

Ansh Ranjan

Azure Data

EXERCISE 2 - Introduction to Azure Databases

TASK 1: Deploy a sample database in Azure Cosmos DB and Azure SQL Database

- SQL DATABASE

1. Go to SQL Databases > Create > Enter details > Create a new database server if you do not have existing option.

Project details

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

Subscription * ⓘ

Resource group * ⓘ [Create new](#)

Database details

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

Database name * ✓

Server * ⓘ

2. Under Network tab set Admin login and Password for your SQL database

Authentication method

☐ Use Microsoft Entra-only authentication

☐ Use both SQL and Microsoft Entra authentication

☒ Use SQL authentication

Server admin login * ✓

Password * ✓

Confirm password * ✓

3. Picking serverless computer for cheaper computation

[Learn more](#) about migrating your data into hyperscale.

Compute tier

☐ **Provisioned** - Compute resources are pre-allocated. Billed per hour based on vCores configured.

☒ **Serverless** - Compute resources are auto-scaled. Billed per second based on vCores used.

4. Under Network settings, allow connection to database

Connectivity method * ⓘ

☐ No access

☒ Public endpoint

☐ Private endpoint

Firewall rules

Setting 'Allow Azure services and resources to access this server' to Yes allows coming from the Azure boundary, that may or may not be part of your subscription. [Learn more](#)

Setting 'Add current client IP address' to Yes will add an entry for your client IP address

Allow Azure services and resources to access this server *

Add current client IP address *

- COSMOS DB MONGO DB

1. Open Cosmos DB > Create > Cozmos DB for MongoDB

Which API best suits your workload?

Azure Cosmos DB is a fully managed NoSQL and relational database service for building scalable, high performance applications. [Learn more](#)

To start, select the API to create a new account. The API selection cannot be changed after account creation.

Recommended APIs Others

Azure Cosmos DB for NoSQL

Azure Cosmos DB's core, or native API for working with documents. Supports fast, flexible development with familiar SQL query language and client libraries for .NET, JavaScript, Python, and Java.

Create Learn more

Azure Cosmos DB for MongoDB

Fully managed database service for apps written for MongoDB. Recommended if you have existing MongoDB workloads that you plan to migrate to Azure Cosmos DB.

Create Learn more

2. Request Unit database account > Enter details > Review and Create

Project Details

Choose a workload type that best aligns with your goals. This helps us provide an optimized starting point for your Azure Cosmos DB account: each setting to fit your needs or stick to the defaults provided.

Workload Type *

Development / Testing

Balanced cost and performance. Ideal to test and develop an application before going to production.

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

Subscription *

MML Learners

Resource Group *

rg-azuser2967_mml.local-iOYO4

[Create new](#)

Instance Details

Account Name *

ansh-mongodb-cosmos

Configure availability zone settings for your account. You cannot change these settings once the account is created.

Availability Zones

☐ Enable ☒ Disable

3. Your Azure Cosmos DB API for Mongo DB will be created and running

[Home](#) > [Microsoft.Azure.CosmosDB-20250410102317](#) | [Overview](#)

 **ansh-mongodb-cosmos** [✦](#) [☆](#) [⋮](#)

Azure Cosmos DB for MongoDB account (RU)

Search

[+ Add Collection](#) [Refresh](#) [Move](#) [Data Migration](#) [Connect with ADS](#) [Delete Account](#)

Overview

[Activity log](#)
[Access control \(IAM\)](#)
[Tags](#)
[Diagnose and solve problems](#)
[Quick start](#)
[Data Explorer](#)
[Resource visualizer](#)

Essentials

Status : Online
Read Locations : West US 3
Resource group (move) : [rg-azuser2967_mml.local-iOYO4](#)
Write Locations : West US 3
Subscription (move) : [MML Learners](#)
URI : [https://ansh-mo](#)
Subscription ID : 2a3c6418-97b9-4d96-a24b-2c2d7633d375
Server Version : 7.0
Backup policy : Periodic
Capacity mode : Serverless

Collections

Looks like you don't have any collections yet. [Data Explorer](#)

TASK 2: Document key features and use cases for each

Azure Synapse Analytics

Key Features:

- Unified platform for big data and data warehousing.
- Massively Parallel Processing (MPP) for large datasets.
- Integrated pipelines for ETL/ELT with Azure Data Factory.
- Synapse Studio for data exploration and analytics.
- Scalable, secure, and supports machine learning.

Use Cases:

- Data warehousing and big data analytics.
- Business intelligence with Power BI integration.

- Advanced analytics and IoT data processing.

