

Graded Project
Cloud basics (Azure)
Week 11

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Business Context

A library will have thousands of books available and hundreds of borrowers every single day. This leads to a high number of transactions that need to be tracked and queried very fast. The database used should, therefore also be designed as such.

In this exercise, you deploy an SQL database on Azure according to the given specifications

Learning Outcome

- 1) Deploy an Azure SQL database
- 2) Connect to the database using the query editor
- 3) Run DDL and DML queries on tables

Problem statement

- 1) Create an Azure SQL database with the following specifications
 - a) Database plan: Basic
 - b) Connectivity method: Public Endpoint
 - c) No existing data backup
- 2) Use the query editor to create a table with the following fields and datatypes
 - a) Name: String
 - b) Author: String
 - c) ISBN: Integer
 - d) Price: Integer
 - e) Number of copies available: Integer
- 3) Insert the following values into the table

Name	Author	ISBN	Price	Number of copies available
Pet Sematary	Stephen King	11011123	437	3
The Shining	Stephen King	11679532	345	2
The Haunting on Hill House	Shirley Jackson	11659042	550	6
Dracula	Bram Stoker	11011666	250	4
At the Mountains of	H.P Lovecraft	1145873	599	2

Madness				
Psycho	Robert Bloch	1167903	399	6
The Silence of the Lambs	Thomas Harris	1178902	350	4
A Head Full of Ghosts	Paul Trembley	1167902	450	7
Carrie	Stephen King	1189450	399	4
Bird Box	Josh Malerman	1123670	500	1

4) Write queries to retrieve the following data

- a) Total price of all the books authored by Stephen King
- b) List of all the Books priced above 500
- c) Number of books with less than 3 copies available

1. Create an Azure SQL database with the following specifications

Firstly, we create SQL Server

The screenshot shows the 'Create SQL Database Server' page in the Microsoft Azure portal. The page is titled 'Create SQL Database Server' and is part of the 'SQL servers' section. The 'Basics' tab is selected, and the 'Server details' section is visible. The 'Subscription' is set to 'azuredae' and the 'Resource group' is '(New) greatlearning'. The 'Server name' is 'mysqlsqlserver' and the 'Location' is '(US) East US 2'. The 'Authentication method' is 'Use SQL authentication'. The 'Server admin login' is 'anastasiya', the 'Password' is '*****', and the 'Confirm password' is '*****'. The 'Review + create' button is visible at the bottom.

Microsoft Azure

Search resources, services, and docs (G+/I)

Home > SQL servers >

Create SQL Database Server

Microsoft

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

Subscription * azuredae

Resource group * (New) greatlearning

Create new

Server details

Enter required settings for this server, including providing a name and location.

Server name * mysqlsqlserver

.database.windows.net

Location * (US) East US 2

Authentication

Select your preferred authentication methods for accessing this server. Create a server admin login and password to access your server with SQL authentication, select only Azure AD authentication [Learn more](#) using an existing Azure AD user, group, or application as Azure AD admin [Learn more](#), or select both SQL and Azure AD authentication.

Authentication method

☒ Use SQL authentication

☐ Use only Azure Active Directory (Azure AD) authentication

☐ Use both SQL and Azure AD authentication

Server admin login * anastasiya

Password * *****

Confirm password * *****

Review + create

Next: Networking >

The screenshot shows the 'Create SQL Database Server' page in the Microsoft Azure portal, specifically the 'Networking' tab. The 'Basics' tab is also visible. The 'Networking' section is titled 'Configure networking access for your server.' and contains a 'Firewall rules' section. The 'Allow Azure services and resources to access this server' toggle is set to 'Yes'. The 'Review + create' button is visible at the bottom.

Microsoft Azure

Search resources, services, and docs (G+/I)

Home > SQL servers >

Create SQL Database Server

Microsoft

Basics Networking Additional settings Tags Review + create

Configure networking access for your server.

