Aim -

To study and implement Database as a Service on SQL/ NoSQL databases like AWS RDS, Azure SQL, MongoDB or Firebase.

Theory -

What is Database as a Service(DBaaS)?

Database as a Service (DBaaS) is a cloud-based service model that provides users with access to a managed database system, eliminating the need for users to set up, configure, and maintain their own database infrastructure. In a DBaaS model, the cloud service provider handles tasks such as provisioning, scaling, backup, security, and maintenance of the database, allowing users to focus on their applications and data management tasks.

Advantages of DBaaS:

- Reduced Management Overhead: DBaaS eliminates the need for users to manage the underlying infrastructure, including hardware provisioning, software installation, patching, and maintenance, which reduces administrative overhead and allows organizations to focus on their core business activities.

- Scalability: DBaaS platforms typically offer scalability features that allow users to easily scale their database resources up or down based on demand. This elasticity enables organizations to accommodate fluctuating workloads and scale their database resources cost-effectively.

- High Availability and Fault Tolerance: Many DBaaS providers offer built-in high availability and fault tolerance features, such as automated failover, data replication, and backups, to ensure continuous availability and data protection.

- Cost Efficiency: DBaaS often follows a pay-as-you-go pricing model, where users only pay for the resources they consume. This can result in cost savings compared to traditional on-premises database deployments, as users are not required to invest in upfront hardware and infrastructure costs.

- Faster Time to Market: DBaaS platforms streamline the database provisioning process, allowing users to quickly deploy and configure databases without the need for lengthy setup and configuration tasks. This accelerates the development and deployment of applications, reducing time to market.

Disadvantages of DBaaS:

- Limited Control: With DBaaS, users relinquish some level of control over the database infrastructure to the service provider. This lack of control may be a concern for organizations with specific security, compliance, or customization requirements.

- Data Security and Privacy Risks: Storing sensitive data in a third-party cloud environment raises concerns about data security and privacy. Organizations must carefully evaluate the security measures implemented by DBaaS providers to ensure compliance with regulatory requirements and protect their data from unauthorized access and breaches.

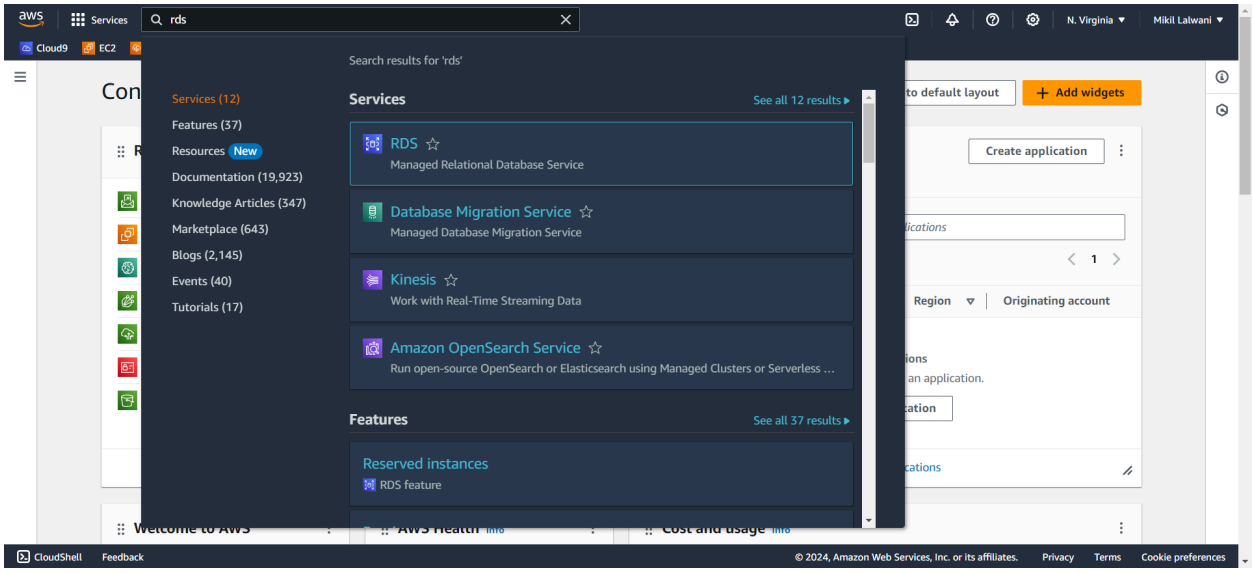
- Vendor Lock-In: Migrating data between different DBaaS providers or transitioning from DBaaS to an on-premises deployment may be challenging and costly, leading to vendor lock-in. Organizations should consider the long-term implications of vendor lock-in and evaluate strategies to mitigate this risk.

- Performance and Latency: Performance and latency issues may arise in DBaaS environments, particularly in multi-tenant deployments where resources are shared among multiple users. Organizations should assess the performance characteristics of DBaaS offerings and ensure they meet their performance requirements before migration.

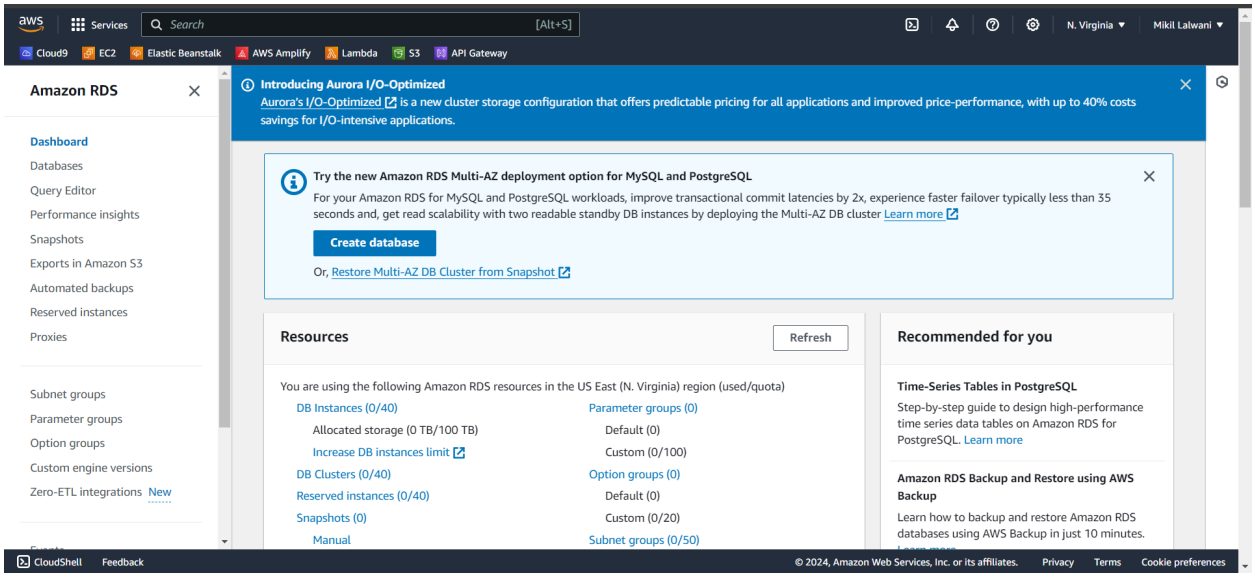
- Dependency on Internet Connectivity: DBaaS relies on internet connectivity for accessing and managing database resources, which may pose challenges in environments with limited or unreliable internet connectivity. Organizations should consider the potential impact of internet outages or disruptions on their database operations and implement contingency plans accordingly.

Procedure -

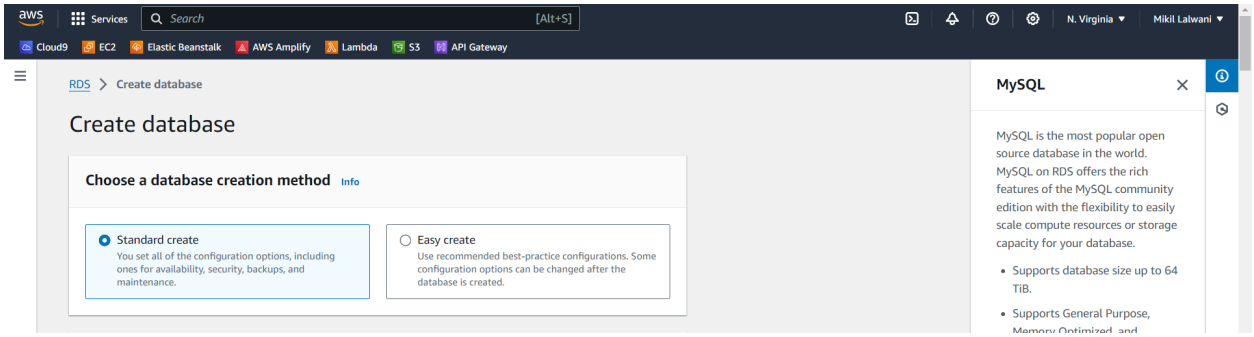
Step1 : Login to aws console and search RDS.



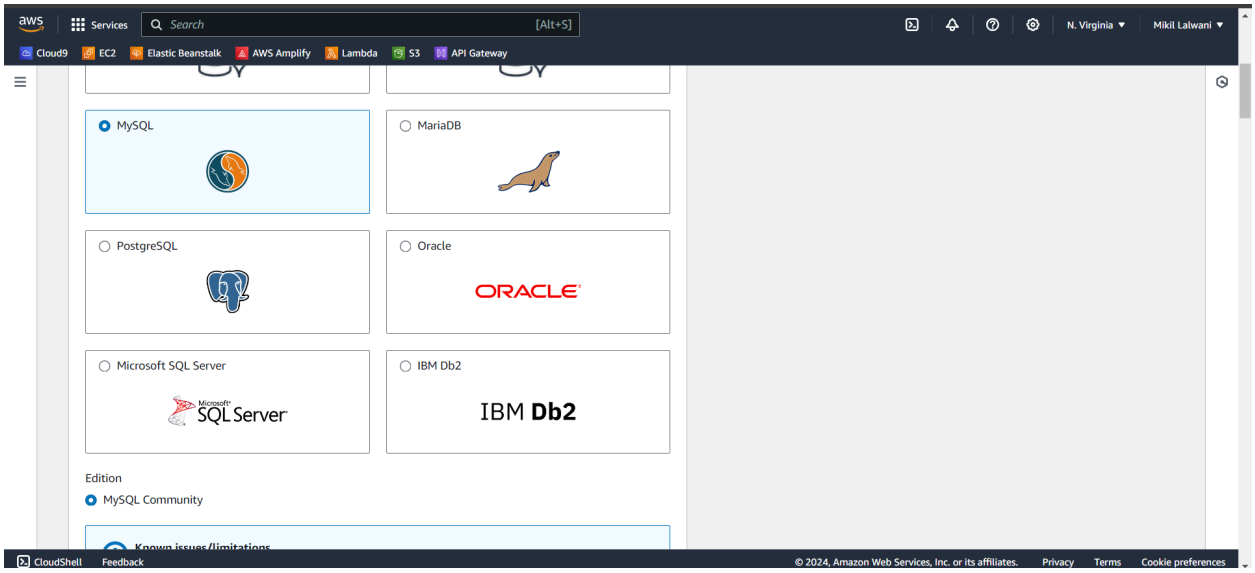
Step2: Click on to RDS and create database