Azure SQL Database

Key Features:

- Fully managed relational database service.
- High availability, scalability, and automated maintenance.
- Elastic pools for resource sharing.
- Advanced security and geo-replication.
- Seamless integration with other Azure services.

Use Cases:

- Transactional workloads (OLTP).
- Backend for web/mobile apps and e-commerce systems.
- ERP/CRM databases and lightweight analytics.

Comparison of Use Cases

Feature/Use Case	Azure Synapse Analytics	Azure SQL Database
Primary Focus	Analytical workloads (OLAP)	Transactional workloads (OLTP)
Data Volume	Petabytes of data	Gigabytes to terabytes of data
Scalability	Massively parallel processing	Elastic scaling for transactional data
Integration	Big data tools, Power BI, Data Lake	Web apps, mobile apps, and business apps
Machine Learning	Advanced analytics and AI workloads	Limited to lightweight analytics
Use Case Examples	Data warehousing, predictive analytics	E-commerce systems, ERP/CRM databases

TASK 3: Perform basic CRUD operations

- SQL DATABASE

1. Go to your DB > Query Editor > Login with admin ID and password

2. You will be presented with query page. Write a query to create a table in your database

Query 1 X

Run Cancel query Save query Export data as Show only Editor

```
1 CREATE TABLE employees (  
2     employee_id INT PRIMARY KEY,  
3     first_name VARCHAR(50),  
4     last_name VARCHAR(50),  
5     salary DECIMAL(10, 2)  
6 );
```

3. Insert records into your database table and read them

anhsqldatabase (azuser2967_mml.local...)

Showing limited object explorer here. For full capability please click here to open Azure Data Studio.

Tables
dbo.employees
Views
Stored Procedures

Query 1 X

Run Cancel query Save query Export data as Show only Editor

```
10 (1, 'John', 'Doe', 55000.00),  
11 (2, 'Jane', 'Smith', 62000.00),  
12 (3, 'Robert', 'Brown', 48000.00),  
13 (4, 'Emily', 'Davis', 71000.00),  
14 (5, 'Michael', 'Johnson', 53000.00);  
15  
16 select * from [dbo].[employees]  
17
```

Results Messages

Search to filter items...

employee_id	first_name	last_name	salary
1	John	Doe	55000.00
2	Jane	Smith	62000.00

4. Updating and Deleting records

```
18 /*Updating Records*/  
19 UPDATE employees SET first_name = 'Smith'  
20 WHERE employee_id = 1;  
21  
22 /*Deleting rows*/  
23 DELETE FROM employees  
24 WHERE employee_id = 5;
```

Results Messages

Query succeeded: Affected rows: 2

- COSMOS DB MONGO DB

1. Go to Data Explorer > Create Database > New Collection > Select Database or create new, give collection id, shard key

New Collection

* Database name ⓘ

☒ Create new ☐ Use existing

AnshDB1

* Collection id ⓘ

ansh-mongodb-collection

* Sharding ⓘ

☐ Unsharded (20GB limit) ☒ Sharded

* Shard key ⓘ

username

2. Once your collection is created > click New Document and enter data in document > Save

The screenshot shows the MongoDB Compass interface. On the left, the sidebar displays the database structure: Home, AnshDB1, and ansh-mongodb-collection. The 'Documents' tab is selected for the 'ansh-mongodb-collection'. The main area shows a query predicate field with the text 'Type a query predicate (e.g., {a:'foo'}), or choose one from the drop down list, or leave empty to query all documents.' Below this, a table lists documents with columns for '_id' and a corresponding value. The first document has '_id' as '1' and a value of 'Ansh'. The second document has '_id' as '2' and a value of 'Rahul'. The third document has '_id' as '3' and a value of 'Mridul'. The right pane shows the JSON representation of the selected document: { "id" : "1", "username" : "Ansh", "age" : "22" }.

3. You can add more documents now that your mongo db is up and running

The screenshot shows the MongoDB Compass interface with the 'Documents' tab selected for the 'ansh-mongodb-collection'. The main area displays a table of documents. The table has columns for '_id', a value, and a 'username' field. The first document has '_id' as '67f75b65acf3ea05c4d3f2cf' and a value of 'Ansh'. The second document has '_id' as '67f75e0dacf3ea05c4d3f2d0' and a value of 'Rahul'. The third document has '_id' as '67f75e29a143450d044e4aec' and a value of 'Mridul'. The right pane shows the JSON representation of the selected document: { "_id" : ObjectId("67f75e29a143450d044e4aec"), "id" : "4", "username" : "Mridul", "age" : "16" }.