Firewall rules

Allow Azure services and resources to access this server ☒ Yes No

Review + create

< Previous

Next: Additional settings >

Microsoft Azure

Search resources, services, and docs (G+)

Anastasiya@glcazure.on...
GREATLEARNINGCOMPANY (GL...)

Home > SQL servers >

Create SQL Database Server

Microsoft

BasicsNetworkingAdditional settingsTagsReview + create

Product details

SQL Database Server
by Microsoft
[Terms of use](#) | [Privacy policy](#)

Estimated cost per month
No additional charges

Terms

By clicking "Create", I (a) agree to the legal terms and privacy statement(s) associated with the Marketplace offering(s) listed above; (b) authorize Microsoft to bill my current payment method for the fees associated with the offering(s), with the same billing frequency as my Azure subscription; and (c) agree that Microsoft may share my contact, usage and transactional information with the provider(s) of the offering(s) for support, billing and other transactional activities. Microsoft does not provide rights for third-party offerings. For additional details see [Azure Marketplace Terms](#).

Basics

Subscription

azuredae

Resource group

greatlearning

Server name

mysqlsqlserver

Authentication method

SQL authentication

Server admin login

anastasiya

Location

East US 2

Networking

Allow Azure services to access server

Yes

Additional settings

Enable Microsoft Defender for SQL

Not now

Tags

Create< PreviousDownload a template for automation

Afrer creation SQL Server

Microsoft Azure

Search resources, services, and docs (G+)

Anastasiya@glcazure.on...
GREATLEARNINGCOMPANY (GL...)

Home > Microsoft.SQLServer.createServer_2420170d97ec4e049c5cd248304d98 >

mysqlsqlserver

SQL server

Search (Ctrl+J)

+ Create database + New elastic pool + New dedicated SQL pool (formerly SQL DW) Import database Reset password Move Delete Feedback

Overview

Activity log

Access control (IAM)

Tags

Diagnose and solve problems

Quick start

Settings

Azure Active Directory

SQL databases

SQL elastic pools

DTU quota

Properties

Locks

Data management

Backups

Deleted databases

Fallover groups

Import/Export history

Security

Auditing

Firewalls and virtual networks

Private endpoint connections

Microsoft Defender for Cloud

Essentials

Resource group (Move) : greatlearning

Status : Available

Location : East US 2

Subscription (Move) : azuredae

Subscription ID : 2578e29f-4981-4b17-aa4e-2d2b86ac45e1

Tags (Edit) : [Click here to add tags](#)

Server admin : anastasiya

Firewalls and virtual netw... : [Show firewall settings](#)

Active Directory admin : Not configured

Server name : mysqlsqlserver.database.windows.net

Notifications (0)

Features (6)

Active Directory admin

Allows you to centrally manage identity and access to your Azure SQL databases.

NOT CONFIGURED

Microsoft Defender for SQL

Vulnerability Assessment and Advanced Threat Protection.

NOT CONFIGURED

Automatic tuning

Monitors and tunes your database automatically to optimize performance.

CONFIGURED

Auditing

Track database events and writes them to an audit log in Azure storage.

NOT CONFIGURED

Fallover groups

Automatically manages replication, connectivity and failover for a set of databases.

NOT CONFIGURED

Transparent data encryption

Encryption at rest for your databases, backups, and logs.

SERVICE-MANAGED KEY

Available resources

Filter by name

All types

0 record

Name	Type	Status	Pricing tier
No resources found.			

a) Database plan: Basic

Microsoft Azure

Search resources, services, and docs (G+/I)

Home > Microsoft SQL Server createServer_2420170d97ec4e049c5cd2f48304d98 > mysqlsqlserver > Create SQL Database >

Configure

Feedback

Service and compute tier

Select from the available tiers based on the needs of your workload. The vCore model provides a wide range of configuration controls and offers Hyperscale and Serverless to automatically scale your database based on your workload needs. Alternately, the DTU model provides set price/performance packages to choose from for easy configuration. [Learn more](#)

Service tier: Basic (For less demanding workloads) [Compare service tiers](#)