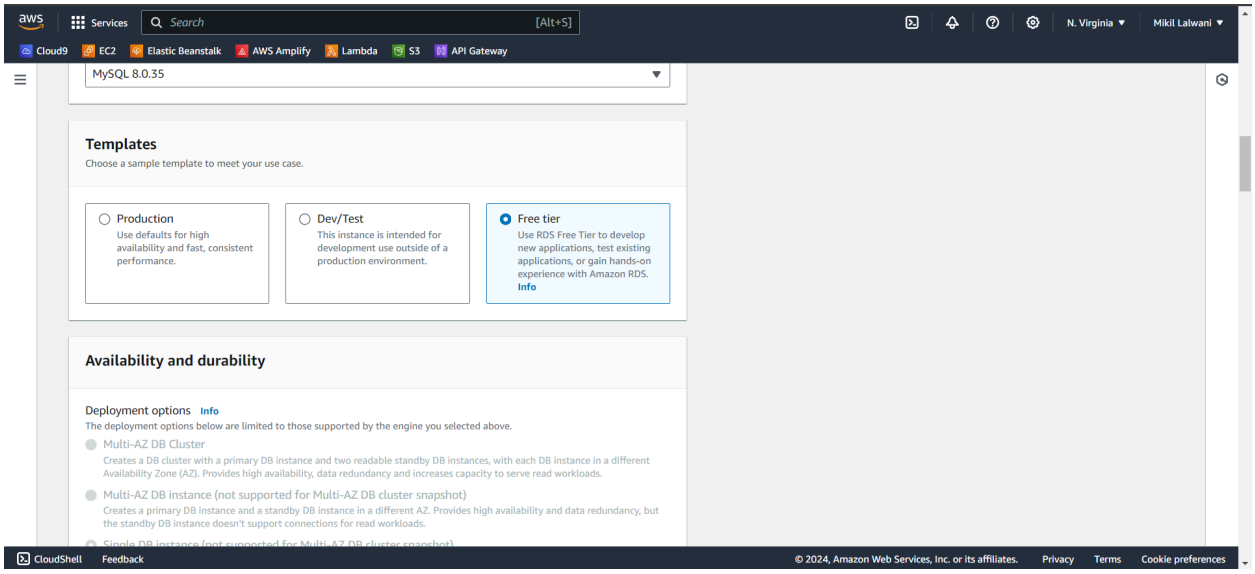
Step 3: Select standard database



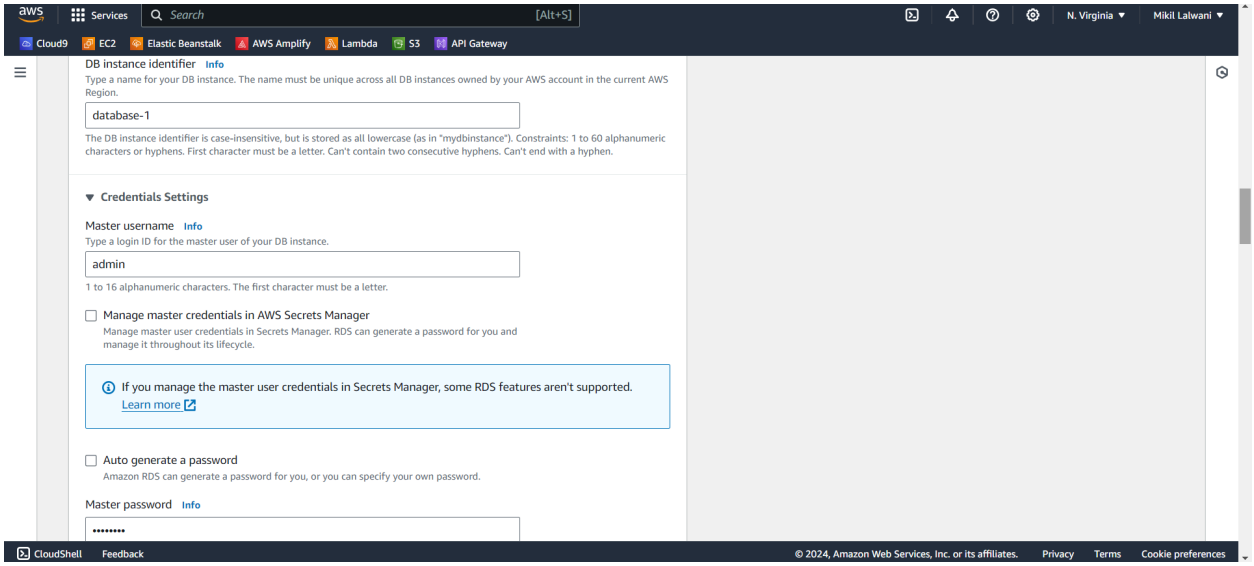
Step 4: Select MySQL and MySQL Community edition



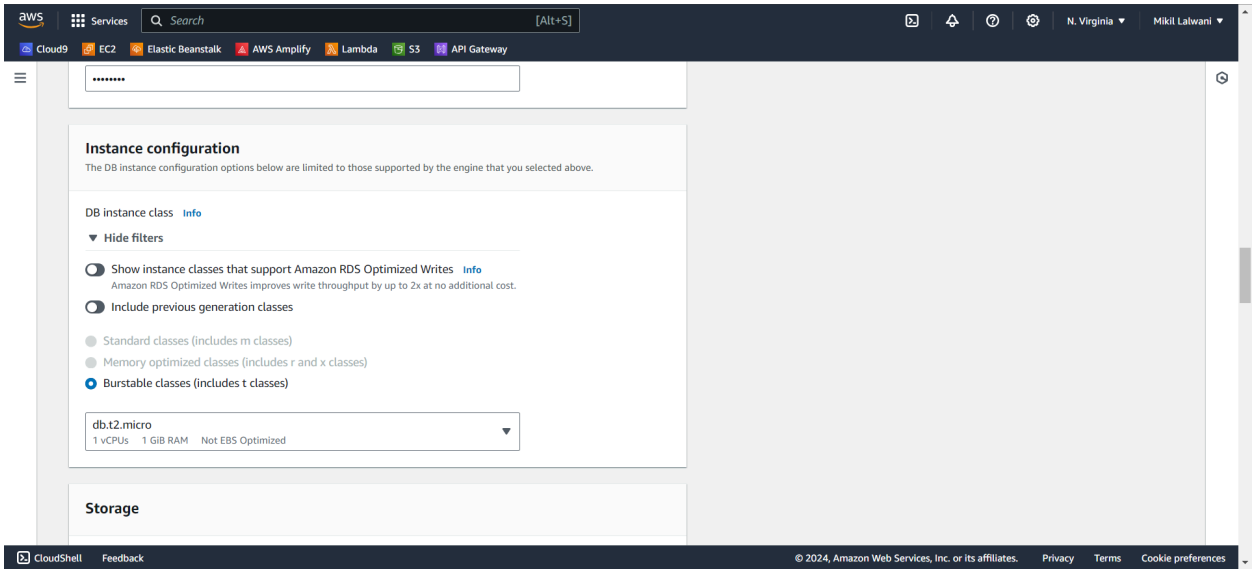
Step 5:In Templates select Free tier.

