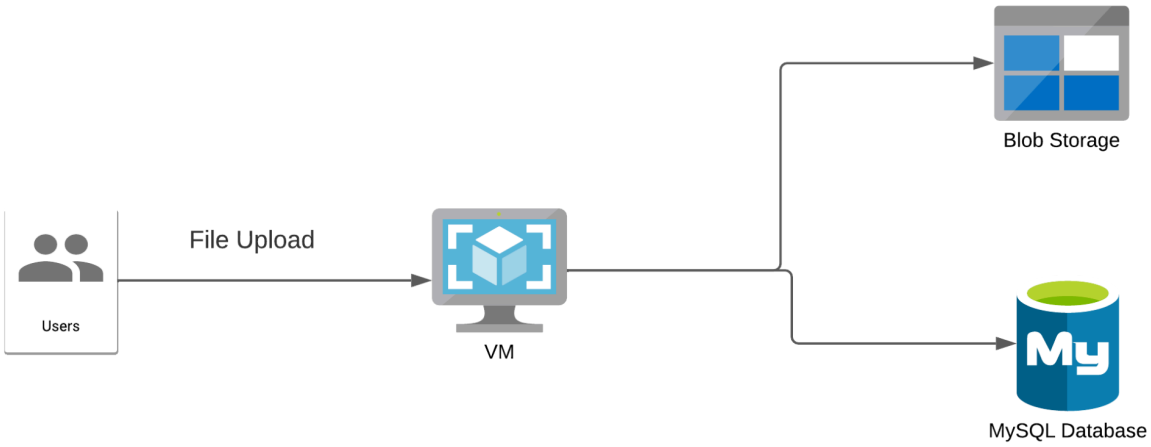
Declaration	
Questions in this exercise are intentionally complex and could be convoluted or confusing. This is by design and to simulate real-life situations where customers seldom give crystal clear requirements and ask unambiguous questions.	
I have read the above statement and agree to these conditions	
I AGREE	Alka Sinha
	<Enter your name above this line to indicate that you are in agreement>

Instructions
Every screenshot requested in this workbook is compulsory and carries 1 marks
Your Azure account ID must be clearly visible in every screenshot using the Azure portal; missing id or using someone else's id is not permitted. Such cases will be considered as plagiarism and severe penalty will be imposed.
All screenshots must be in the order mentioned under "Expected Screenshots" for every step
DO NOT WAIT UNTIL THE LAST MINUTE. The program office will not extend the project submission deadline under any circumstances.
The file should be renamed in the format BATCH_FIRSTNAME_LASTNAME_PROJECT1. For example: PGPCCMAY18_VIJAY_DWIVEDI_PROJECT1.pdf

Resource Clean Up
Cloud is always pay per use model and all resources/services that we consume are chargeable. Cleaning up when you've completed your lab or project is always necessary. This is true whether you're doing a lab or implementing a project at your workplace.
After completing the lab, make sure to delete each resource created in reverse chronological order.