DTUs: [What is a DTU?](#)

5 (Basic)

Data max size (GB): 2

Cost summary

Cost per DTU (in --)	--
DTUs selected	x 5
ESTIMATED COST / MONTH	-- --

PLEASE CONTACT YOUR RESELLER

Microsoft Azure

Search resources, services, and docs (G+/I)

Home > mysqlsqlserver >

Create SQL Database

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: azuredae

Resource group: greatlearning

Database details

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

Database name: ProjectDB

Server: mysqlsqlserver (East US 2)

Want to use SQL elastic pool? ☐ Yes ☒ No

Compute + storage: Basic
2 GB storage
[Configure database](#)

Backup storage redundancy

Choose how your PITR and LTR backups are replicated. Geo restore or ability to recover from regional outage is only available when geo-redundant storage is selected.

Backup storage redundancy: ☒ Locally-redundant backup storage
☐ Zone-redundant backup storage
☐ Geo-redundant backup storage

[Review + create](#) [Next: Networking >](#)

b) Connectivity method: Public Endpoint

I have created new rule with my (client) IP address

Microsoft Azure

Home > myglsqserver

myglsqserver | Firewalls and virtual networks

SQL server

Search (Ctrl+/) Save Discard Add client IP

Overview
Activity log
Access control (IAM)
Tags
Diagnose and solve problems
Quick start

Settings

- Azure Active Directory
- SQL databases
- SQL elastic pools
- DTU quota
- Properties
- Locks

Data management

- Backups
- Deleted databases
- Failover groups
- Import/Export history

Security

- Auditing
- Firewalls and virtual networks
- Private endpoint connections
- Microsoft Defender for Cloud

Deny public network access

Minimum TLS Version 1.0 1.1 1.2

Connection Policy Default Proxy Redirect

Allow Azure services and resources to access this server Yes No

Client IP address 93.175.235.55

Rule name	Start IP	End IP
MyRule1	93.175.235.55	93.175.235.55

Virtual networks
+ Add existing virtual network + Create new virtual network

Rule name	Virtual network	Subnet	Address Range	Endpoint status	Resource group	Subscription	State
No vnet rules for this server.							

Outbound networking

Restrict network access to a specific set of resources by supplying their fully-qualified domain names. [Learn more](#)

Restrict outbound networking

Restrictions disabled
[Configure outbound networking restrictions](#)

c) No existing data backup

Microsoft Azure

Home > myglsqserver >

Create SQL Database

Microsoft

Subscription azuredae
Resource group greatlearning
Region eastus2
Database name ProjectDB
Server myglsqserver

Compute + storage Basic: 2 GB storage
Backup storage redundancy Locally-redundant backup storage

Networking

Allow Azure services and resources to access this server Yes
Private endpoint None

Security

Transparent data encryption Service-managed key selected
Advanced data security Not now
Sql Ledger(Database) Disabled
Digest Storage Disabled

Additional settings

Use existing data Blank
Collation SQL_Latin1_General_CP1_CI_AS
Maintenance window System default (5pm to 8am)