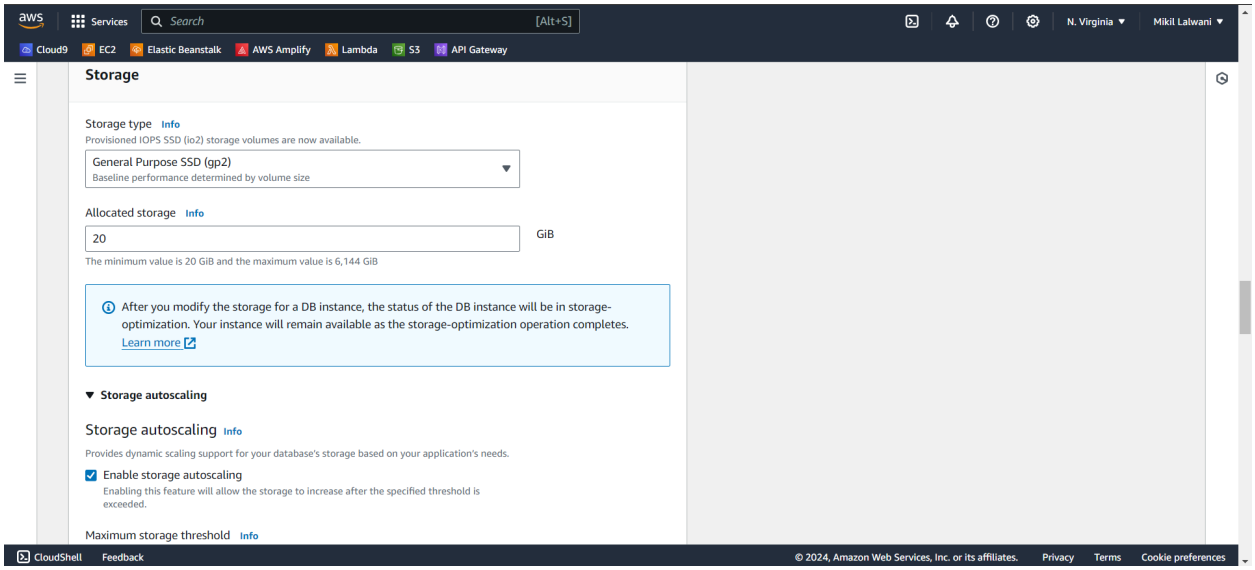


Step 6: Mention database name (default is database1) and username and password

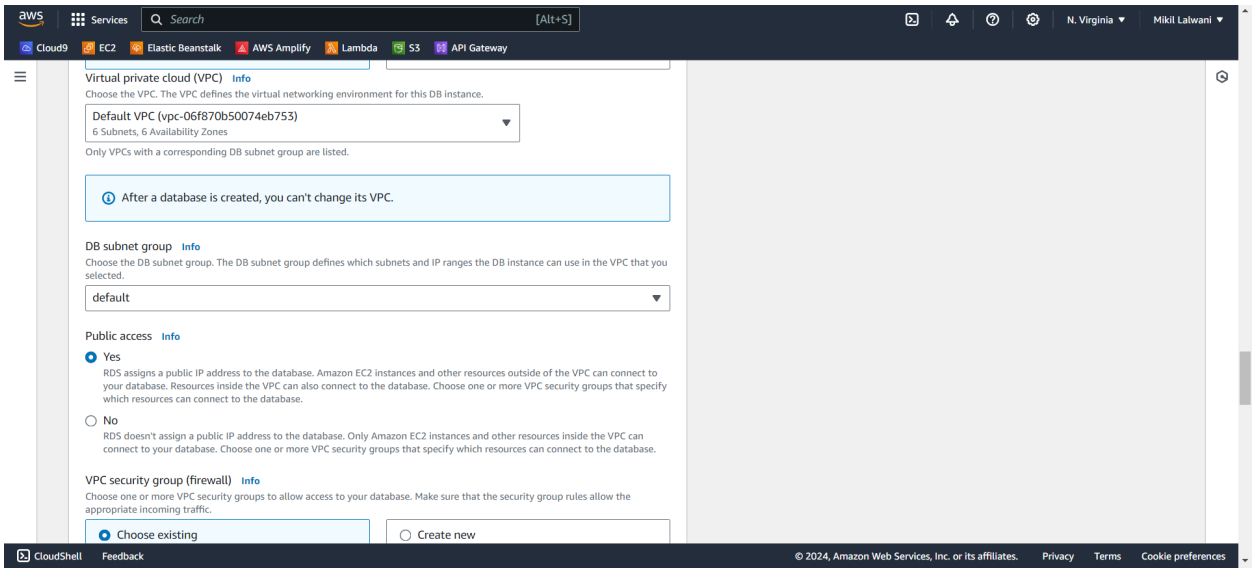


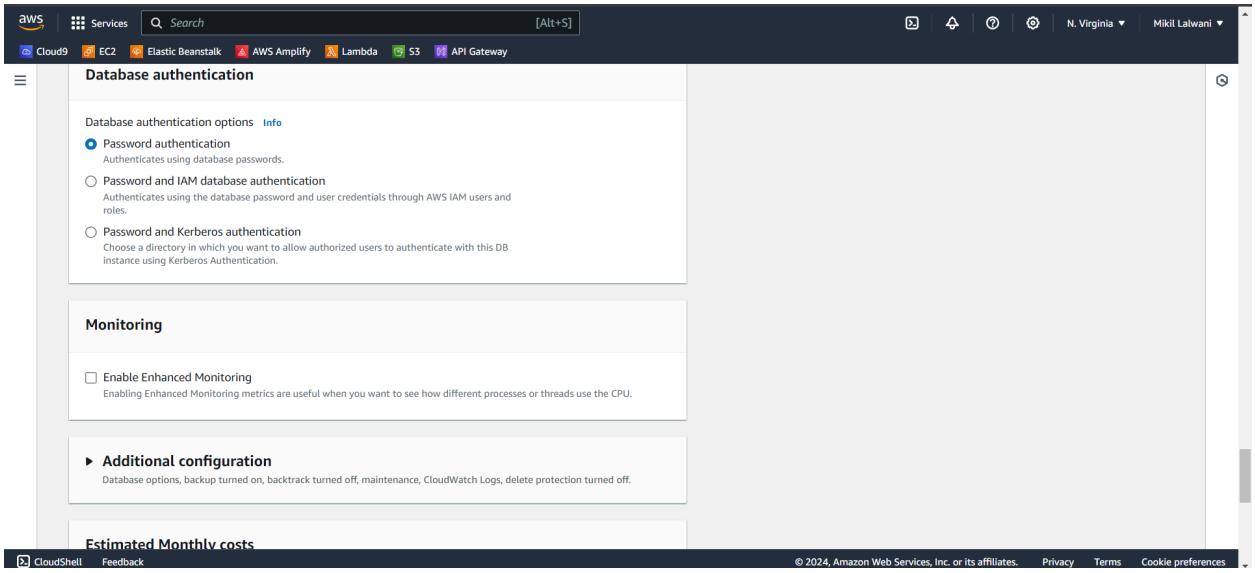
Step 7: Instance is t2.micro



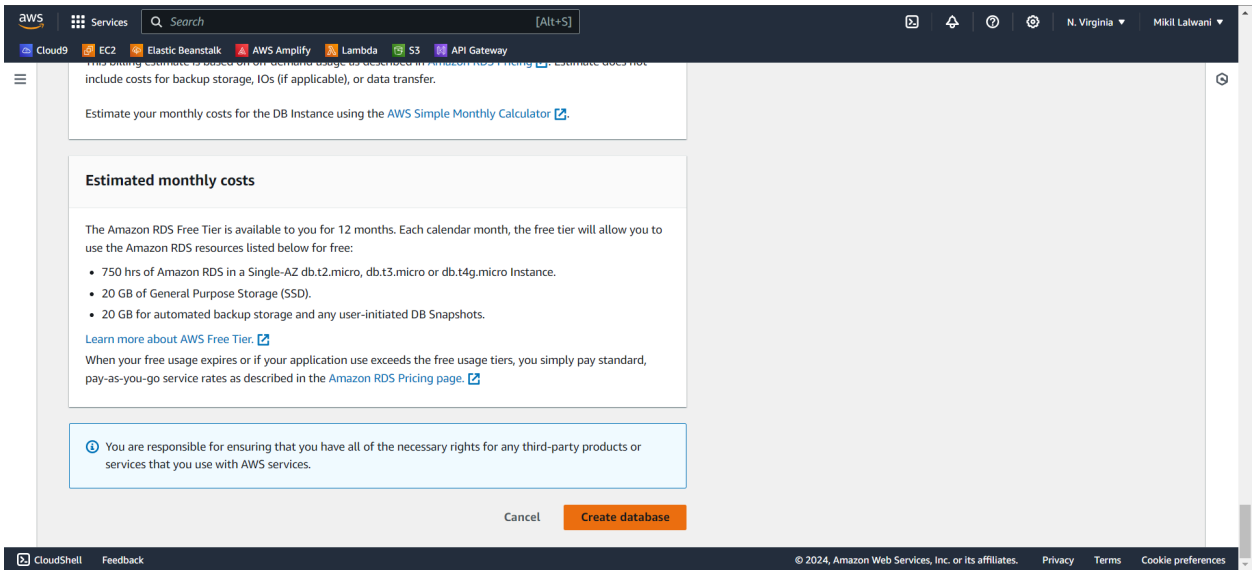


Step 8: Select Public Access -Yes





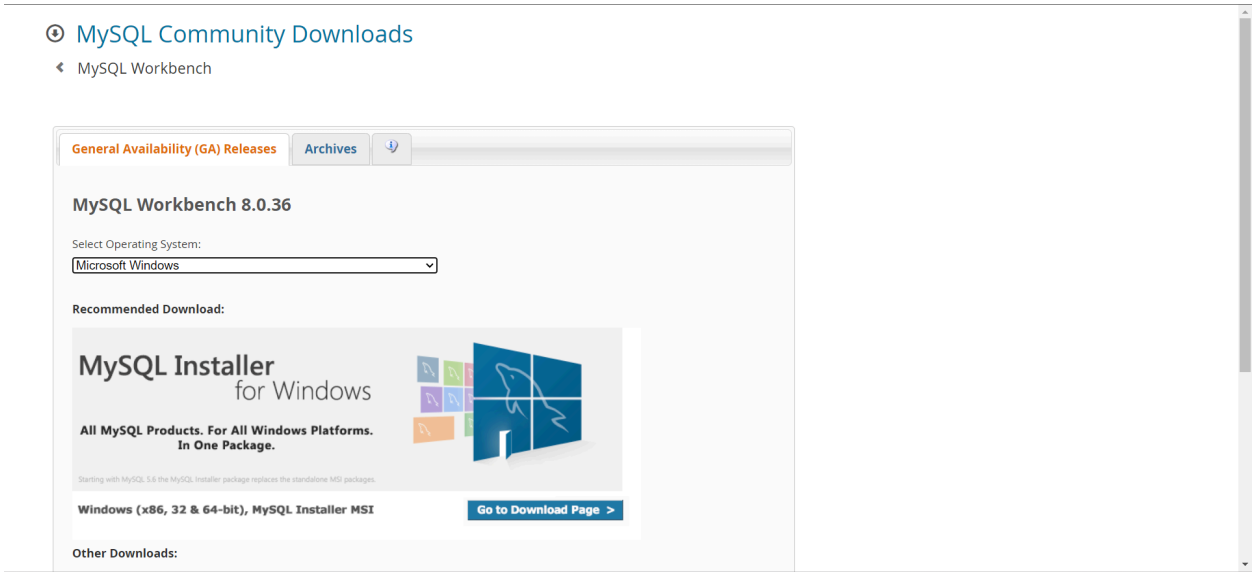
Step 9: Click on to create Database



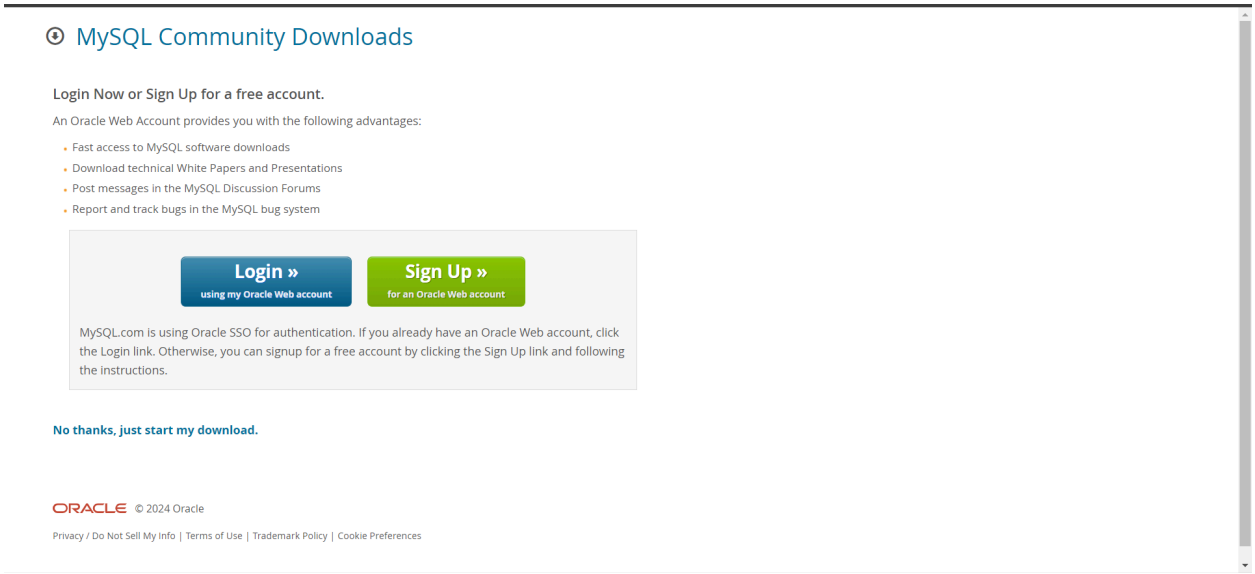
Step 10: It will take some time

Step 11: Go to google type mysql workbench

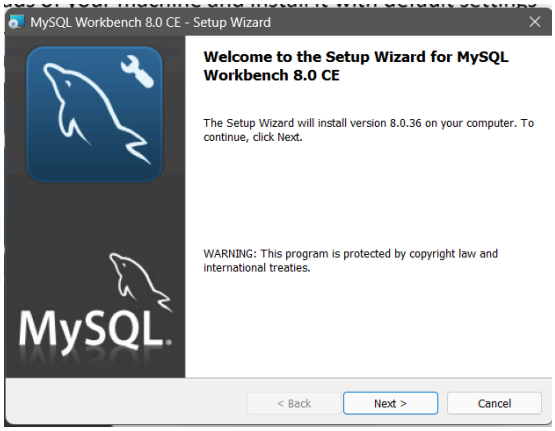
Step 12: Click on to download. MySQL community download – Microsoft Windows

