

## Azure Databases

Azure offers a wide range of database services tailored for different needs—whether you're building web apps, enterprise systems, or analytics platforms. Here's a quick overview of the main types of Azure Databases:

### 1. Relational

- a. Azure SQL (SQL Server) Database
- b. Azure Database for PostgreSQL
- c. Azure Database for MySQL
- d. Azure Database for MariaDB
- e. Oracle Database@Azure

### 2. NoSQL

- a. Azure Cosmos DB
- b. MongoDB
- c. Azure Table Storage

### 3. Data warehouse

- a. Azure Synapse Analytics

As part of the Azure Bootcamp, we'll dive into Azure Database for MySQL—a fully managed relational database service built on the MySQL Community Edition.

In this session, we'll explore:

- What is Azure Database for MySQL?
- How to create a MySQL database in Azure
- How to access and connect to it securely
- How to delete the database when it's no longer needed

Whether you're new to MySQL or looking to understand how it works in the Azure ecosystem, this hands-on walkthrough will help you get started with ease.

## Azure Database for MySQL

Azure Database for MySQL is a fully managed relational database service based on the open-source MySQL Community Edition. It handles maintenance, backups, scaling, and security—so you can focus on building your applications.

Key Features:

- **Managed Service:** No need to manage infrastructure or updates.
- **Built-in Security:** Data encryption at rest and in transit.
- **Scalability:** Scale compute and storage independently.
- **High Availability:** Automatic failover and backups.
- **Flexible Pricing:** Pay-as-you-go or reserved capacity.

To access the Azure portal, visit <https://portal.azure.com/#home>, Once on the homepage, click on '**More/All services**' in the left-hand menu or quick link to view the full list of available Azure services

The screenshot shows the Microsoft Azure homepage. At the top, there's a navigation bar with 'Microsoft Azure' and an 'Upgrade' button. Below it is a search bar and a Copilot icon. On the right, there's a user profile with the email 'velaniankits@gmail.com' and 'DEFAULT DIRECTORY PELAMAN'. The main area is titled 'Azure services' and includes a 'Create a resource' button and links for 'SQL databases', 'Subscriptions', 'Resource groups', 'Azure Database for MySQL...', 'Virtual machines', 'All resources', 'Cost Management...', and 'App Services'. A red box highlights the 'More services' link, which has an arrow icon. Below this is a 'Resources' section with tabs for 'Recent' (selected) and 'Favorite', showing a single item: 'SUB-SIT-AZURE-BOOTCAMP' (Subscription, Last Viewed 4 days ago). There's also a 'See all' link. At the bottom, there's a 'Navigate' section with links for 'Subscriptions', 'Resource groups', 'All resources', and 'Dashboard'.

### Available Services on Microsoft Azure

The screenshot shows the 'All services' page in the Microsoft Azure portal. At the top, there's a navigation bar with 'Microsoft Azure' and an 'Upgrade' button. Below it is a search bar and a Copilot icon. On the right, there's a user profile with the email 'velaniankits@gmail.com' and 'DEFAULT DIRECTORY PELAMAN'. The main area is titled 'All services' and includes a 'Filter services' dropdown, 'Service providers: All', and 'Release Status: All' buttons. A 'Detail view' toggle is on the right. The page is divided into sections by category. Under 'Categories', there are links for 'AI + machine learning', 'Analytics', 'Compute', 'Containers', 'Databases', 'Dev/Ops', 'General', 'Hybrid + multicloud', 'Identity', 'Integration', 'Internet of Things', 'Management and governance', 'Migration', 'Mixed reality', 'Monitor', 'Networking', 'Security', 'Storage', and 'Web & Mobile'. The 'AI + machine learning' section is expanded, showing services like 'Azure Machine Learning', 'AI Search', 'Bot Services', 'Custom vision', 'Immersive readers', 'Azure Native Arize AI Cloud Service', 'Speech services', 'Azure Synapse Analytics', 'Azure AI Video Indexer', 'Computer vision', 'Document intelligences', 'Language', 'Azure OpenAI', and 'Translators'. The 'Analytics' section is also expanded, showing services like 'Analysis Services', 'Data Lake Analytics', 'HDInsight clusters', 'Azure Data Explorer Clusters', 'Power BI Embedded', 'Apache Airflow™ on Astro - An Azure Native ISV...', 'Data Lake Storage Gen1', 'Informatica Intelligent Data Management Cloud', 'Data Share invitations', 'Apache Kafka® & Apache Flink® on Confluent...', 'Data factories', 'Azure Databricks', 'Microsoft Graph Data Connect', 'Data Shares', 'Event Hubs', and 'Ocean Database Platform'.

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Navigate to '**Databases**' to access the full range of Azure-supported database services

The screenshot shows the Microsoft Azure portal's 'All services' page. On the left, there is a sidebar with various categories like AI + machine learning, Analytics, Compute, Containers, and Databases. The 'Databases' category is highlighted with a red box. The main area lists several database services: Azure Cosmos DB, Azure Database for PostgreSQL flexible servers, Azure SQL Database Hyperscale, Azure Cosmos DB for MongoDB (vCore), Azure Database for MySQL flexible servers, Azure Managed Instance for Apache Cassandra, MongoDB Atlas (PARTNER PREVIEW), Neon Serverless Postgres (PARTNER), Oracle Database@Azure, SQL databases, SQL managed instances, SQL virtual machines, Azure Arc data controllers, PostgreSQL servers – Azure Arc (PREVIEW), SQL managed instances - Azure Arc, Azure Cache for Redis, Azure Database Migration Services, Elastic Job agents, Managed databases, Azure Managed Redis, and SQL Server stretch databases. There are also links for 'Give feedback' and 'Help improve this page'.