Architecture diagram

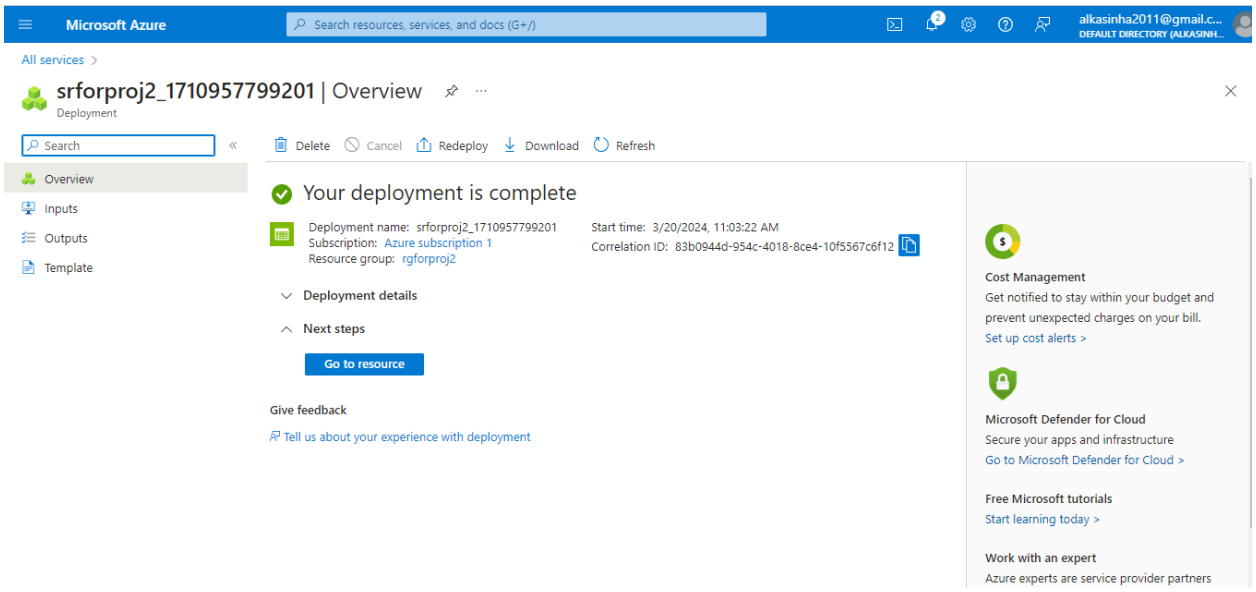


Architecture Implementation	
1	Upload the custom program and provided text file to a VM created using Ubuntu
2	Create a MySQL server using Azure Database service
3	Create a database inside the MySQL server created above
4	Running the custom program will convert the text file into a CSV file, upload it to blob storage and send the data to the MySQL server.

Step 1: Creation of resources

Step number	a
Step name	Creation of Resource group and blob storage
Instructions	1) Create a resource group using any region. Use the same resource group for all resources created in this exercise. 2) Navigate to Storage Accounts and Click on Create. 3) Enter a name and region for the Storage Account. The rest of the fields can be left to their default values. 4) Once the storage account has been created, navigate to the resource. 5) Using the menu on the left, navigate to Access Keys and note down the Connection String value for key 1. You may have to click on the Show keys button at the top of the screen to make the values visible.
Expected screenshots	1) Screen showing created storage account