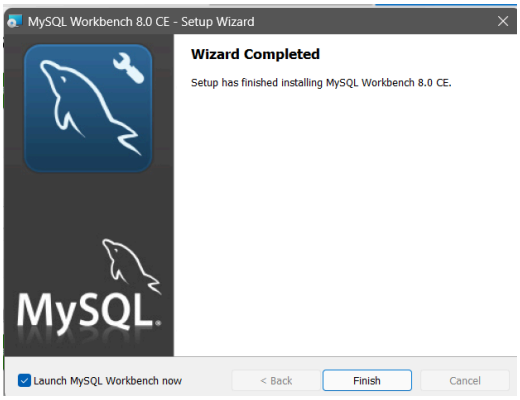


Step 13: Click on to – No thanks , just download

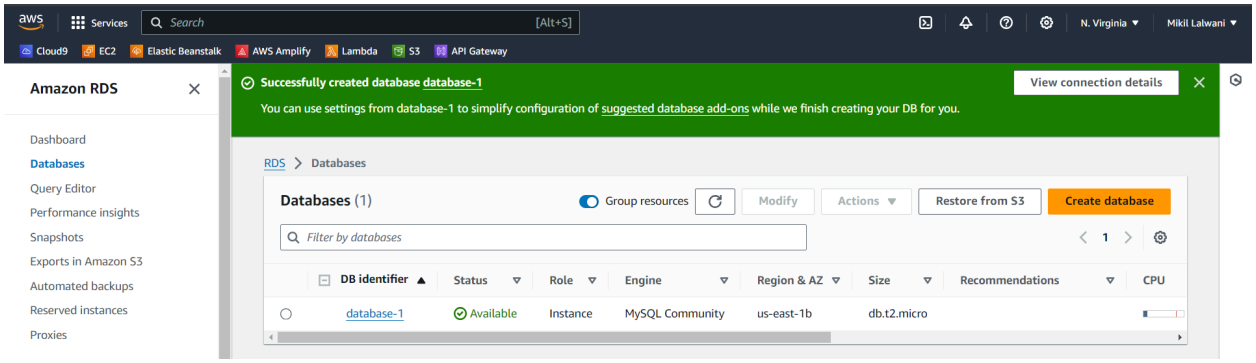


Step 14: Go to downloads of your machine and install it with default settings

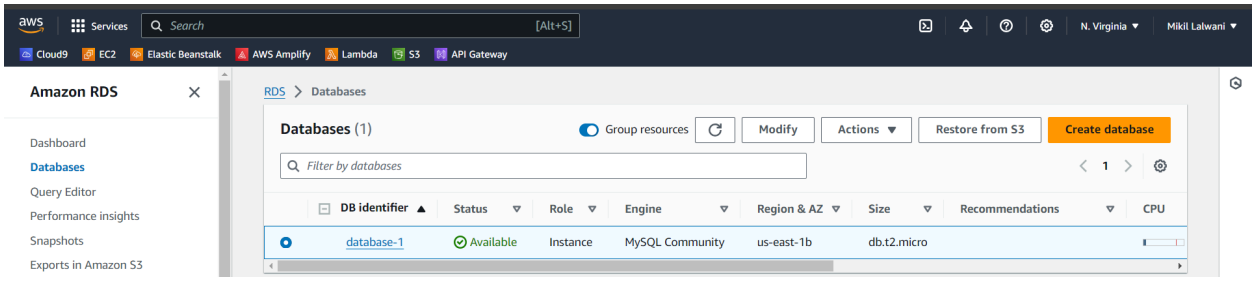




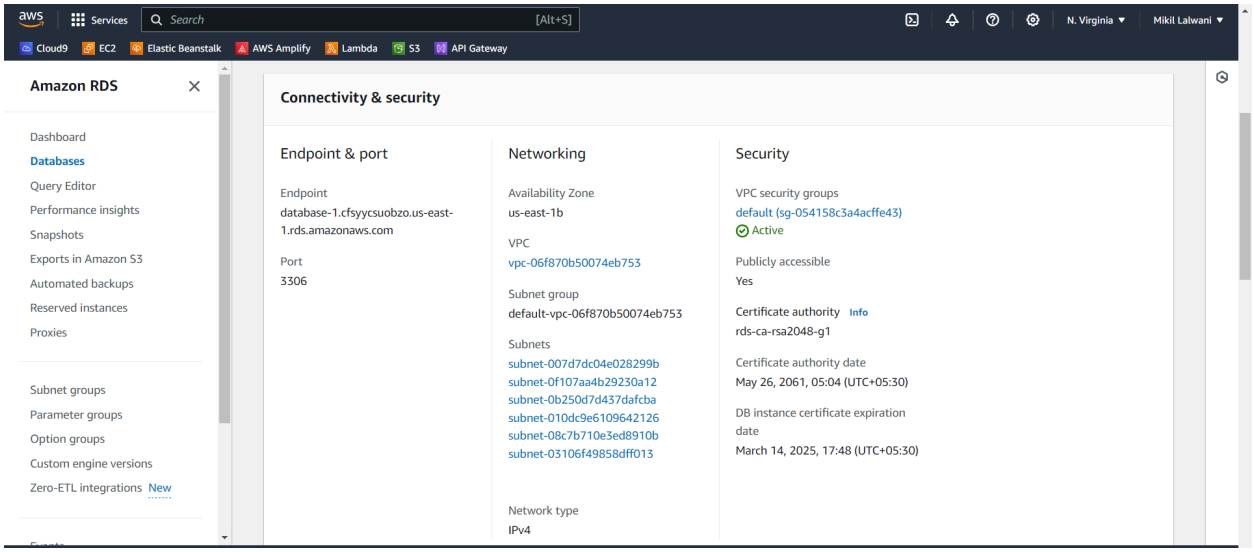
Check your database is created and status is available



Step 16: Click on to database



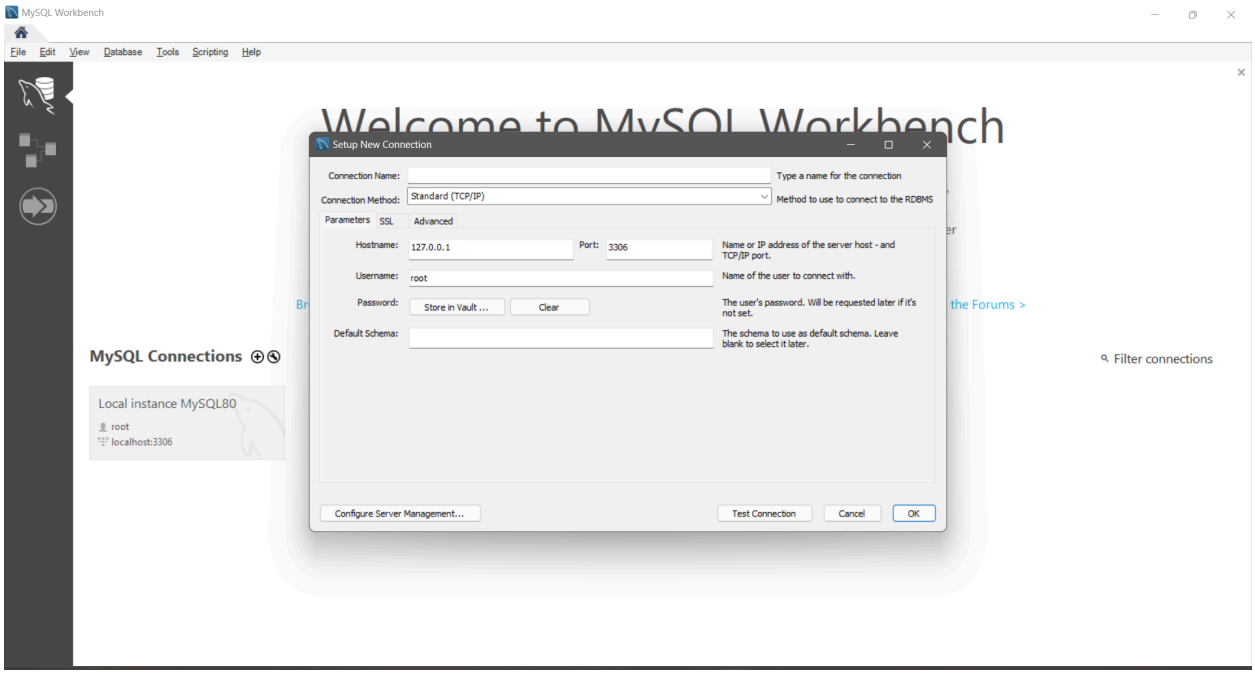
Step 17: Copy Endpoint



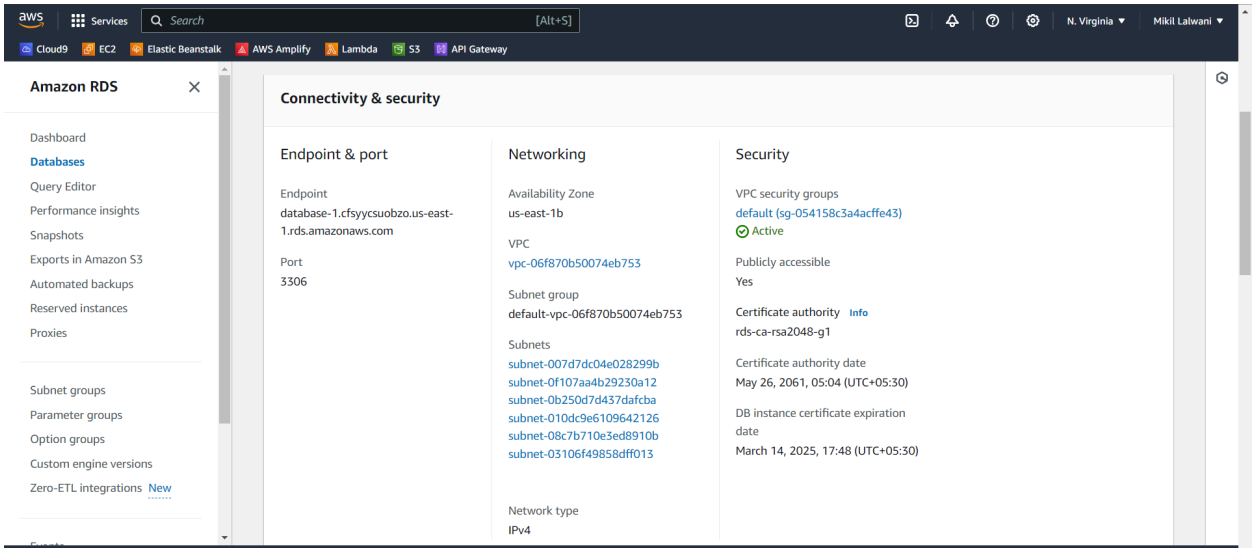
Step 18: Go back to workbench

Step 19: Click on to mysql connection

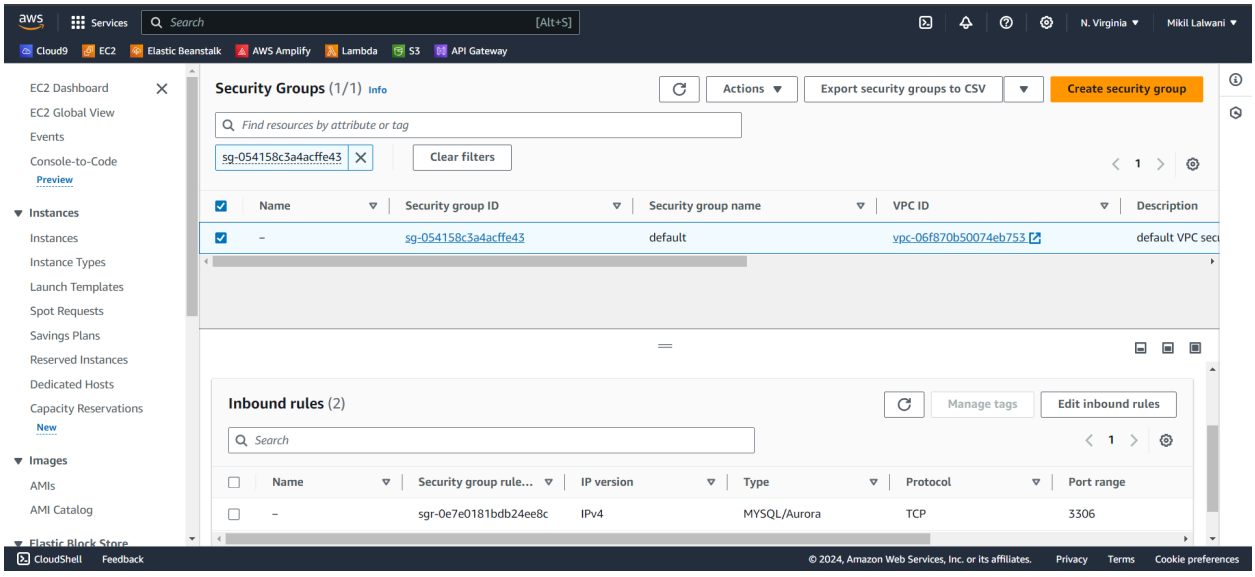
Step 20: Paste copied endpoint in Hostname
Connection Name : database-1
Username : admin
Click on to Test Connection