To create a MySQL database on Azure, select '**Azure Database for MySQL – Flexible Server**' from the list of database services.

This screenshot is similar to the one above, showing the 'All services' page in the Microsoft Azure portal. The 'Databases' category is again highlighted with a red box. In the main list of services, the 'Azure Database for MySQL flexible servers' option is highlighted with a red box. The other services listed are the same as in the previous screenshot.

This action will navigate you to the 'Azure Database for MySQL – Flexible Server' section within the Azure portal.

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The screenshot shows the Azure portal interface for managing MySQL databases. At the top, there's a search bar and filter options like 'Subscription equals all', 'Resource Group equals all', and 'Location equals all'. Below the search bar, a message says 'You are viewing a new version of Browse experience. Click here to access the old experience.' A large central area displays a MySQL icon and a message stating 'No Azure Database for MySQL flexible servers to display'. It highlights that Azure Database for MySQL Flexible Server offers flexible deployment options with advanced customization features for optimized performance and cost efficiency. A prominent blue button labeled '+ Create' is centered, with a red box drawn around it to indicate the action point.

Click on '**Create**' to initiate the setup of a new MySQL database on Azure

This screenshot shows the 'Select Azure Database for MySQL deployment option' page. It lists two options: 'Flexible server' and 'Wordpress + MySQL Flexible server'. Each option has a 'Create' button. The 'Flexible server' section includes a detailed description of its benefits: best for production workloads requiring zone resiliency, predictable performance, maximum control with IOPS scaling, custom maintenance window, cost optimization controls, and simplified developer experience. The 'Wordpress + MySQL Flexible server' section describes it as a state-of-the-art publishing platform with a focus on aesthetics, web standards, and usability. The 'Flexible server' section's 'Quick Create' button is highlighted with a red box.

Click on '**Quick Create**' to proceed with a simplified setup of your MySQL database

This screenshot is identical to the previous one, showing the 'Select Azure Database for MySQL deployment option' page. The 'Flexible server' section is highlighted, and its 'Quick Create' button is circled with a red box to emphasize the next step in the process.

Fill in the required details to create the database. To ensure the database name is unique, please include your USN (University Serial Number) in the name.

Server Name: \_\_\_\_\_your usn\_\_\_\_\_  
Administrator login: user  
Password: Welcome@Azure

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Microsoft Azure Upgrade Search resources, services, and docs (G+)

All services > Azure Database for MySQL flexible servers > Select Azure Database for MySQL deployment option >

### Flexible server

Microsoft

**Project details**

Select the subscription to manage deployed resources and costs. Use resource groups like folders to organize and manage all your resources.

Subscription \*  Standard\_D2ds\_v4 **175.93**

Resource group \*  Create new **0.131**

**Server details**

Enter required settings for this server, including picking a location and configuring the compute and storage resources.

Server name \*  **175.93**

Region \*  **8.38**

Availability zone \*  **0.131**

**Authentication**

Administrator login \*  **175.93**

Password \*  **184.31**

Confirm password \*  **184.31**

**Workload details** (Compare workload type)

Workload type \*  Dev/Test  Standard  Enterprise

Choose one of these workload types to quickly configure the server based on your needs. You can modify the configuration after creation.

Add firewall rule for current IP address

**High availability**

Same zone or Zone redundant high availability is billed on usage in per million request increments. [Learn more](#)

**High availability** **184.31/month**

Same zone or Zone redundant high availability

**Auto scale IOPS**

Auto scale IOPS is billed on usage in per million request increments. [Learn more](#)

**Backup Retention**

Backup retention is billed based on additional storage used for retaining backups. [Learn more](#)

**Bandwidth**

For outbound data transfer across services in different regions will incur additional charges. Any inbound data transfer is free. [Learn more](#)

**Estimated total** **368.62/month**

Prices reflect an estimate only. [View Azure pricing calculator](#). Final charges will appear in your local currency in cost analysis and billing views.

**Review + create** **Next : Tags >**

Scroll down, Check on Recover from regional outage or disaster

**Workload details** (Compare workload type)

Workload type \*  Dev/Test  Standard  Enterprise

Choose one of these workload types to quickly configure the server based on your needs. You can modify the configuration after creation.

Add firewall rule for current IP address

**High availability**

Same zone and zone redundant high availability provide additional server resilience in the event of a failure.

Enable high availability \*

High availability mode \*  Same zone - a standby server is always available within the same zone as the primary server  Zone redundant - a standby server is always available within another zone in the same region as the primary server

**Backup configuration**

Backup redundancy option  Geo-redundant

Geo-redundancy \*  Recover from regional outage or disaster

Tell us more about your MySQL workload? (Optional)

**Review + create** **Next : Tags >**

Click on 'Next: Tags' and specify appropriate tag names to support documentation and resource tracking.

All services > Azure Database for MySQL flexible servers > Select Azure Database for MySQL deployment option >

## Flexible server ...

Microsoft

Tags are name/value pairs that enable you to categorize and view consolidated billing by applying the same tag to multiple resources and resource groups.

Note that if you create tags and then change resource settings on other tabs, your tags will be automatically updated.

Name	Value	Resource	
TRAINER	ANKIT	Server	
OWNER	STUDENT	Server	
		Server	

**Review + create**

< Previous : Basics

Next : Review >

Add relevant tags for your MySQL server to support organization and tracking, then click on '**Next: Review**' to proceed

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### Flexible server ...

