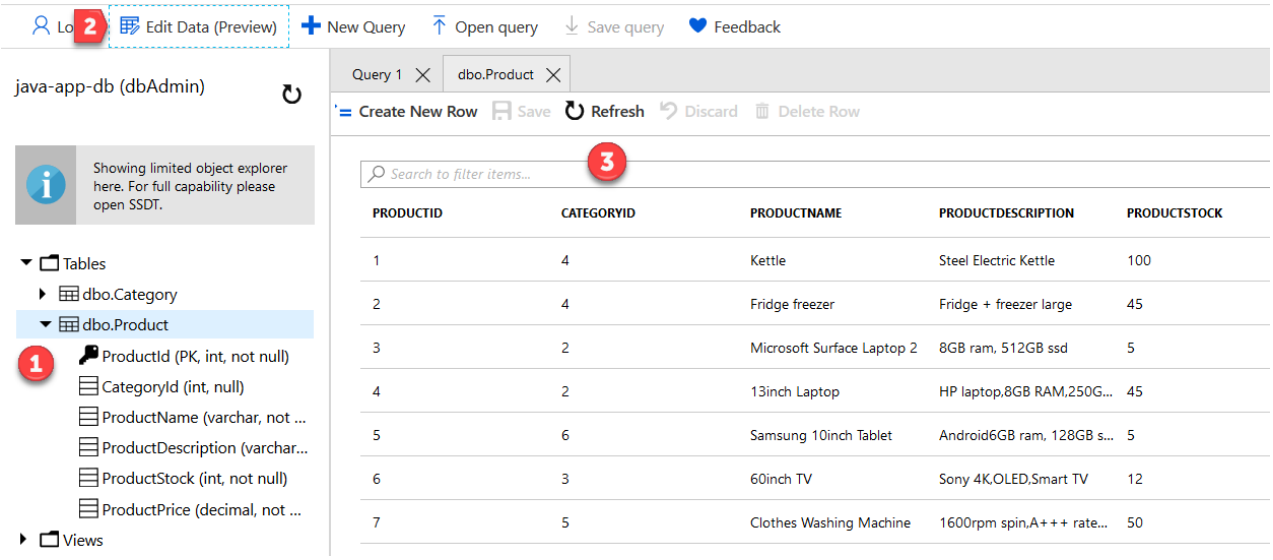
MS SQL Server uses an SQL dialect called Transact-SQL (or T-SQL). See the Bibliography section for links to a tutorial and reference.

1. Paste the SQL in the Query window.
2. Click Run to execute the query.
3. View results.



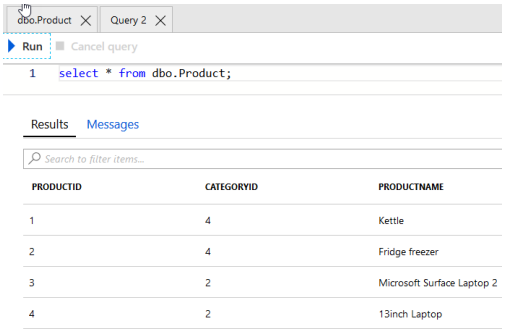


1. If successful, the new tables will appear in the `Tables` folder.
2. To view/ Edit table data, click a table and then the `Edit Data` link.
3. The data will be displayed (and can be edited).



PRODUCTID	CATEGORYID	PRODUCTNAME	PRODUCTDESCRIPTION	PRODUCTSTOCK
1	4	Kettle	Steel Electric Kettle	100
2	4	Fridge freezer	Fridge + freezer large	45
3	2	Microsoft Surface Laptop 2	8GB ram, 512GB ssd	5
4	2	13inch Laptop	HP laptop,8GB RAM,250G...	45
5	6	Samsung 10inch Tablet	Android6GB ram, 128GB s...	5
6	3	60inch TV	Sony 4K,OLED,Smart TV	12
7	5	Clothes Washing Machine	1600rpm spin,A+++ rate...	50

Try a query to select all products.