Step 21: Go to vpc security group

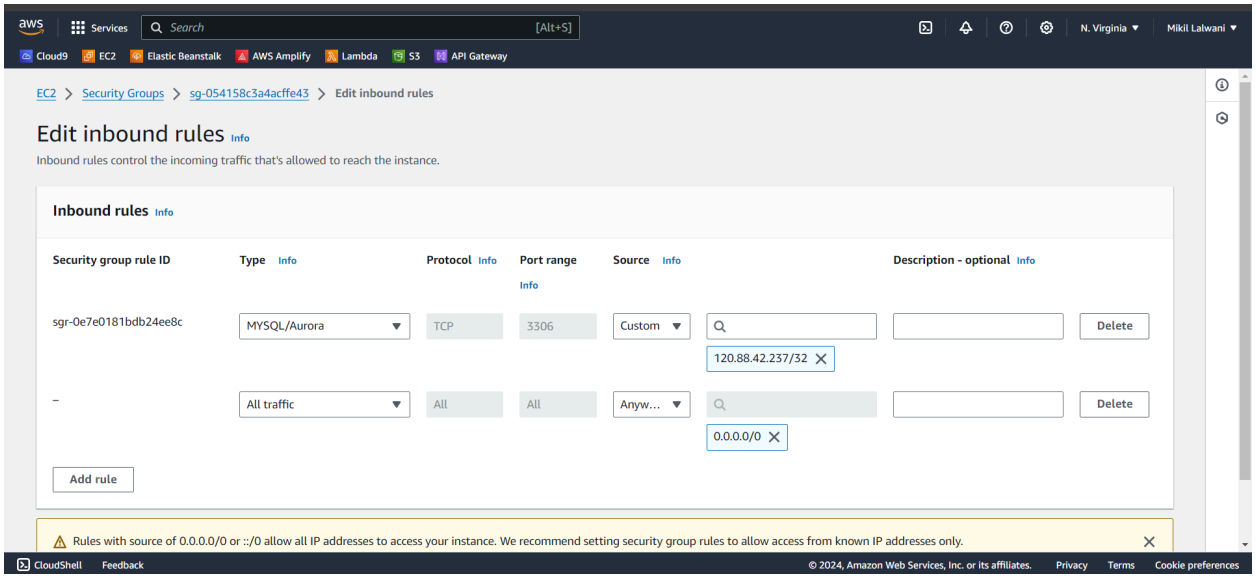


Step 22: Click on to inbound rules

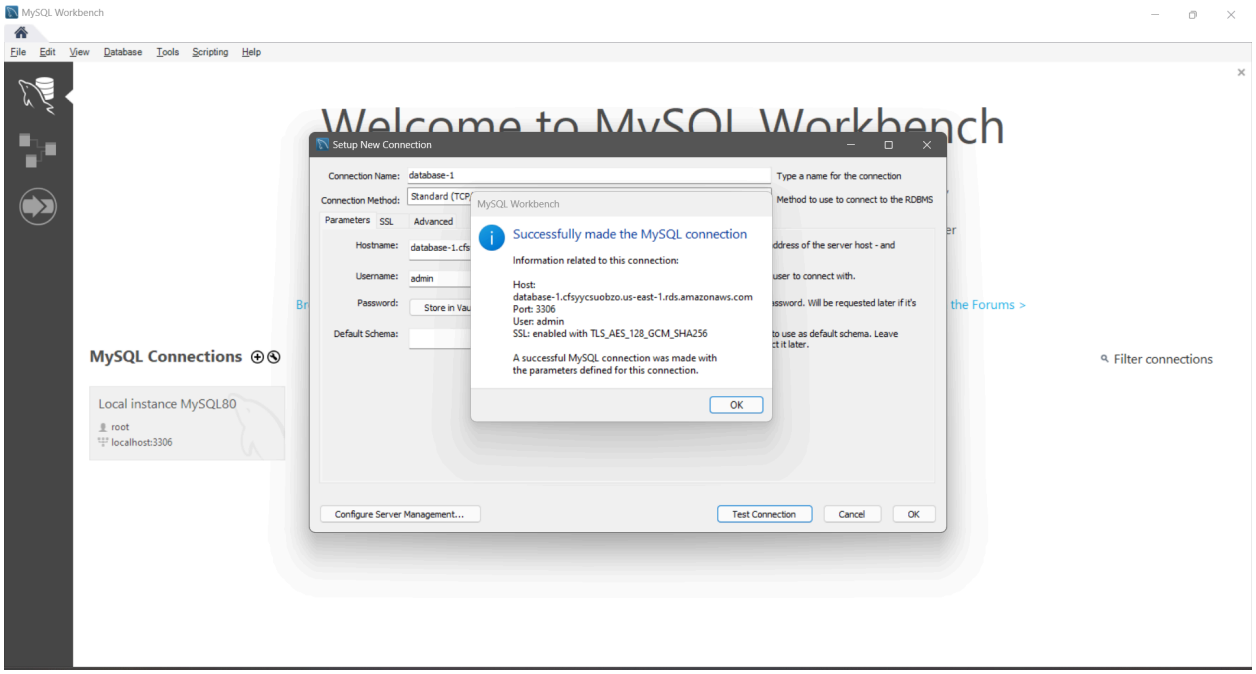


Step 23: First select Click on to Edit inbound rule add rule select ipv4 --all traffic (add 0.0.0.0./0) and save Rules

(important step to add inbound rule)

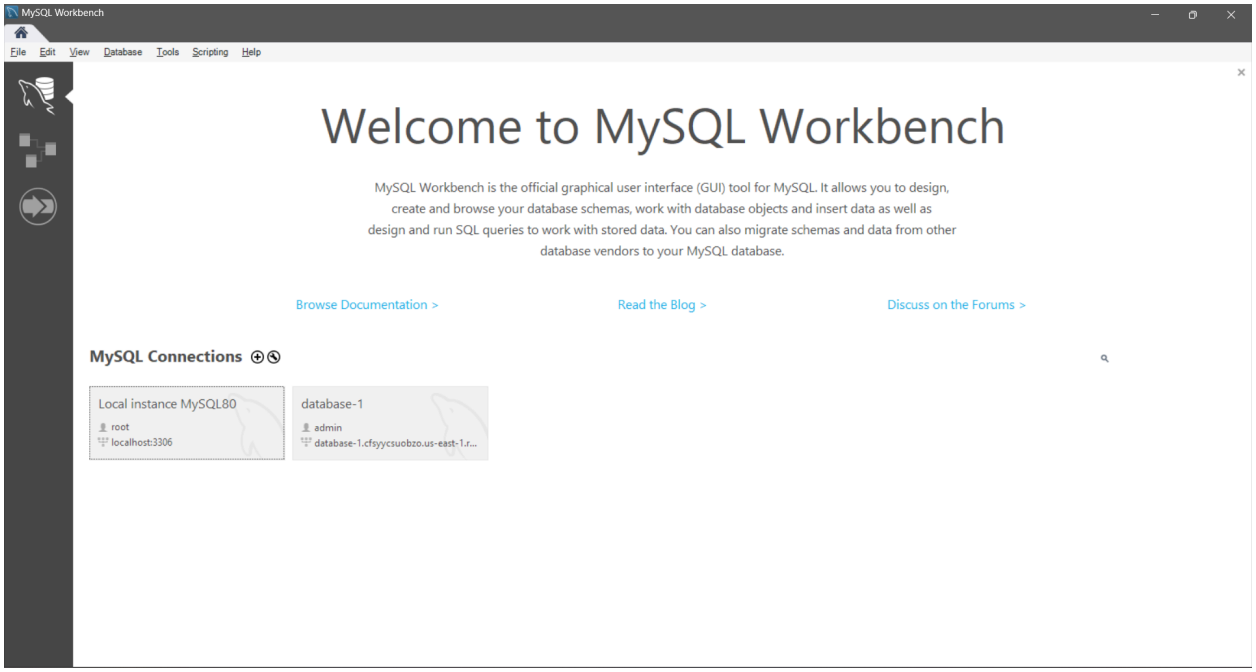


Step 24: Goto workbench (after giving details click on to Test Connection)