Microsoft

! Server name cannot be changed after server is created. Review these options carefully before provisioning.

Basics Tags Review

#### Creation time

Estimated Server Creation Time (in minutes) 5

#### Product details

Azure Database for MySQL  
by Microsoft  
[Terms of use](#) | [Privacy policy](#)

#### Basics

Subscription	SUB-SIT-AZURE-BOOTCAMP
Resource group	RG-MCA
Server name	1si11mca60
Administrator login	user
Location	South India
Availability zone	No preference
High availability	Enabled
High availability	Same zone
MySQL version	8.0
Workload type	Production Standard
Compute + storage	GeneralPurpose, D2ds, 2 vCores, 8 GiB RAM, 64 GiB storage, Auto scale IOPS
Backup redundancy	Geo-redundant
Zonal Resiliency	No

#### Tags

TRAINER	ANKIT
OWNER	STUDENT

! If you need to modify the default settings, please click on [Advanced Create](#)

#### Estimated costs

<span style="color: orange;">!</span> Compute Sku	USD 175.93/month
Standard_D2ds_v4	175.93
<span style="color: orange;">!</span> Storage	USD 8.38/month
Storage selected 64 GiB (USD 0.131 per GiB)	64 x 0.131
<span style="color: orange;">!</span> Auto scale IOPS	
Auto scale IOPS is billed on usage in per million request increments. <a href="#">Learn more</a>	
<span style="color: orange;">!</span> High availability	USD 184.31/month
Same zone or Zone redundant high availability	
<span style="color: orange;">!</span> Backup Retention	
Backup retention is billed based on additional storage used for retaining backups. <a href="#">Learn more</a>	
<span style="color: orange;">!</span> Bandwidth	
For outbound data transfer across services in different regions will incur additional charges. Any inbound data transfer is free. <a href="#">Learn more</a>	

Estimated total USD 368.62/month

Prices reflects an estimates only. [View Azure pricing calculator](#). Final charges will appear in your local currency in cost analysis and billing views.

! If you need to modify the default settings, please click on [Advanced Create](#)

**Create**

< Previous : Tags

[Download a template for automation](#)

Review the MySQL database configuration and estimated cost. Once everything looks correct, click on '**Create**' to deploy the database.

Deployment is in progress

Resource	Type	Status	Operation details
1si11mca60	Microsoft.DBforMySQL/flexibleServers	Accepted	<a href="#">Operation details</a>

Deployment is in progress. Your MySQL server will be available shortly and ready for use.

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The screenshot shows the Microsoft Azure Overview page for a MySQL deployment named 'MySQLFlexibleServer\_8faa3d60684b11f0bf1a8f7d2530d179'. The status is 'Your deployment is complete'. Key details include:

- Deployment name: MySQLFlexibleServer\_8faa3d60684b11f0bf1a8f7d2530d179
- Subscription: SUB-SIT-AZURE-BOOTCAMP
- Resource group: RG-MCA
- Start time: 24/7/2025, 10:33:42 am
- Correlation ID: b656394b-6fb5-4622-aac-8cc30c4a6473

Next steps include managing the server, setting up public access connectivity, learning about private access connectivity, and setting up monitoring alerts. A red box highlights the 'Go to resource' button.

MySQL deployment is complete. Click on 'Go to resource' to access your newly created MySQL server.

The screenshot shows the Microsoft Azure Overview page for a MySQL database named '1si11mca60'. Key details include:

- Subscription: SUB-SIT-AZURE-BOOTCAMP
- Subscription ID: 714020e-6f63-4f5e-a06a-3c8e50f87e24
- Resource group: RG-MCA
- Status: Ready
- Location: South India
- Tags: TRAINER : ANKIT OWNER : STUDENT

A warning message at the top states: "Azure Database for MySQL – Certificate Change: To maintain our security and compliance standards, we'll be changing the root certificates for Azure Database for MySQL Flexible Server after 31 July 2025. If you're using Transport Layer Security (TLS) with root certificate verification, you'll need to follow these instructions to add the two new certificates to your root certificate store before 31 July 2025."

The 'Getting started' section includes links for Properties, Recommendations, Monitoring, and Tutorials.

Great job! The MySQL server deployment is complete and your environment is ready for use.

## Accessing MySQL Server

Accessing a MySQL Server using tools like MySQL Workbench, Visual Studio Code (VS Code), or other IDEs involves a few common steps.

### Configure the connection

Host/Server:

Port: 3306

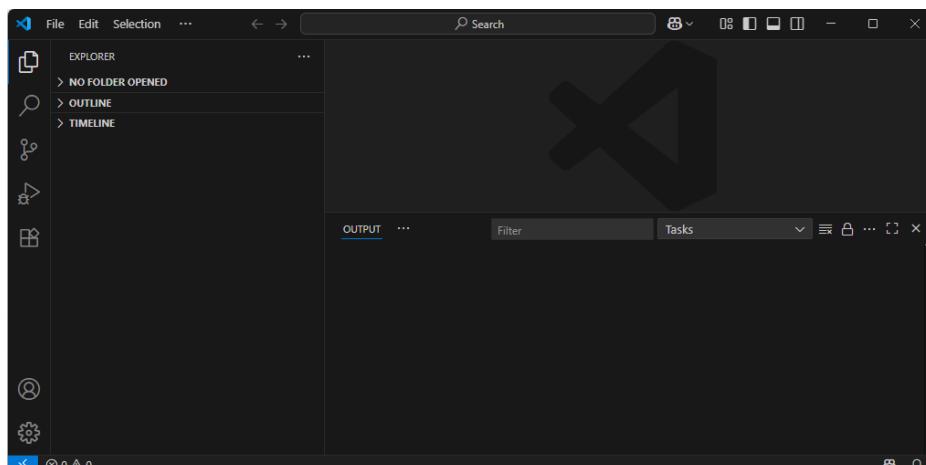
User:

Password:

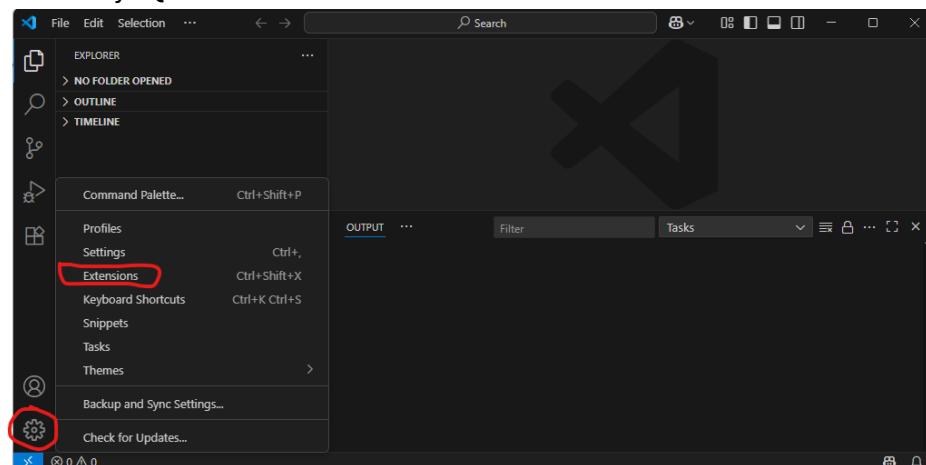
Database (optional):

We will use Visual Studio Code to establish a connection with the Azure Database for MySQL server.

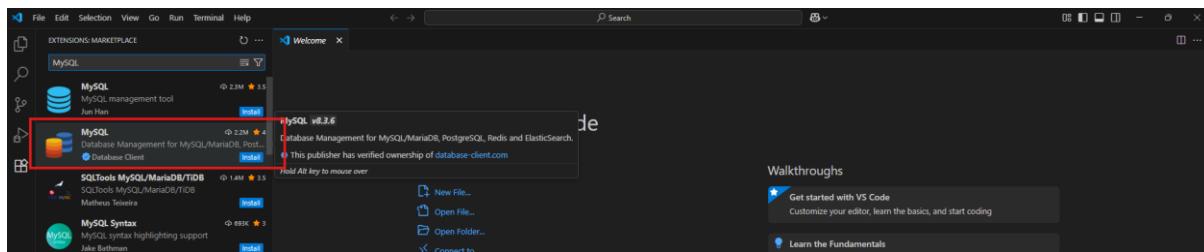
Open VS Code in Personal Laptop/PC.



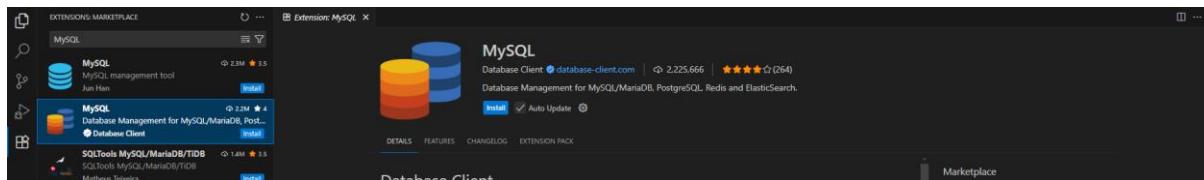
### Install MySQL Client from VS Code Extension



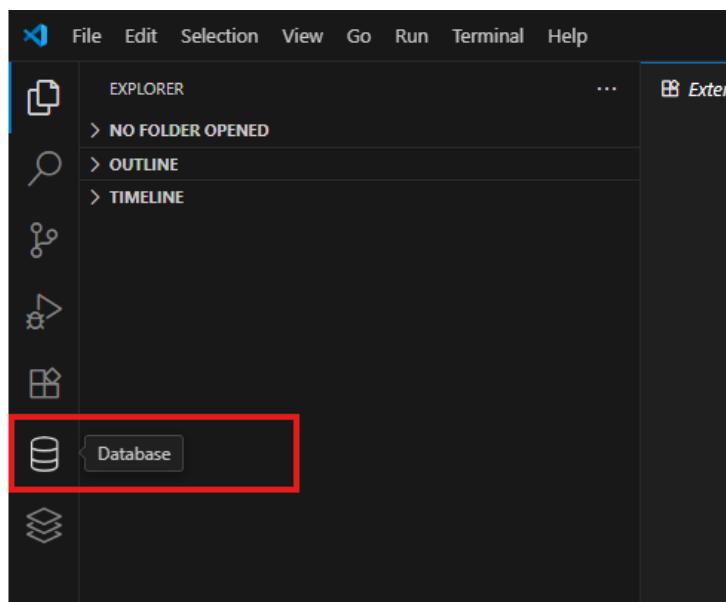
Open the Extensions panel in VS Code and type 'MySQL Oracle' in the search bar to locate the **MySQL Oracle**