Tags

Create < Previous Download a template for automation

2. Use the query editor to create a table with the following fields and datatypes

a) Name: String

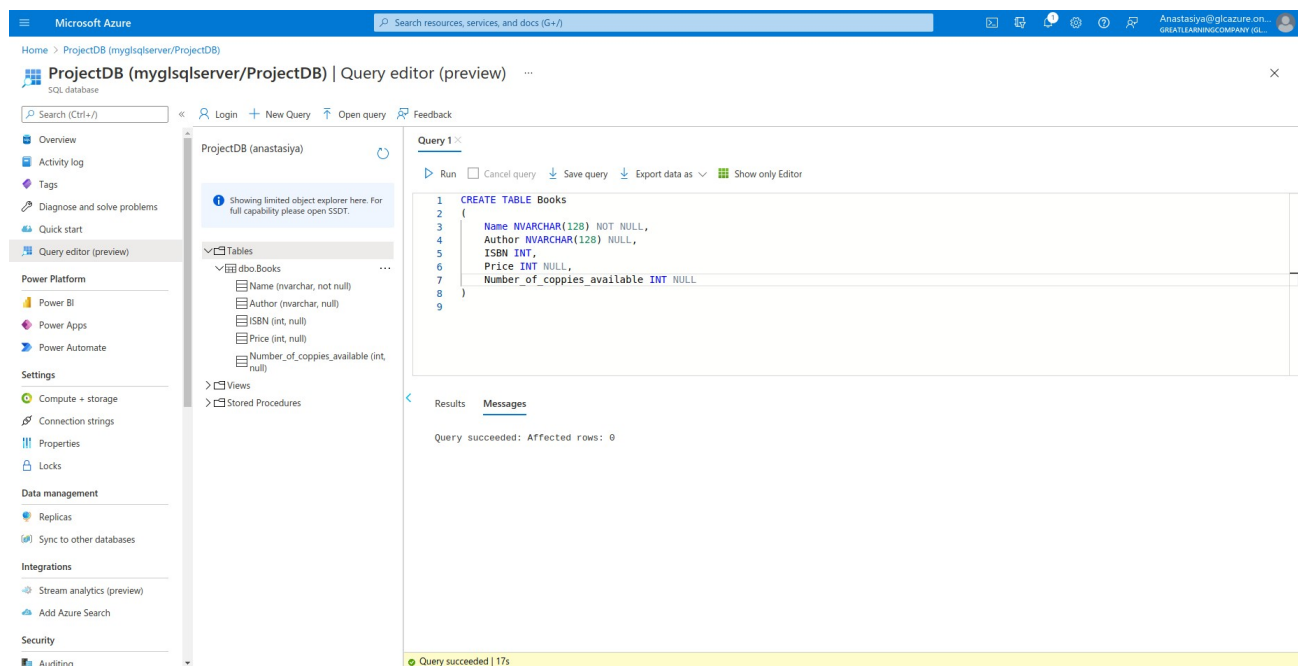
b) Author: String

c) ISBN: Integer

d) Price: Integer

e) Number of copies available: Integer

Because of the given values of data, especially 'Madness' book, only 'Name' column has not null values.



3. Insert the values into the table

Query to insert the values

INSERT INTO [dbo].[Books] (Name, Author, ISBN, Price, Number_of_copies_available)
VALUES

('Pet Sematary', 'Stephen King', 11011123, 437, 3),

('The Shining', 'Stephen King', 11679532, 345, 2),

('The Haunting on Hill House', 'Shirley Jackson', 11659042, 550, 6),

('Dracula', 'Bram Stoker', 11011666, 250, 4),

('At the Mountains of', 'H.P Lovecraft', 1145873, 599, 2),

('Madness', NULL, NULL, NULL, NULL),

('Psycho', 'Robert Bloch', 1167903, 399, 6),

('The Silence of the Lambs', 'Thomas Harris', 1178902, 350, 4),

('A Head Full of Ghosts', 'Paul Trembley', 1167902, 450, 7),

('Carrie', 'Stephen King', 1189450, 399, 4),

('Bird Box', 'Josh Malerman', 1123670, 500, 1);

Microsoft Azure

Home > ProjectDB (mysqlsqlserver/ProjectDB)

ProjectDB (mysqlsqlserver/ProjectDB) | Query editor (preview)

Search (Ctrl+F)

Overview
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Query editor (preview)
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Replicas
Sync to other databases
Integrations
Stream analytics (preview)
Add Azure Search
Security
Auditing

ProjectDB (anastasiya)

Showing limited object explorer here. For full capability please open SSDT.