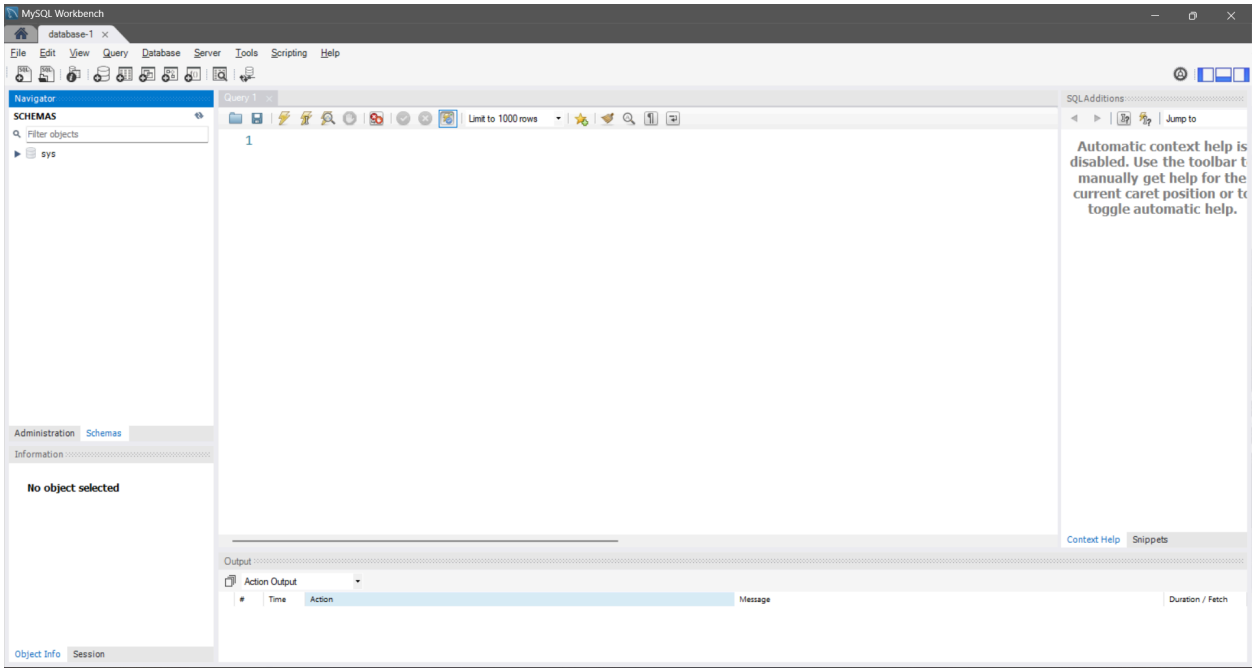
Click on Ok button

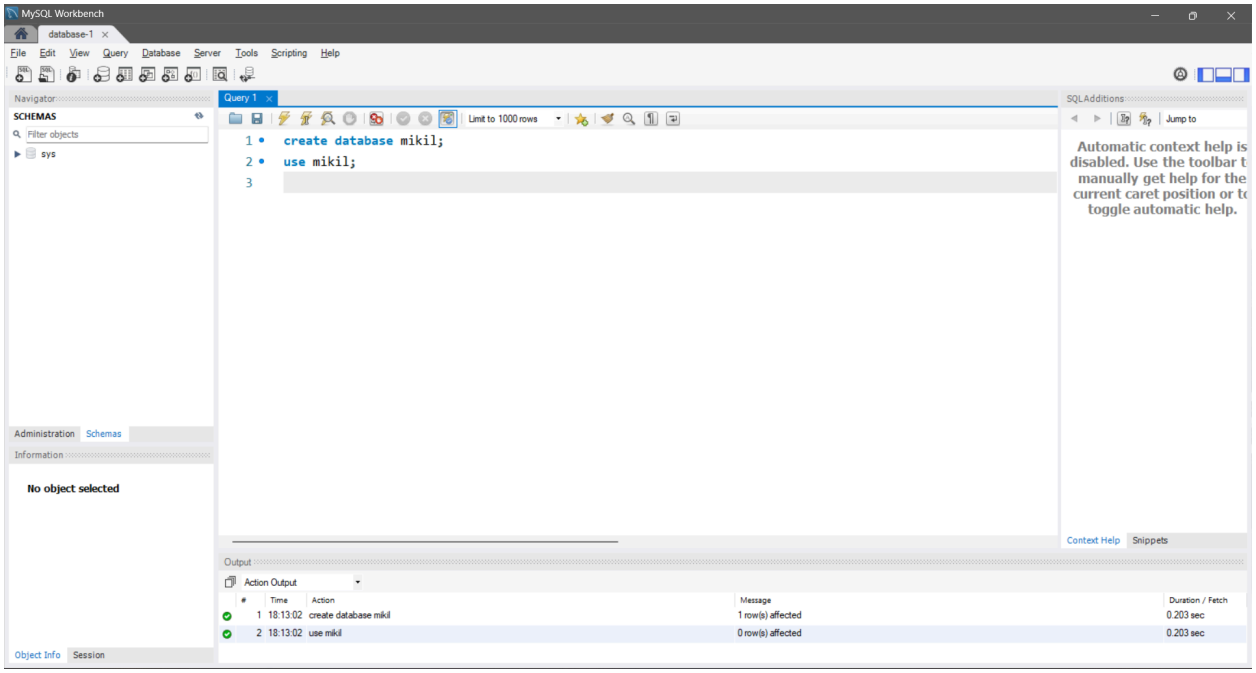
Go to workbench double click on connection(database-1)

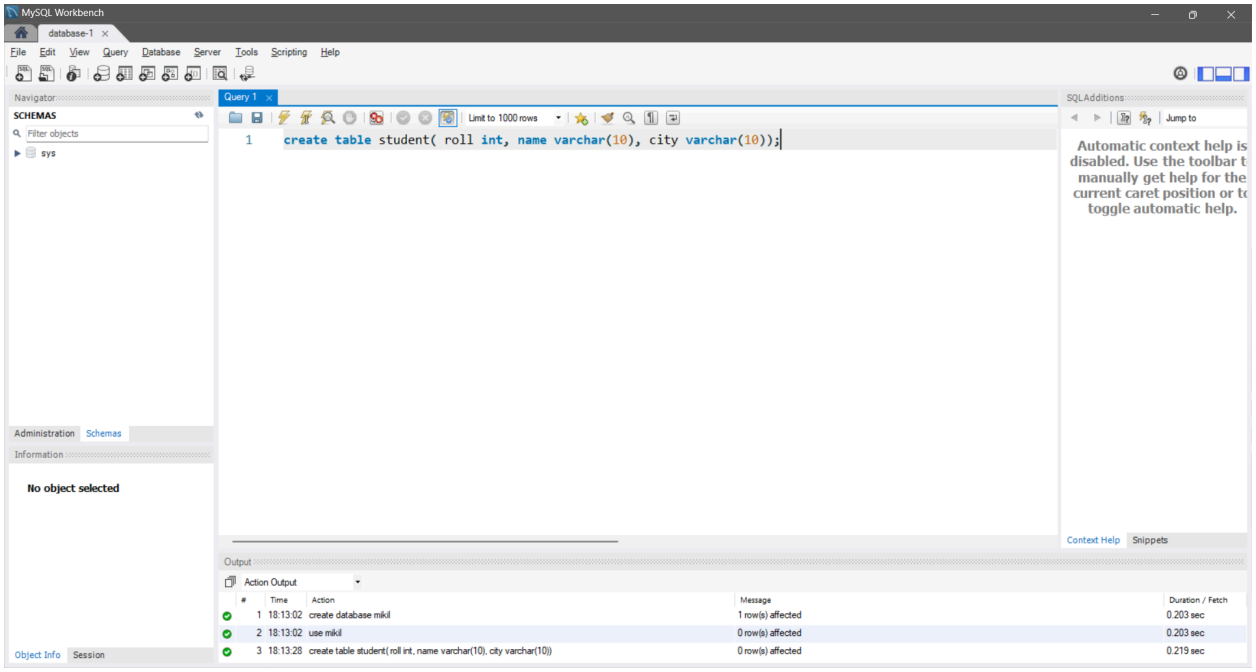


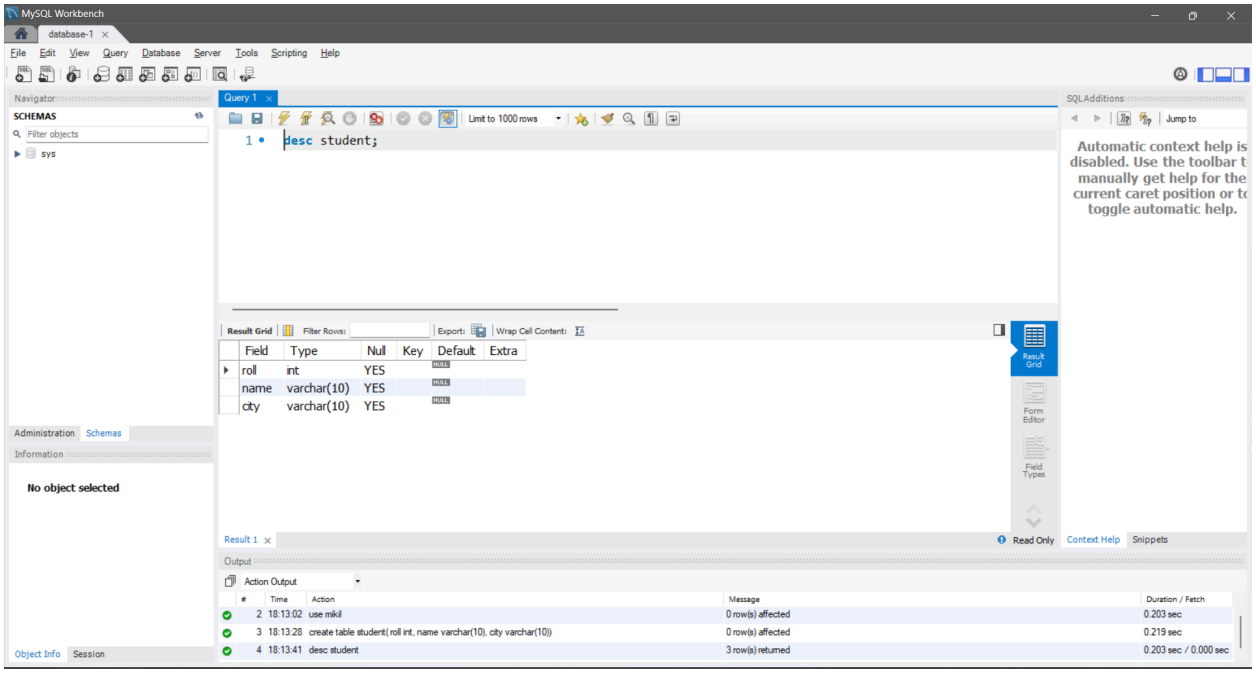
Step 25: Write query and execute

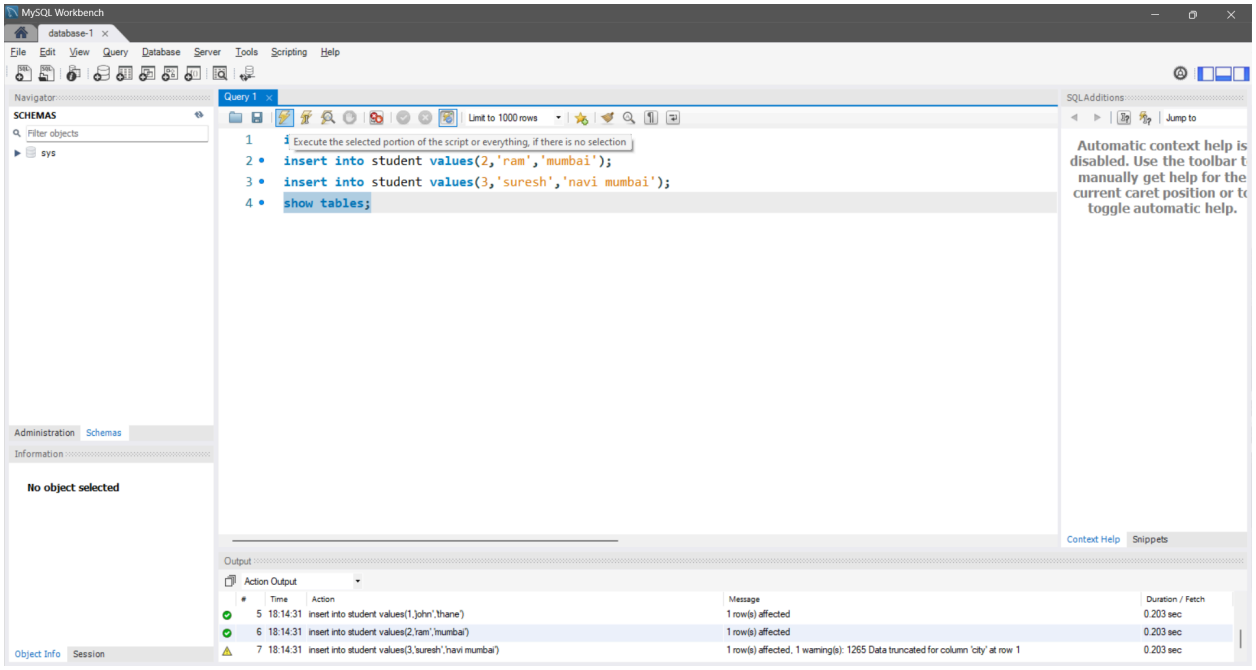
Create a database, and perform CRUD operations.