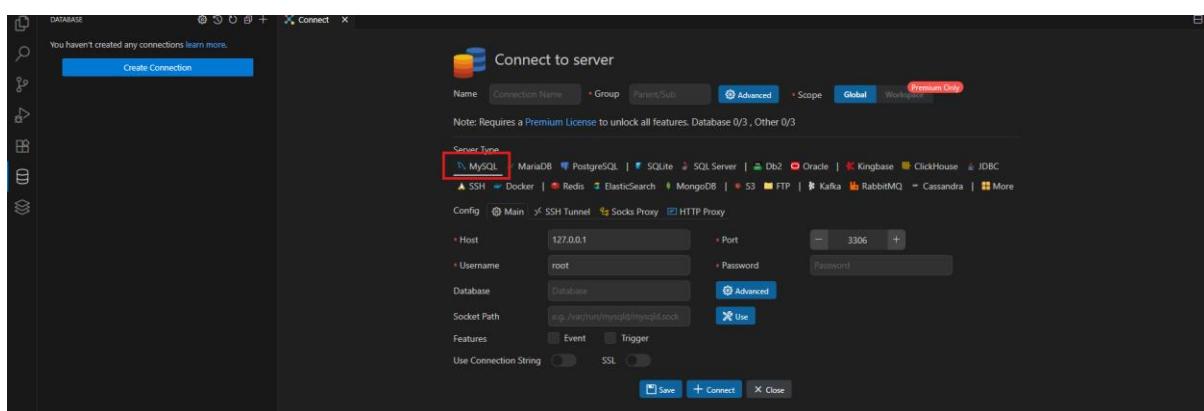
### Click on Install

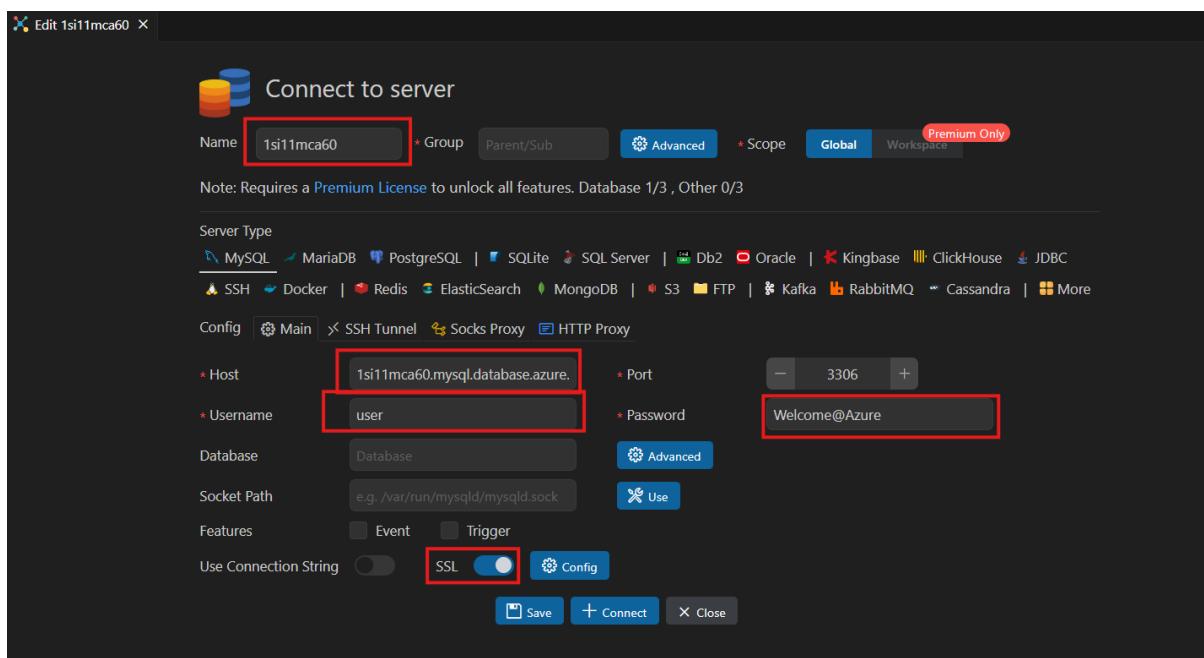


It will be added in left navigation, Click on Database to configure database connection.

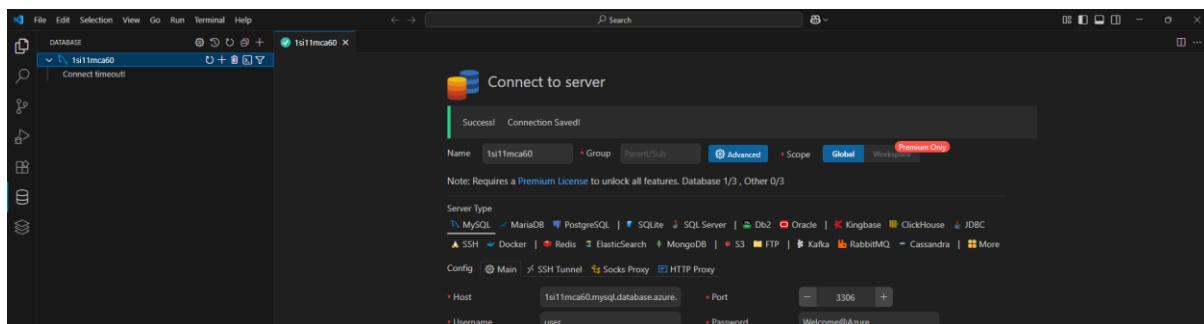


### Click on Create Connection





### Connection timeout error



By default, all services on Azure are restricted from public network access. To connect to services like Azure Database, you must explicitly whitelist your IP address in the network settings