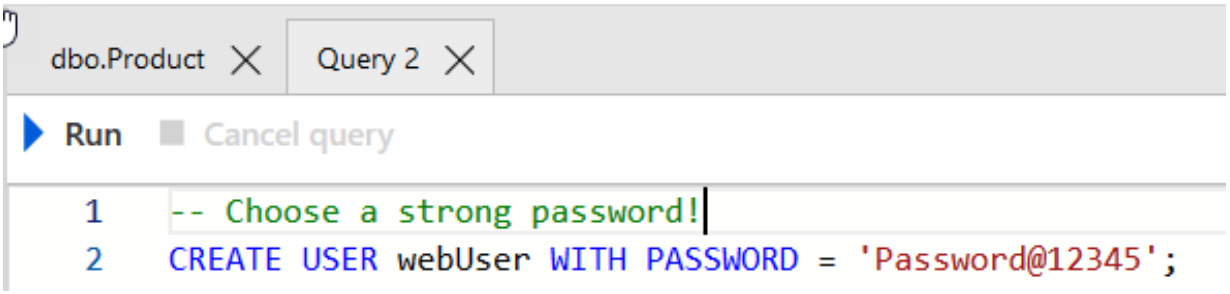


Securing the database

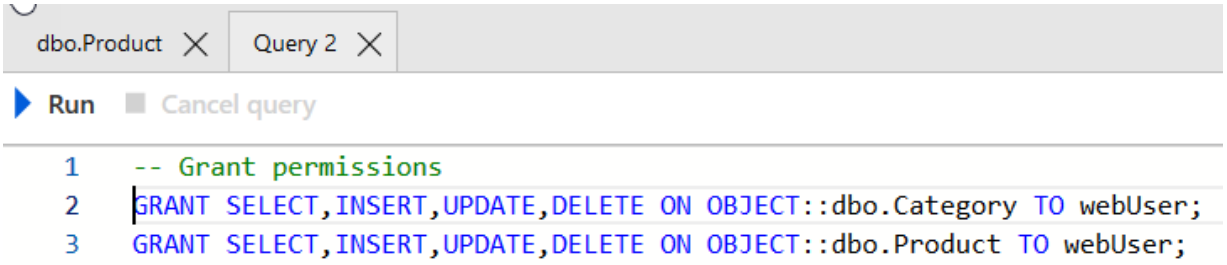
During setup an administrative user account was configured for the database. This account has full control and misuse could lead to accidental or malicious data loss. It is good practice to enforce `Least Privilege`, i.e. only the permissions required to complete a task.

The Java application will use this database will only need `select`, `insert`, `update`, and `delete` permissions on the `Category` and `Product` tables. Using the Query Editor, add a limited access user, webUser, with minimal privileges.