Tables
Views
Stored Procedures

Query 1 Query 2 Query 3

Run Cancel query Save query Export data as Show only Result

```
1 INSERT INTO [dbo].[Books] (  
2     Name,  
3     Author,  
4     ISBN,  
5     Price,  
6     Number_of_copies_available  
7 )  
8 VALUES  
9 (  
10    ('Pet Sematary',  
11     'Stephen King',  
12     11011123,  
13     437,  
14     3  
15    ),  
16    ('The Shining',  
17     'Stephen King',  
18     11679532,  
19     345,  
20     2  
21    ),  
22    ('The Haunting on Hill House',  
23     'Shirley Jackson',  
24     11659042,  
25     550,  
26     6  
27    ),  
28    ('Dracula',  
29     'Bram Stoker',  
30     11011666,  
31     250,  
32     4  
33    ),  
34    ('At the Mountains of Madness',  
35     'H.P. Lovecraft',  
36     1145873,  
37     599,  
38     2  
39    ),  
40    ('Psycho',  
41     'Robert Bloch',  
42     1167903,  
43     399,  
44     6  
45    ),  
46    ('The Silence of the Lambs',  
47     'Thomas Harris',  
48     1178902,  
49     350,  
50     4  
51    ),  
52    ('A Head Full of Ghosts',  
53     'Paul Trembley',  
54     1167902,  
55     450,  
56     7  
57    ),  
58    ('Carrie',  
59     'Stephen King',  
60     1189450,  
61     399,  
62     4  
63    ),  
64    ('Bird Box',  
65     'Josh Malerman',  
66     1123670,  
67     500,  
68     1  
69    )  
70 )
```

Query succeeded | 1s

Check if all data are correctly loaded into the table 'Books'

```
SELECT *  
FROM [dbo].[Books];
```

Microsoft Azure

Home > ProjectDB (mysqlsqlserver/ProjectDB)

ProjectDB (mysqlsqlserver/ProjectDB) | Query editor (preview)

Search (Ctrl+F)

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Add Azure Search
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ProjectDB (anastasiya)

Showing limited object explorer here. For full capability please open SSDT.

Tables
Views
Stored Procedures

Query 1 Query 2 Query 3

Run Cancel query Save query Export data as Show all

Results Messages

Search to filter items...

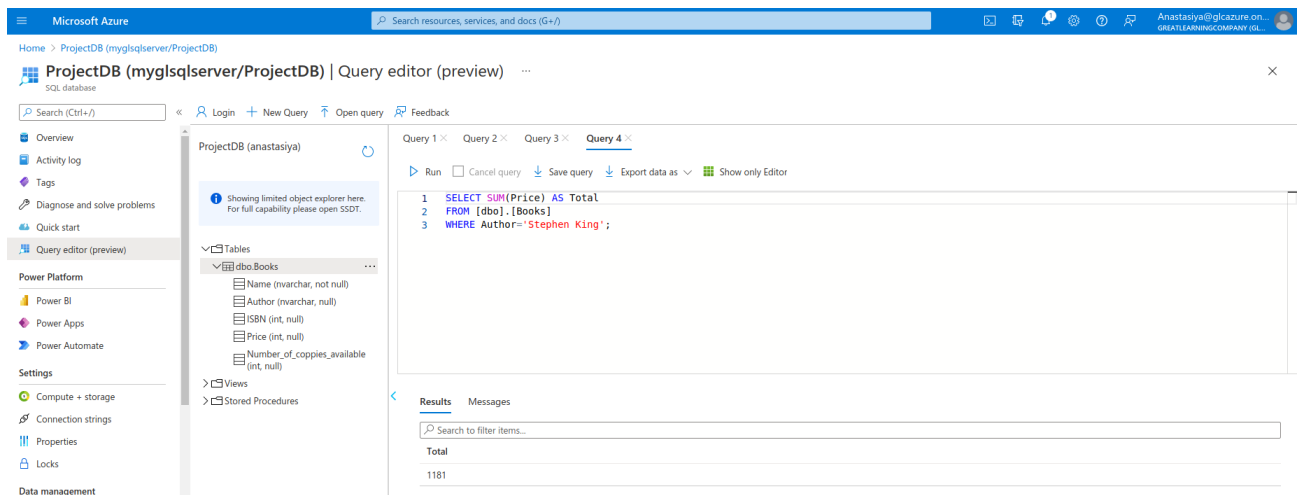
Name	Author	ISBN	Price	Number_of_copies_available
Pet Sematary	Stephen King	11011123	437	3
The Shining	Stephen King	11679532	345	2
The Haunting on Hill House	Shirley Jackson	11659042	550	6
Dracula	Bram Stoker	11011666	250	4
At the Mountains of Madness	H.P. Lovecraft	1145873	599	2
Psycho	Robert Bloch	1167903	399	6
The Silence of the Lambs	Thomas Harris	1178902	350	4
A Head Full of Ghosts	Paul Trembley	1167902	450	7
Carrie	Stephen King	1189450	399	4
Bird Box	Josh Malerman	1123670	500	1