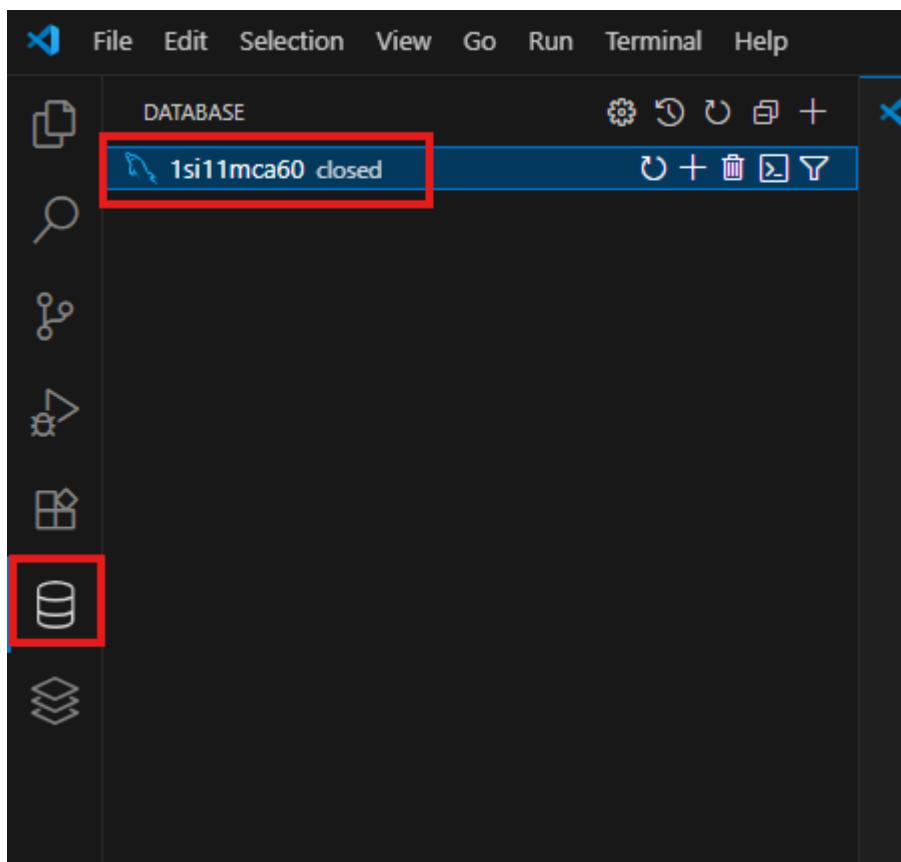
## AZURE STUDENT BOOTCAMP – SIT, TUMKUR

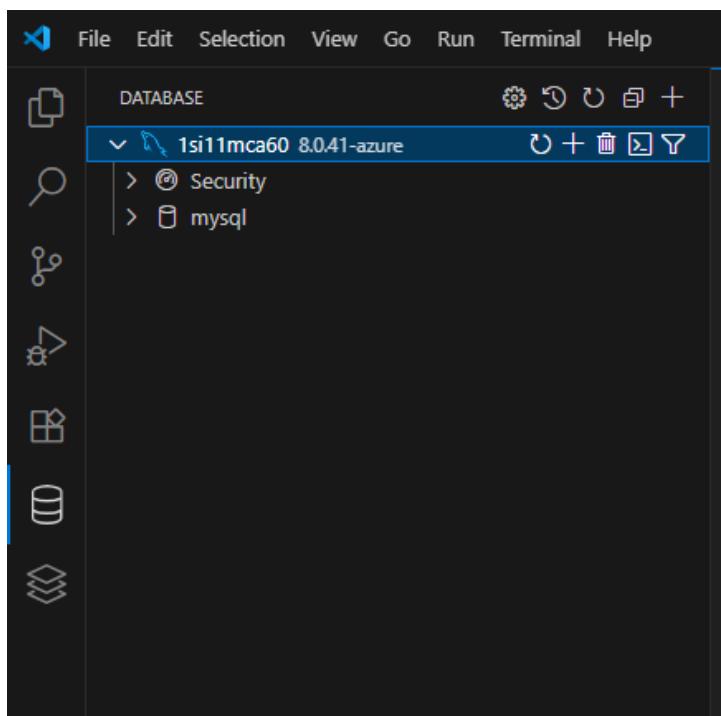
The screenshot shows the Azure portal interface for managing a MySQL flexible server named '1si1mca60'. The left sidebar is open, showing various service categories like Overview, Activity log, Access control (IAM), Tags, Diagnose and solve problems, Learning center, Resource visualizer, Settings, Compute + storage, Networking, Databases, Connect, Server parameters, Replication, Maintenance, High availability, Backup and restore. Under the Networking section, there's a 'Firewall rules' subsection. A new rule has been created with the name 'ClientIPAddress\_2025-7-24\_22-49-54' and the IP range '0.0.0.0 - 255.255.255.255'. The 'Save' button at the top of the page is highlighted with a red box.

Click on Save button to save the firewall rule for IP Address.

