



Visualise a Relational Database



Ogun Tari Joseph

The screenshot shows the MySQL Workbench interface. In the top-left, the 'Schemas' tree shows the 'QuickSightDatabase'. The central area contains a 'Query Editor' window with the following SQL query:

```
SELECT * FROM newhre;
```

The 'Result Grid' displays the following data:

empno	ename	job	mgr	hiredate	salary	comm	deptno
1	JOHNSON	ADMIN	6	1990-12-17 00:00:00	38000.00	300.00	30
2	MARTIN	MANAGER	9	1998-01-01 00:00:00	45000.00	300.00	30
3	TAFT	SALES I	2	1996-01-01 00:00:00	28000.00	500.00	30
4	HOOPER	SALES I	2	1996-04-01 00:00:00	28000.00	500.00	30
5	BLAKE	MANAGER	5	1998-05-01 00:00:00	54000.00	1200.00	30
6	GARFIELD	MANAGER	9	1993-05-01 00:00:00	54000.00	1200.00	30
7	POUL	TECH	6	1997-09-20 00:00:00	25000.00	0.00	30
8	GLOOM	ENGINEER	10	1997-01-01 00:00:00	32000.00	0.00	30
9	JACKSON	MANAGER	9	1990-01-01 00:00:00	45000.00	300.00	30
10	FILLMORE	MANAGER	9	1994-08-09 00:00:00	60000.00	0.00	30
11	ADAMK	ENGINEER	10	1996-03-15 00:00:00	34000.00	0.00	30
12	WASHN...	ADMIN	6	1998-04-18 00:00:00	38000.00	0.00	30

The bottom pane shows the 'Object Info' tab with a history of database actions:

Action	Time	Message	Duration / Fetch
2	13:32:17	Apply changes to QuickSightDatabase	No changes detected
3	13:32:45	CREATE TABLE newhre(empno INT PRIMARY KEY, ename VARCHAR(10), job VARCHAR(9), manager INT... Error Code: 1046. No database selected Select the default DB to be used by double-clicking its name in the SC...	0.172 sec
4	13:33:03	CREATE TABLE newhre(empno INT PRIMARY KEY, ename VARCHAR(10), job VARCHAR(9), manager INT... (rows) affected	0.250 sec
5	13:33:23	SELECT * FROM newhre LIMIT 0, 1000 0 rows) returned	0.157 sec / 0.000 sec
6	13:33:55	INSERT INTO newhre(empno, ename, job, manager, hiredate, salary, comm, deptname) VALUES (1, JOH..., 14 rows) affected Records: 14 Duplicates: 0 Warnings: 0	0.172 sec
7	13:34:09	SELECT * FROM newhre LIMIT 0, 1000 14 rows) returned	0.156 sec / 0.000 sec



Introducing Today's Project!

What is Amazon RDS?

Amazon RDS is a relational database service that allows you to create and scale databases on the AWS cloud, and it is useful because it makes these processes easier to perform.

How I used Amazon RDS in this project

In today's project, I used Amazon RDS to create a relational database that was connected to MySQL Workbench and Quicksight.

One thing I didn't expect in this project was...

One thing I didn't expect in this project was how time consuming it would be.

This project took me...

This project took me around an hour or two.