Query succeeded | 1s

4. Write queries to retrieve the following data

a) Total price of all the books authored by Stephen King

- Price for unique books authored by Stephan King



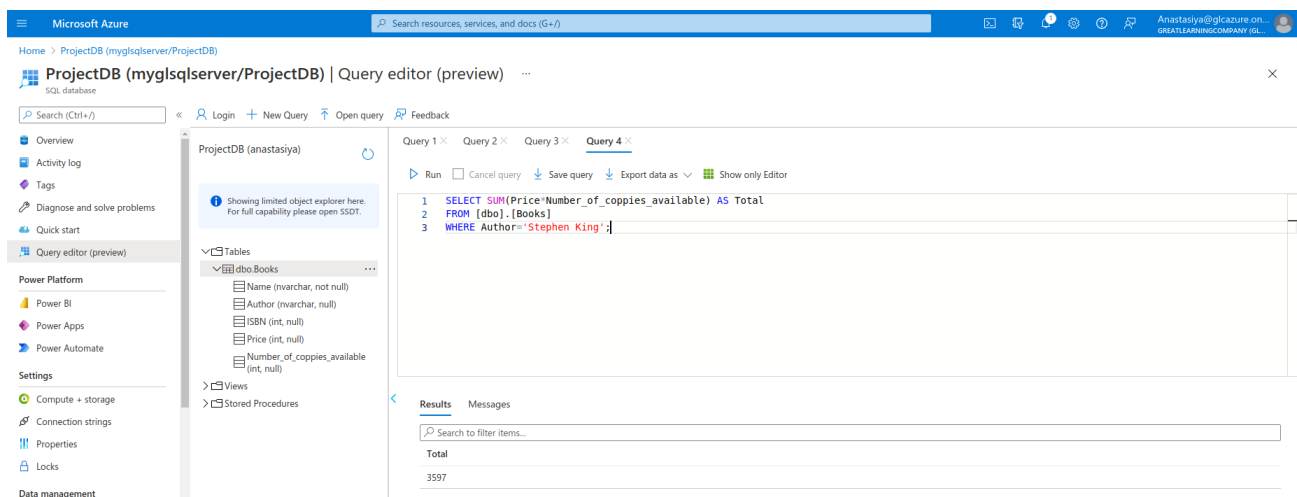
The screenshot shows the Microsoft Azure portal interface. The top navigation bar includes the Microsoft Azure logo, a search bar, and user information. The main content area is titled "ProjectDB (mySqlServer/ProjectDB) | Query editor (preview)". On the left, there is a sidebar with navigation options: Overview, Activity log, Tags, Diagnose and solve problems, Quick start, Query editor (preview), Power Platform, Power BI, Power Apps, Power Automate, Settings, Compute + storage, Connection strings, Properties, Locks, and Data management. The "Query editor (preview)" section is active, showing a list of tables under "dbo.Books": Name (nvarchar, not null), Author (nvarchar, null), ISBN (int, null), Price (int, null), and Number_of_copies_available (int, null). The query editor displays the following SQL query:

```
1 SELECT SUM(Price) AS Total
2 FROM [dbo].[Books]
3 WHERE Author='Stephen King';
```

The results section shows a single row with the total price:

Total
1181

- Price for all copies of books authored by Stephan King



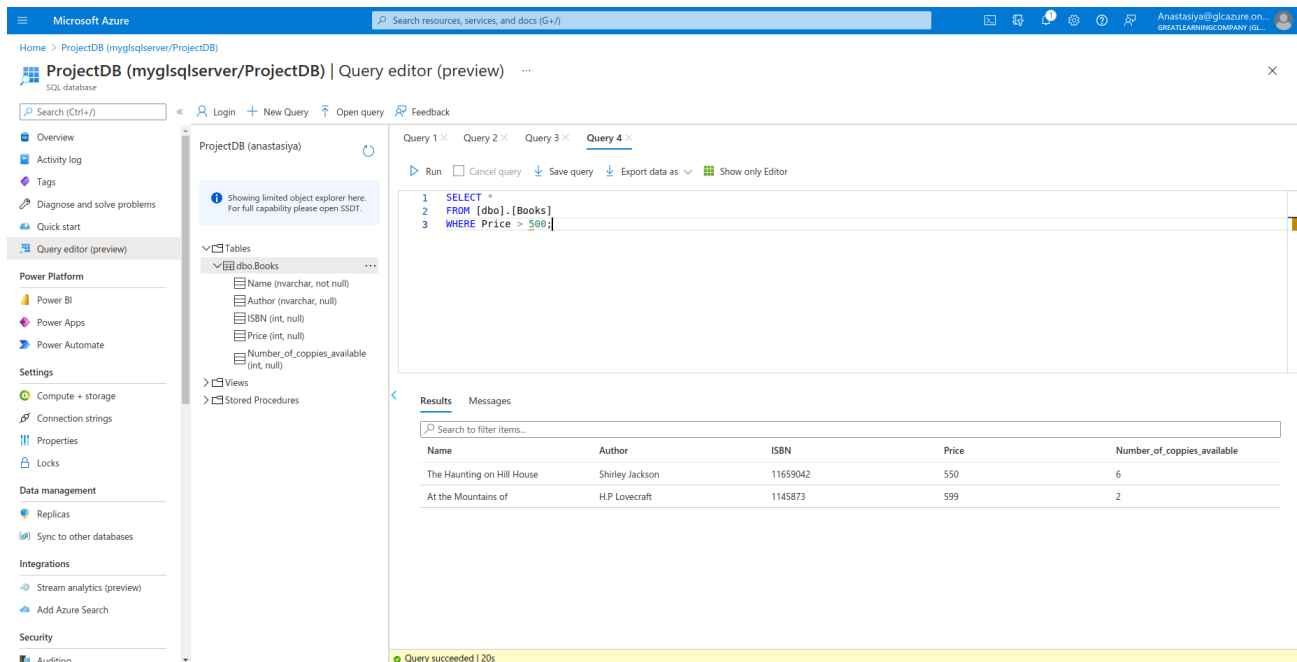
The screenshot shows the Microsoft Azure portal interface. The top navigation bar includes the Microsoft Azure logo, a search bar, and user information. The main content area is titled "ProjectDB (mySqlServer/ProjectDB) | Query editor (preview)". On the left, there is a sidebar with navigation options: Overview, Activity log, Tags, Diagnose and solve problems, Quick start, Query editor (preview), Power Platform, Power BI, Power Apps, Power Automate, Settings, Compute + storage, Connection strings, Properties, Locks, and Data management. The "Query editor (preview)" section is active, showing a list of tables under "dbo.Books": Name (nvarchar, not null), Author (nvarchar, null), ISBN (int, null), Price (int, null), and Number_of_copies_available (int, null). The query editor displays the following SQL query:

```
1 SELECT SUM(Price*Number_of_copies_available) AS Total
2 FROM [dbo].[Books]
3 WHERE Author='Stephen King';
```

The results section shows a single row with the total price:

Total
3597

b) List of all the Books priced above 500



The screenshot shows the Microsoft Azure portal interface for a SQL database named 'ProjectDB'. The 'Query editor (preview)' is open, displaying a SQL query that filters books with a price greater than 500. The query is as follows:

```
1 SELECT *
2 FROM [dbo].[Books]
3 WHERE Price > 500;
```

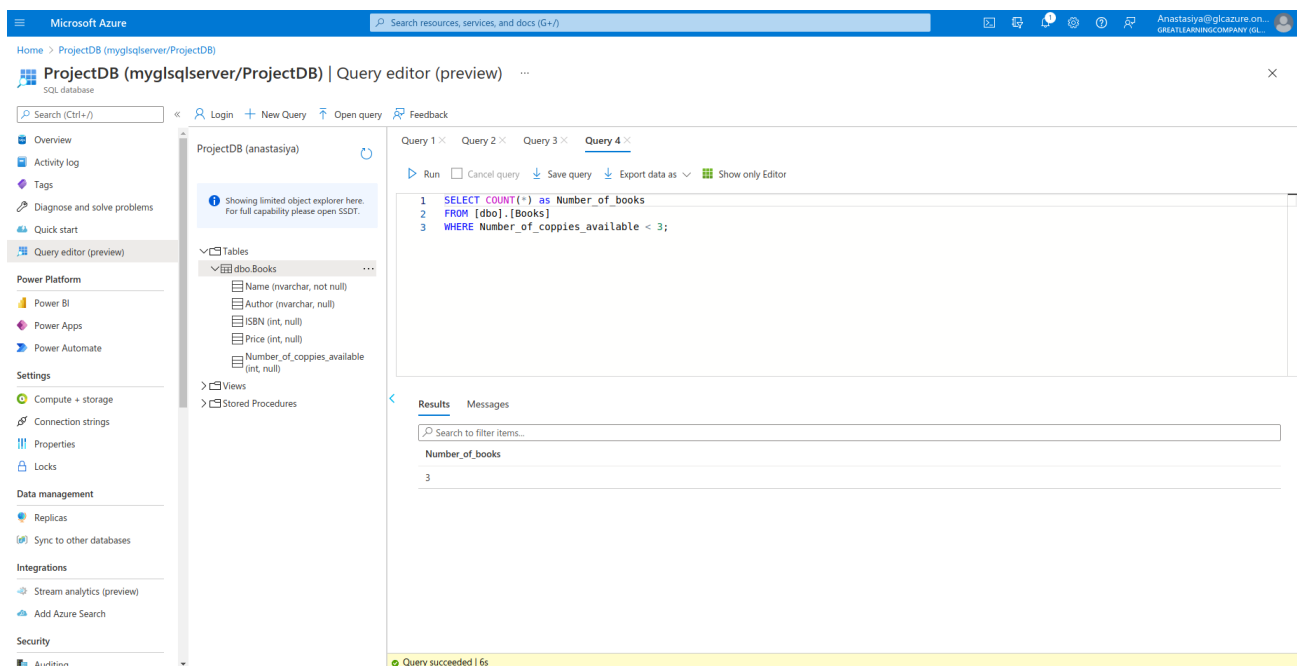
The results pane shows two rows of data:

Name	Author	ISBN	Price	Number_of_copies_available
The Haunting on Hill House	Shirley Jackson	11659042	550	6
At the Mountains of	H.P. Lovecraft	1145873	599	2

The status bar at the bottom indicates 'Query succeeded | 20s'.

According to the data, there is 2 books priced above 500

c) Number of books with less than 3 copies available



The screenshot shows the Microsoft Azure portal interface for the same SQL database. The 'Query editor (preview)' is open, displaying a SQL query that counts the number of books with fewer than 3 copies available. The query is as follows:

```
1 SELECT COUNT(*) as Number_of_books
2 FROM [dbo].[Books]
3 WHERE Number_of_copies_available < 3;
```

The results pane shows a single row of data:

Number_of_books
3

The status bar at the bottom indicates 'Query succeeded | 6s'.

There is 3 books which have less than 3 copies available.