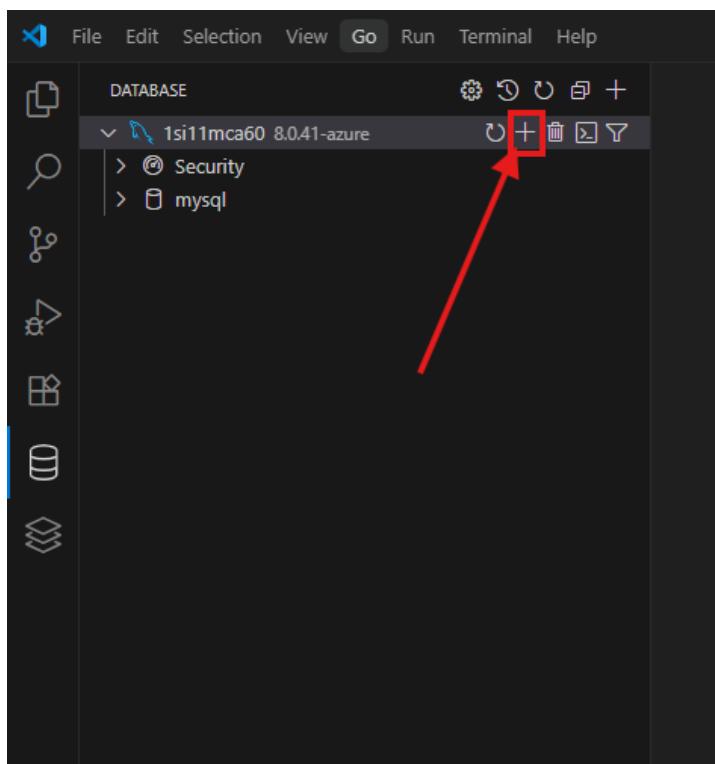
This screenshot shows the same Azure portal interface as the previous one, but now the 'Save' button is highlighted with a red box, indicating that the changes have been successfully applied. The rest of the interface and the newly created firewall rule are identical to the previous screenshot.

Go back to VS Code and retry on the database connection. Double Click on database connection name,





Click on + icon on database connection name



Create new database **STUDENT**

The screenshot shows the MySQL Workbench interface. In the left sidebar, under the 'DATABASE' section, there is a connection to '1si11mca60 8.0.41-azure'. Inside this connection, there are three databases listed: 'Security', 'mysql', and 'student'. On the right side, a query editor window is open with the title 'create-db-template.sql'. The SQL code in the editor is:

```

CREATE DATABASE STUDENT;
DEFAULT CHARACTER SET = 'utf8mb4';

```

This screenshot is similar to the previous one, but the 'Run' button in the toolbar above the query editor is highlighted with a red box. This indicates that the user is about to execute the SQL command to create the 'STUDENT' database.

## Write Query

**CREATE DATABASE STUDENT;**

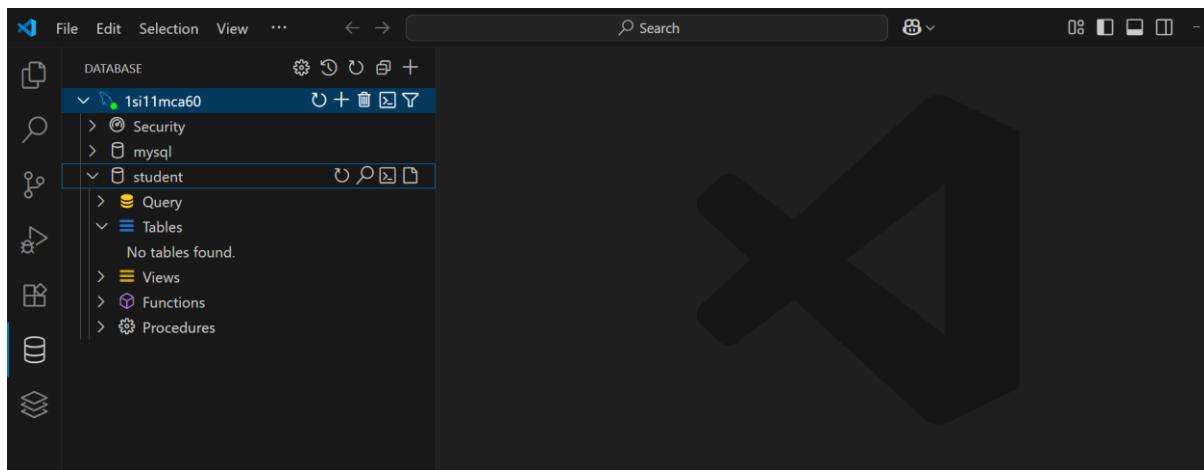
The screenshot shows the MySQL Workbench interface after the query has been executed. The 'Result' tab at the bottom displays the output of the query:

```

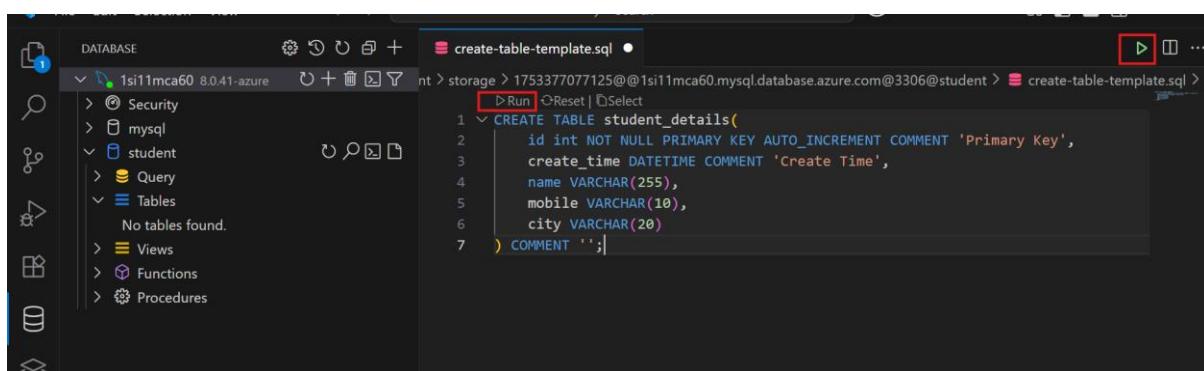
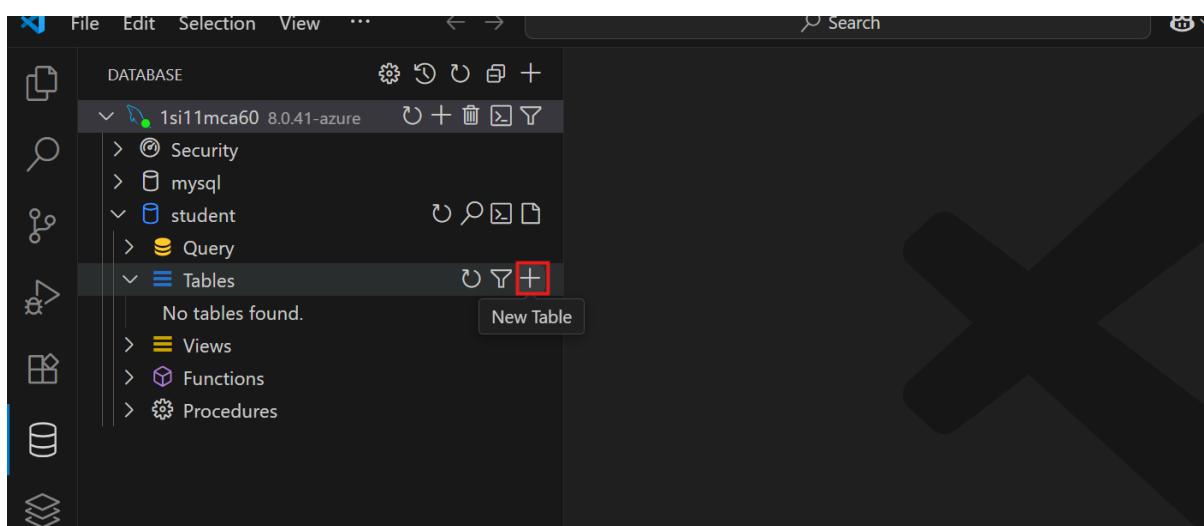
CREATE DATABASE STUDENT
AffectedRows : 1