1. Add a user

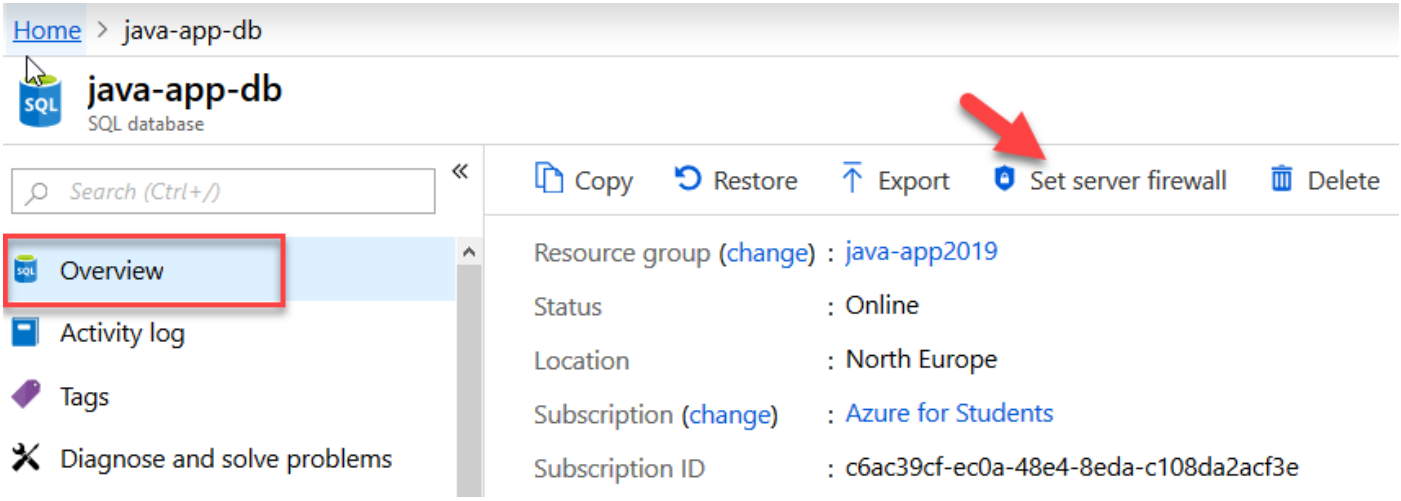


2. Grant permissions to the user

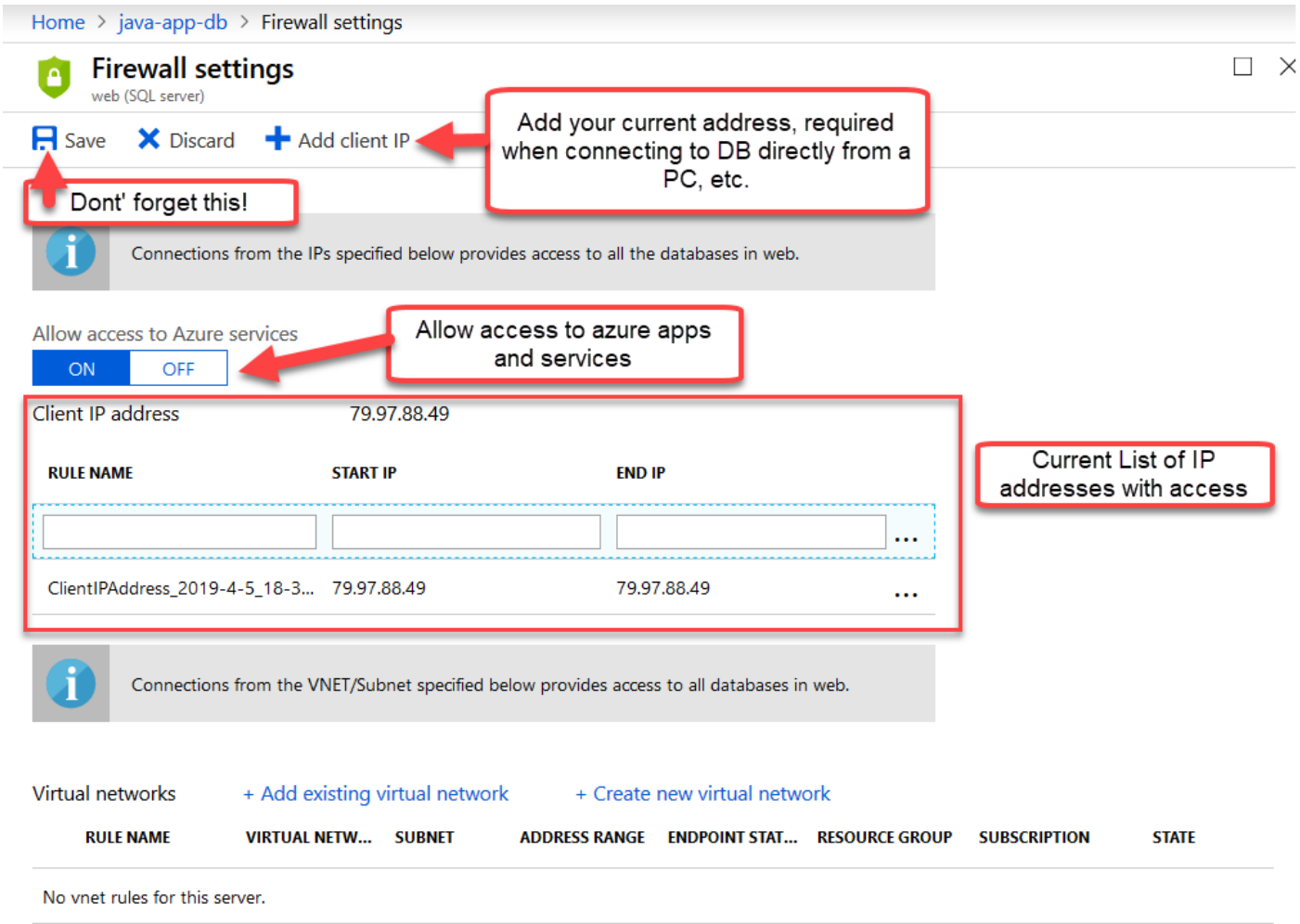


3. Firewall Configuration

The firewall is used to control access to the SQL database based on IP address. To prevent authorised access, only grant access to/ from trusted addresses.



In the database overview section, choose `Set server firewall`. Add your client IP



Bibliography

- Tutorial: Writing Transact-SQL Statements
  - https://docs.microsoft.com/en-us/sql/t-sql/tutorial-writing-transact-sql-statements?view=sql-server-2017
- Learn TSQL Tutorial
  - https://www.tsql.info/
- Database Tools
  - SQL Server Management Studio (SSMS) : https://docs.microsoft.com/en-us/sql/ssms
  - DB Forge (free express version): https://www.devart.com/dbforge/sql/studio/
  - Azure Data Studio (cross platform): https://docs.microsoft.com/en-gb/sql/azure-data-studio
- Database Security
  - https://docs.microsoft.com/en-us/sql/relational-databases/security/contained-database-users-making-your-database-portable?view=sql-server-2017
  - Database permissions - https://docs.microsoft.com/en-us/sql/relational-databases/security/permissions-database-engine?view=sql-server-2017