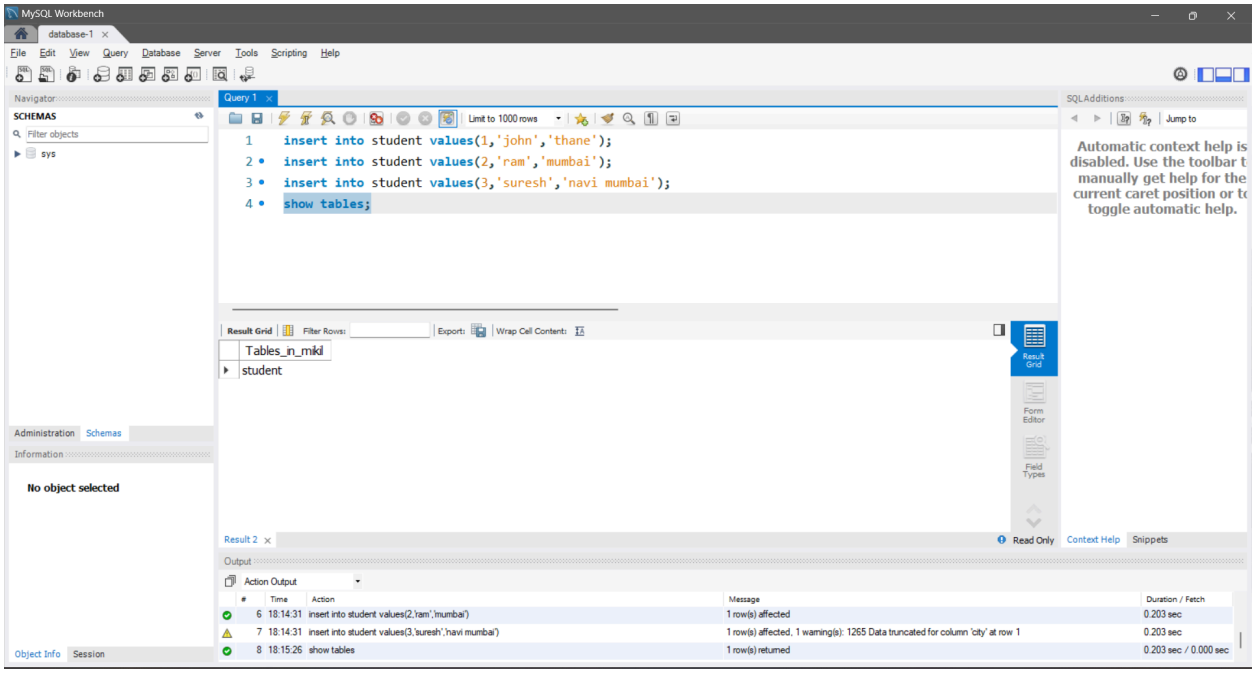

MySQL Workbench
database-1
File Edit View Query Database Server Tools Scripting Help
Navigator
SCHEMAS
Filter objects
sys
Query 1
Limit to 1000 rows
1
SQLAdditions
Jump to
Automatic context help is disabled. Use the toolbar t manually get help for the current caret position or t toggle automatic help.
Administration Schemas
Information
No object selected
Object Info Session
Context Help Snippets
Output
Action Output
Time Action Message Duration / Fetch

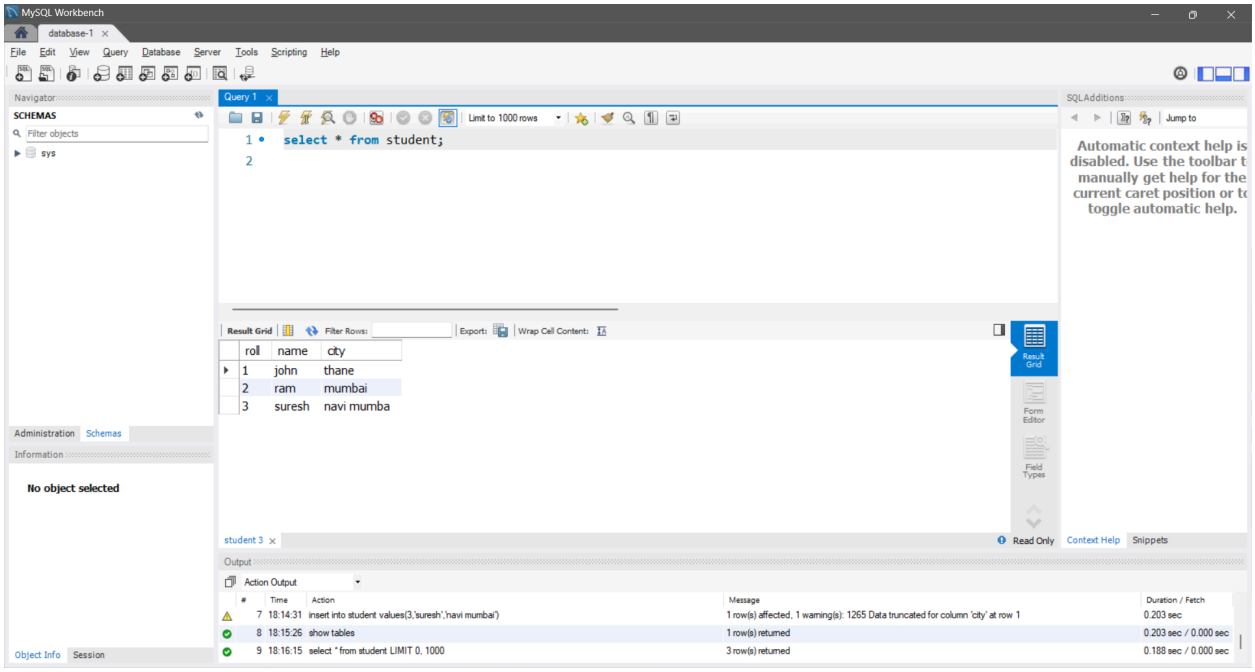

MySQL Workbench
database-1
File Edit View Query Database Server Tools Scripting Help
Navigator
SCHEMAS
Filter objects
sys
Query 1
Limit to 1000 rows
1 • create database mikil;
2 • use mikil;
3
SQLAdditions
Jump to
Automatic context help is disabled. Use the toolbar t manually get help for the current caret position or t toggle automatic help.
Administration Schemas
Information
No object selected
Object Info Session
Context Help Snippets
Output
Action Output
Time Action Message Duration / Fetch
1 18:13:02 create database mikil 1 row(s) affected 0.203 sec
2 18:13:02 use mikil 0 row(s) affected 0.203 sec

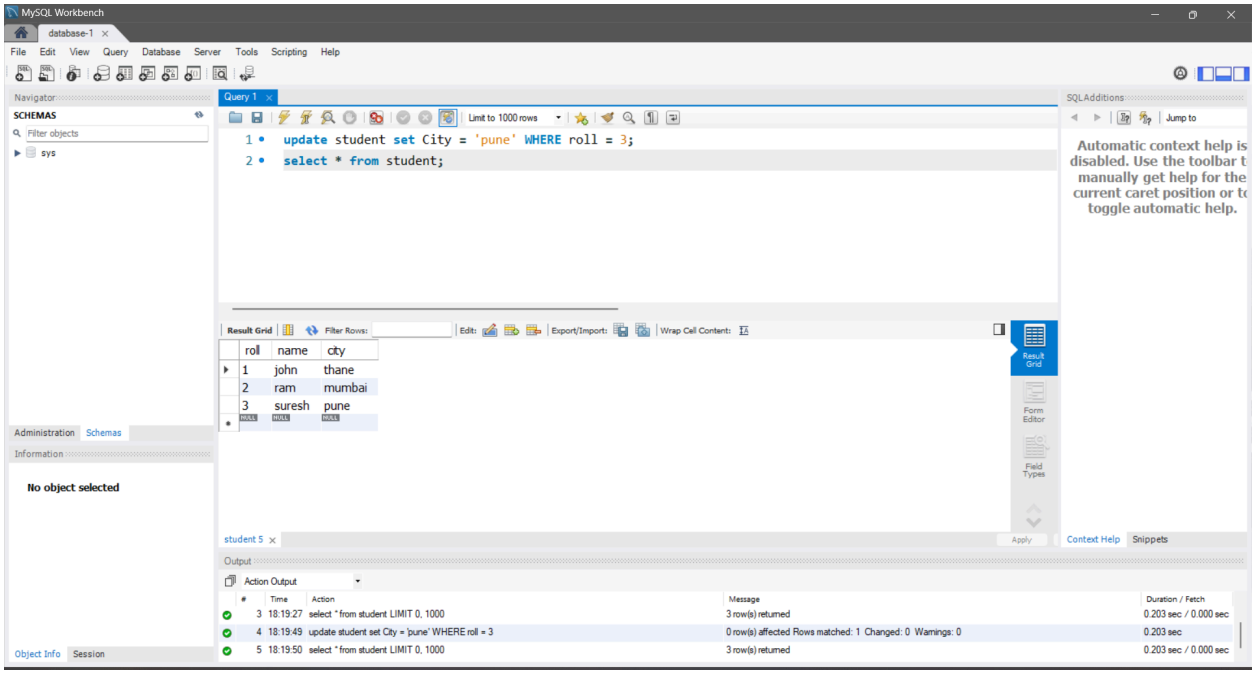

MySQL Workbench
database-1
File Edit View Query Database Server Tools Scripting Help
Navigator
SCHEMAS
Filter objects
sys
Administration Schemas
Information
No object selected
Object Info Session
Query 1
Limit to 1000 rows
1 create table student(roll int, name varchar(10), city varchar(10));
SQL Additions
Jump to
Automatic context help is disabled. Use the toolbar t manually get help for the current caret position or t toggle automatic help.
Context Help Snippets
Output
Action Output
Time Action Message Duration / Fetch
1 18:13:02 create database mikil 1 row(s) affected 0.203 sec
2 18:13:02 use mikil 0 row(s) affected 0.203 sec
3 18:13:28 create table student(roll int, name varchar(10), city varchar(10)) 0 row(s) affected 0.219 sec