```

In the status bar at the bottom, it says 'Cost: 254ms'. The 'create-db-template.sql' file in the query editor shows a green checkmark next to the first line of the query, indicating it was successful.



Create **student\_details** table in STUDENT database



Run CREATE TABLE query, to create student\_details table.

```
CREATE TABLE student_details(
    id          int PRIMARY KEY AUTO_INCREMENT,
    create_time DATETIME COMMENT 'Create Time',
    name        VARCHAR(255),
    mobile      VARCHAR(10),
    city        VARCHAR(20)
);
```

The screenshot shows the MySQL Workbench interface. On the left, the database structure is displayed under the 'student' schema, showing a table named 'student\_details' with columns: id (Primary Key), create\_time, name, mobile, and city. On the right, a SQL editor window titled 'create-table-template.sql' contains the following code:

```

CREATE TABLE student_details(
    id int NOT NULL PRIMARY KEY AUTO_INCREMENT COMMENT 'Primary Key',
    create_time DATETIME COMMENT 'Create Time',
    name VARCHAR(255),
    mobile VARCHAR(10),
    city VARCHAR(20)
) COMMENT '';

```

Below the editor, the results pane shows the executed SQL statement and the message 'AffectedRows : 0'.

Run Select Query on student\_details

The screenshot shows the MySQL Workbench interface. On the left, the database structure is displayed under the 'student' schema, showing the 'student\_details' table. On the right, a SQL editor window titled 'C:\> Users > avelani > .dbclient > storage > 1753377077125@@1si11mca60.mysql.database.azure.com@3306@student >' contains the following query:

```

SELECT * FROM student_details;

```

Below the editor, the results pane shows the table structure for 'student\_details' with columns: id, create\_time, name, mobile, and city. The message 'Total 0' is displayed at the bottom of the results pane.

Run Insert query on student\_details to insert sample records.

```

INSERT INTO student_details (name, mobile, city)
VALUES ('ANKIT', '99999999', 'BANGALORE');

```

The screenshot shows the MySQL Workbench interface. On the left, the database structure is displayed under the 'student' schema, showing the 'student\_details' table. On the right, a SQL editor window titled 'C:\> .dbclient > storage > 1753377077125@@1si11mca60.mysql.database.azure.com@3306@student >' contains the following query:

```

INSERT INTO student_details (name, mobile, city)
VALUES ('ANKIT', '99999999', 'BANGALORE');

```

Below the editor, the results pane shows the message 'AffectedRows: 1'.

Run Select Query on student\_details

```
elani > .dbclient > storage > 1753377077125@@1si11mca60.mysql.database.azure.com@3306@student > student.sql > .
    ▶ Run | +Tab | JSON
✓ 1   SELECT * FROM student_details;  22ms
```

student\_details X ...

Search Results Export Cost: 35ms

< 1 > Total 1

	Q	id	create_time	name	mobile	city
		int	datetime	varchar(255)	varchar(10)	varchar(20)
	>	1	(NULL)	ANKIT	99999999	BANGALORE

```
SELECT * FROM student_details;
```