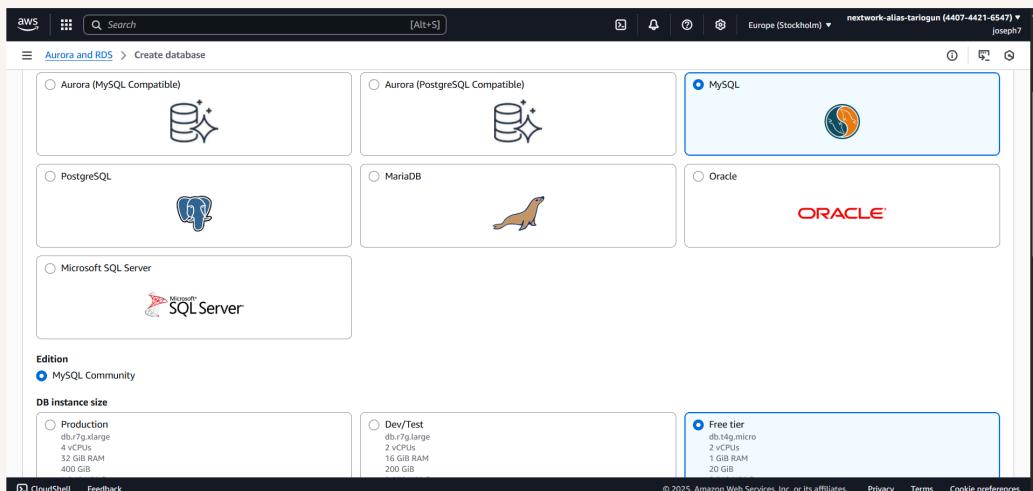
Ogun Tari Joseph
NextWork Student

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In the first part of my project...

Creating a Relational Database

I created my relational database by selecting the engine type and the instance size and by creating a master password and role to prevent external parties from accessing the database.





Understanding Relational Databases

A relational database is a database that consists of columns and rows, with which aspects of the data are able to relate to each other.

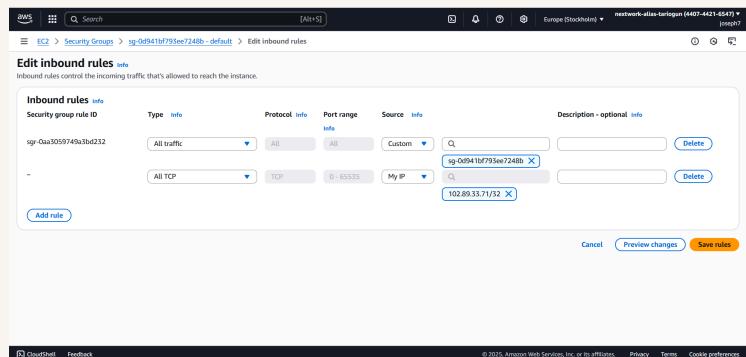
MySQL vs SQL

The difference between MySQL and SQL is that MySQL is an RDBMS (Relational Database Management System) that uses SQL for its processes, while SQL is a query language used to manipulate and manage database.

Populating my RDS instance

The first thing I did was make my RDS instance public because it needs to be able to make a connection with MySQL Workbench for the project to work seamlessly.

I had to update the default security group for my RDS schema because I needed it to be able to connect with MySQL Workbench that I will open from my terminal.



Ogun Tari Joseph
NextWork Student

nextwork.org

Using MySQL Workbench

The screenshot shows the MySQL Workbench interface. The top menu bar includes File, Edit, View, Query, Database, Server, Tools, Scripting, and Help. The left sidebar (Navigator) shows the schema 'QuickSightDatabase' containing tables like 'empno', 'deptno', and 'dept'. The central area displays a SQL query window with the following code:

```
1 • SELECT * FROM newhire;
```

The results grid shows 12 rows of data from the 'newhire' table:

empno	ename	job	mgr	hiredate	salar	comm	deptno
1	ALLEN	ADMIN	6	1990-12-17 00:00:00	1600.00		300
2	HARDING	MANAGER	9	1998-03-02 00:00:00	32000.00		300
3	TAFT	SALES_I	2	1996-01-02 00:00:00	25000.00	500	300
4	HOOVER	SALES_I	2	1996-04-02 00:00:00	27000.00		300
5	LINCOLN	TECH	6	1996-06-23 00:00:00	22500.00	140	300
6	HARVEYFIELD	MANAGER	6	1997-09-22 00:00:00	25000.00		300
7	POLK	TECH	6	1997-09-22 00:00:00	25000.00		300
8	GRANT	ENGINEER	10	1997-03-30 00:00:00	32000.00		300
9	JACKSON	CEO	10	1990-01-01 00:00:00	75000.00		300
10	FILLMORE	MANAGER	9	1994-08-09 00:00:00	36000.00		300
11	ADAMS	ENGINEER	10	1996-03-15 00:00:00	34000.00		300
12	WASHIN...	ADMIN	6	1998-04-16 00:00:00	18000.00		300

The bottom pane shows the 'Action Output' log with the following entries:

Action	Time	Message	Duration / Fetch
2	13:32:17	Apply changes to QuickSightDatabase	No changes detected
3	13:32:45	CREATE TABLE newhire(empno INT PRIMARY KEY, ename VARCHAR(10), job VARCHAR(9), manager INT)	Error Code: 1046. No database selected Select the default DB to be used by double-clicking its name in the SC
4	13:33:03	CREATE TABLE newhire(empno INT PRIMARY KEY, ename VARCHAR(10), job VARCHAR(9), manager INT)	0 rows affected
5	13:33:22	SELECT * FROM newhire LIMIT 0,1000	0 rows returned
6	13:33:55	INSERT INTO newhire(empno, ename, job, manager, hiredate, salary, comm, department) VALUES (1,'JOHN...', 'SALES_I', 2, '1996-01-01 00:00:00', 25000.00, 500, 300)	14 rows affected Records: 14 Duplicates: 0 Warnings: 0
7	13:34:09	SELECT * FROM newhire LIMIT 0,1000	14 rows returned

To populate my database, I ran SQL queries that detailed exactly how I wanted my table to be.



Ogun Tari Joseph
NextWork Student

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Connecting QuickSight and RDS

To connect my RDS instance to QuickSight I added another inbound rule that allows traffic from external sources, which allows QuickSight to connect to my RDS instance.

This solution is risky because all kinds of people can enter the database and damage the data in it, or even steal it for nefarious purposes.

A better strategy

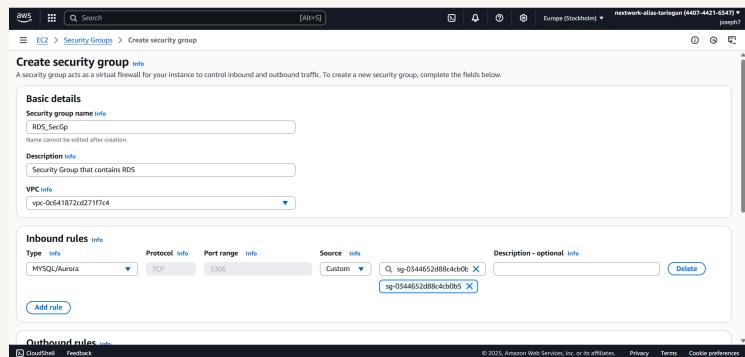
First, I made a new security group so that both RDS and Quicksight are secure under the same VPC.

Next, I connected my new security group to QuickSight by creating a new IAM policy that will allow connecting the security group to Quicksight to take place.

Now to secure my RDS instance

To make my RDS instance secure, I created a new security group for it that allowed inbound traffic from the other security group, which contains Quicksight.

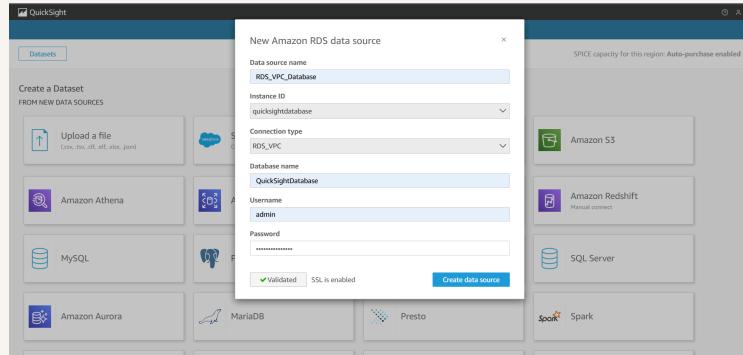
I made sure that my RDS instance could be accessed from QuickSight by making the RDS instance easily accessible through the security group I created for it.



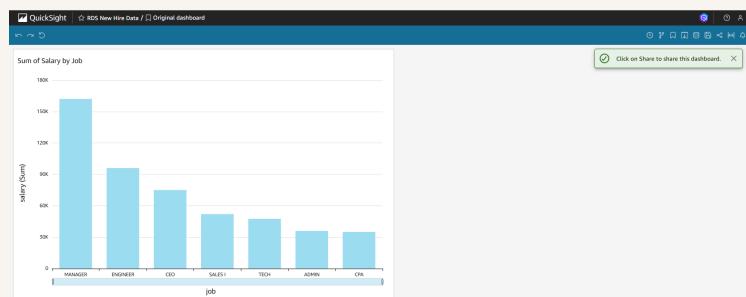
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Adding RDS as a data source for QuickSight



This data source is different from my initial data source because it is now within the same VPC as Quicksight, with both assets having security groups having a connection to each other.





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