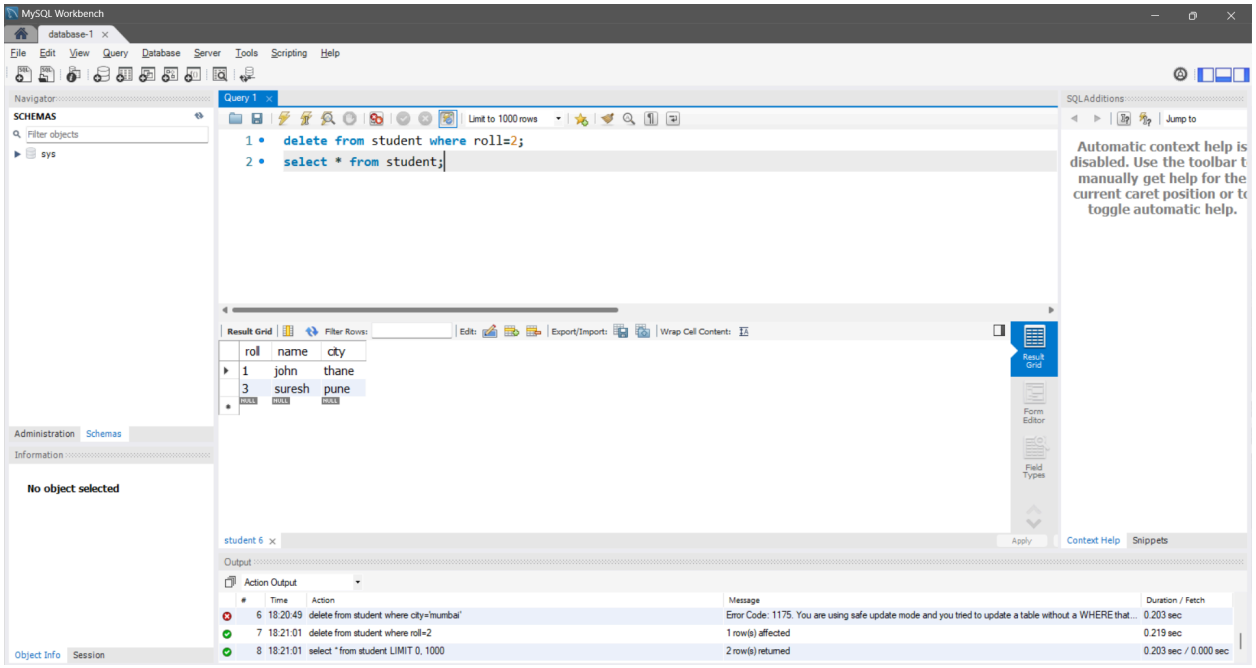

MySQL Workbench
database-1
File Edit View Query Database Server Tools Scripting Help
Navigator
SCHEMAS
Filter objects
sys
Administration Schemas
Information
No object selected
Object Info Session
Query 1
Limit to 1000 rows
1 desc student;
SQL Additions
Jump to
Automatic context help is disabled. Use the toolbar t manually get help for the current caret position or t toggle automatic help.
Result Grid Filter Rows: Export: Wrap Cell Content:
Field Type Null Key Default Extra
roll int YES NULL
name varchar(10) YES NULL
city varchar(10) YES NULL
Result Grid
Form Editor
Field Types
Result 1
Read Only
Context Help Snippets
Output
Action Output
Time Action Message Duration / Fetch
2 18:13:02 use mikil 0 row(s) affected 0.203 sec
3 18:13:28 create table student(roll int, name varchar(10), city varchar(10)) 0 row(s) affected 0.219 sec
4 18:13:41 desc student 3 row(s) returned 0.203 sec / 0.000 sec


MySQL Workbench
database-1
File Edit View Query Database Server Tools Scripting Help
Navigator
SCHEMAS
Filter objects
sys
Query 1
Limit to 1000 rows
Execute the selected portion of the script or everything, if there is no selection
1 i
2 • insert into student values(2,'ram','mumbai');
3 • insert into student values(3,'suresh','navi mumbai');
4 • show tables;
SQLAdditions
Jump to
Automatic context help is disabled. Use the toolbar t manually get help for the current caret position or t toggle automatic help.
Administration Schemas
Information
No object selected
Object Info Session
Context Help Snippets
Output
Action Output
Time Action Message Duration / Fetch
5 18:14:31 insert into student values(1,'john','thane') 1 row(s) affected 0.203 sec
6 18:14:31 insert into student values(2,'ram','mumbai') 1 row(s) affected 0.203 sec
7 18:14:31 insert into student values(3,'suresh','navi mumbai') 1 row(s) affected, 1 warning(s): 1265 Data truncated for column 'city' at row 1 0.203 sec

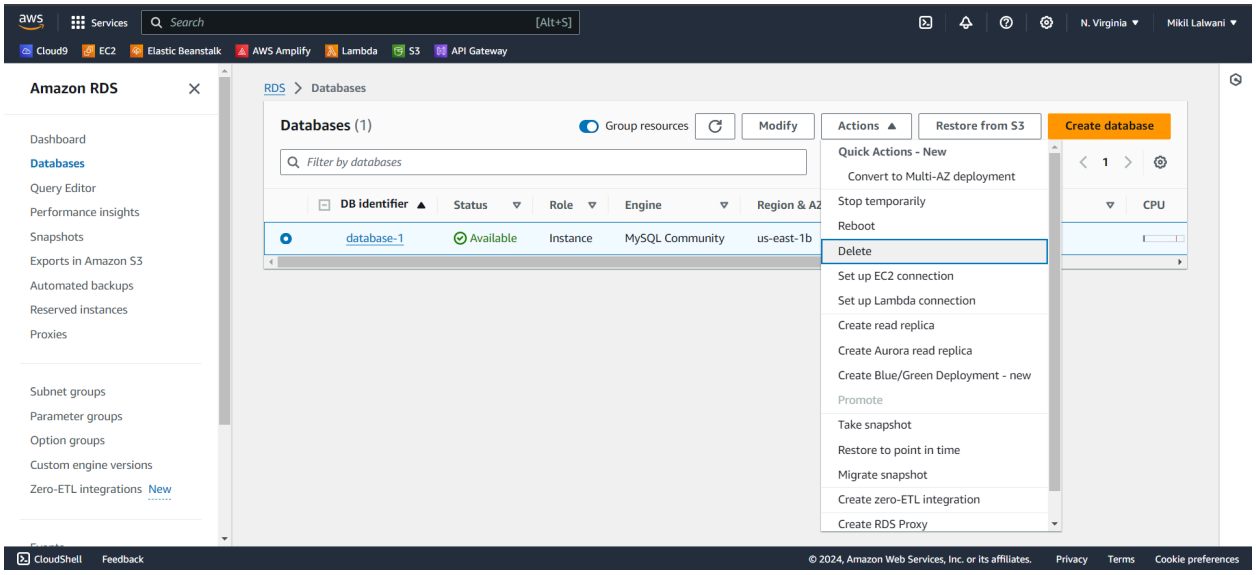

MySQL Workbench
database-1
File Edit View Query Database Server Tools Scripting Help
Navigator
SCHEMAS
Filter objects
sys
Query 1
Limit to 1000 rows
1 insert into student values(1,'john','thane');
2 • insert into student values(2,'ram','mumbai');
3 • insert into student values(3,'suresh','navi mumbai');
4 • show tables;
SQLAdditions
Jump to
Automatic context help is disabled. Use the toolbar t manually get help for the current caret position or t toggle automatic help.
Result Grid Filter Rows: Export: Wrap Cell Content:
Tables_in_mkl
student
Result Grid
Form Editor
Field Types
Result 2
Read Only
Context Help Snippets
Administration Schemas
Information
No object selected
Object Info Session
Output
Action Output
Time Action Message Duration / Fetch
6 18:14:31 insert into student values(2,'ram','mumbai') 1 row(s) affected 0.203 sec
7 18:14:31 insert into student values(3,'suresh','navi mumbai') 1 row(s) affected, 1 warning(s): 1265 Data truncated for column 'city' at row 1 0.203 sec
8 18:15:26 show tables 1 row(s) returned 0.203 sec / 0.000 sec

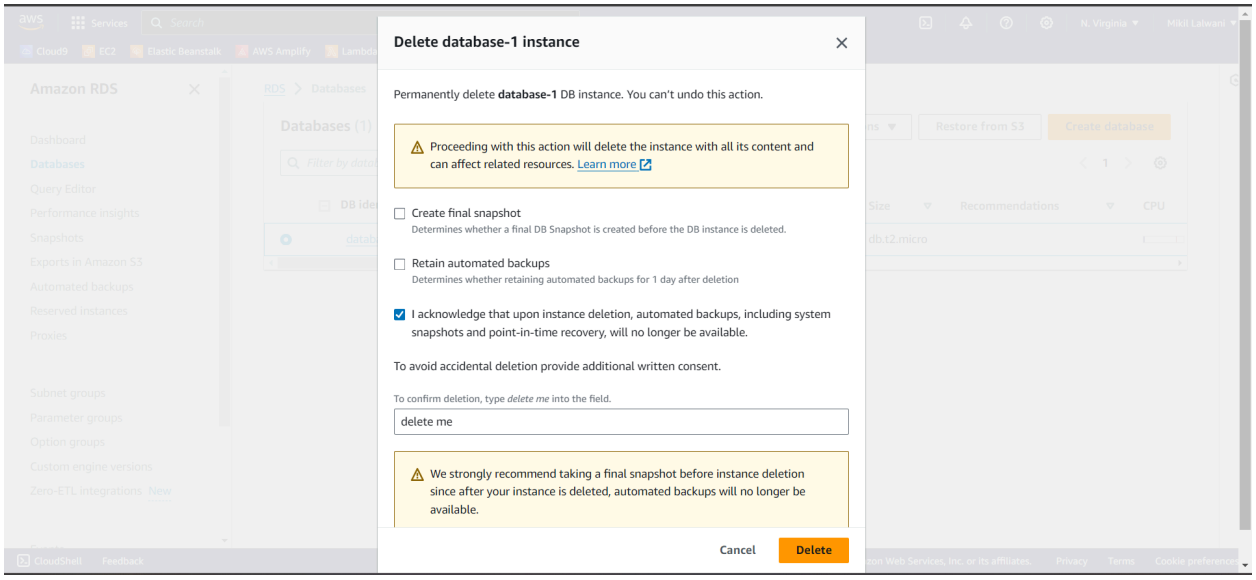

MySQL Workbench
database-1
File Edit View Query Database Server Tools Scripting Help
Navigator
SCHEMAS
Filter objects
sys
Administration Schemas
Information
No object selected
Object Info Session
Query 1
Limit to 1000 rows
1 • select * from student;
2
Result Grid Filter Rows: Export: Wrap Cell Content:
roll name city
1 john thane
2 ram mumbai
3 suresh navi mumba
Result Grid
Form Editor
Field Types
student 3
Read Only
SQL Additions
Jump to
Automatic context help is disabled. Use the toolbar t manually get help for the current caret position or t toggle automatic help.
Context Help Snippets
Output
Action Output
Time Action Message Duration / Fetch
7 18:14:31 insert into student values(3,'suresh','navi mumbai') 1 row(s) affected, 1 warning(s): 1265 Data truncated for column 'city' at row 1 0.203 sec
8 18:15:26 show tables 1 row(s) returned 0.203 sec / 0.000 sec
9 18:16:15 select * from student LIMIT 0, 1000 3 row(s) returned 0.188 sec / 0.000 sec





Step 26: Now delete the instance (once you have done with it)
Select instance go to action stop instance and then delete instance





Conclusion -

Thus we have successfully learned about DBaaS and implemented it on AWS.