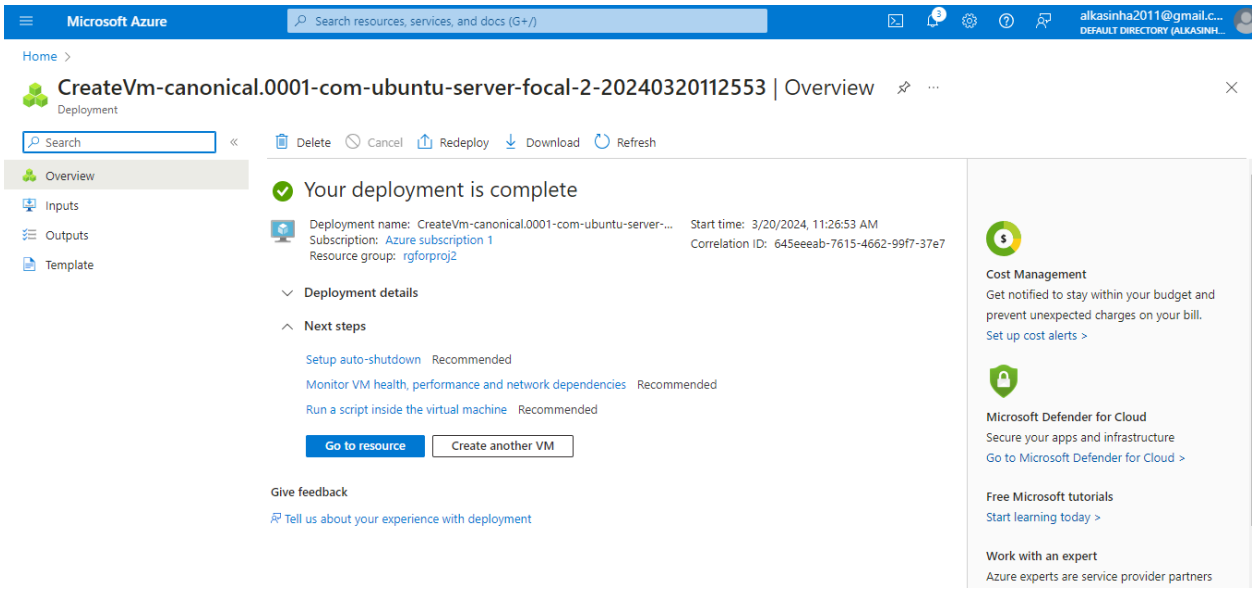
Created storage account screenshot



Step number	b
Step name	Creation of VM

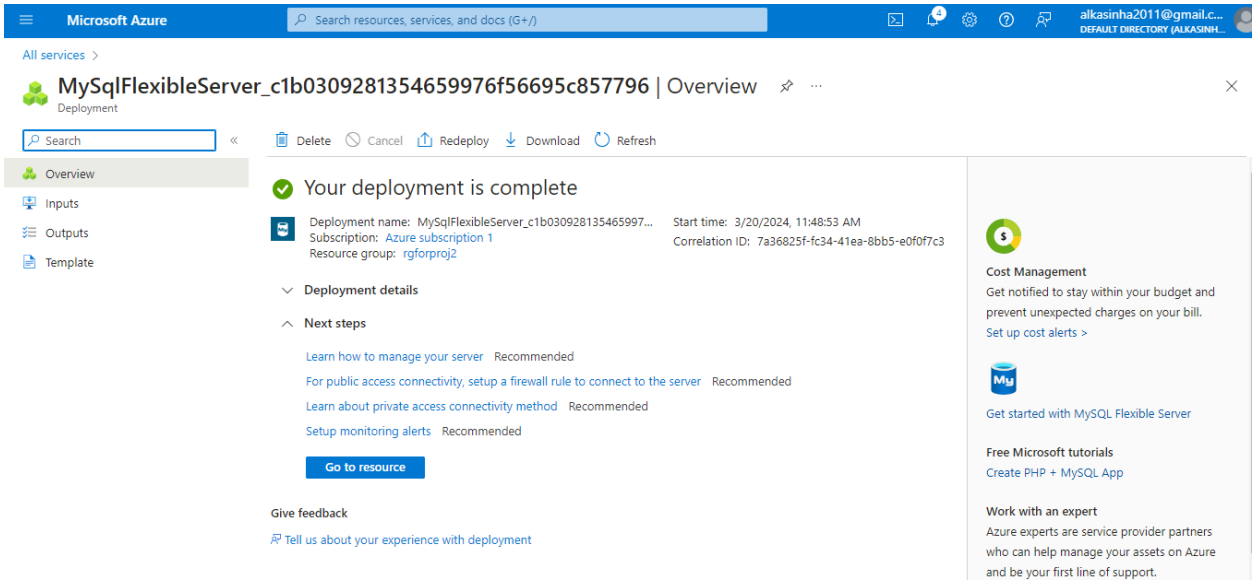
Instructions	1) Navigate to Virtual Machines 2) Create a VM using the Ubuntu 20.04 image. 3) Make sure that port 22 is enabled in inbound ports for the VM during creation. 4) Authentication type needs to be SSH public key. Make sure you note down the value you enter in the Username field. 5) The rest of the fields can be left to their default values. Click on Create.
Expected screenshots	1) Created VM

VM screenshot



Step number	c
Step name	Creation of MySQL server
Instructions	1) Navigate to Azure Database for MySQL servers using the search bar at the top of the Azure portal and click on Create 2) Select the Flexible Server option 3) Enter the server name of choice and the username and password. Make sure to note down the username and password you have entered. 4) Under networking, ensure public access is allowed and check the box “Allow public access from any Azure service within Azure to this server” 5) The rest of the fields can be left to their default values. Click on Create. 6) Once the server has been created, navigate to the resource and note down the Server Name field present in the Overview section.
Expected screenshots	1) Overview screen of the created database server.

Database server

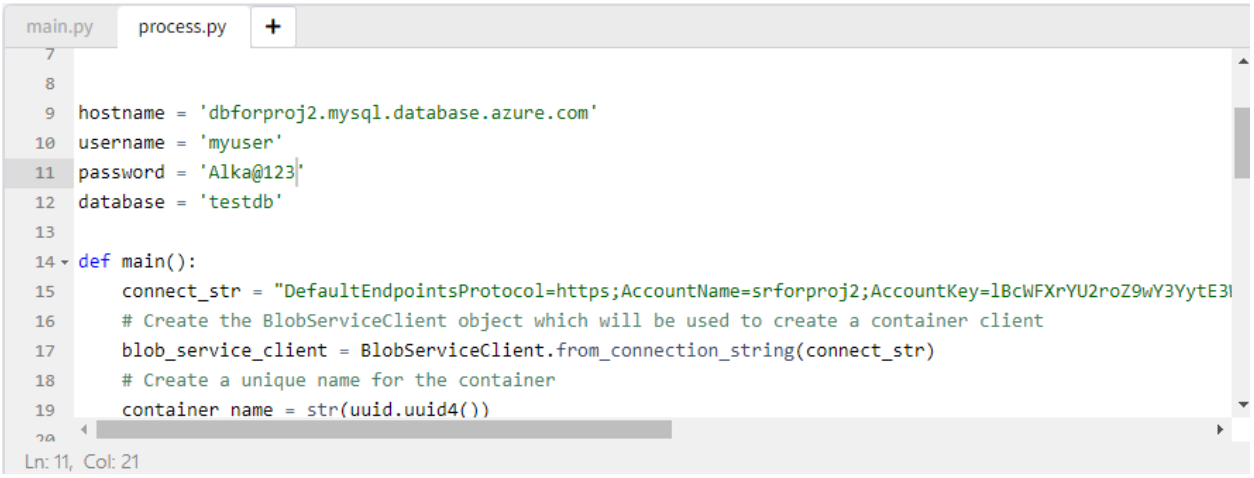


Step 2: Run the custom program in the VM

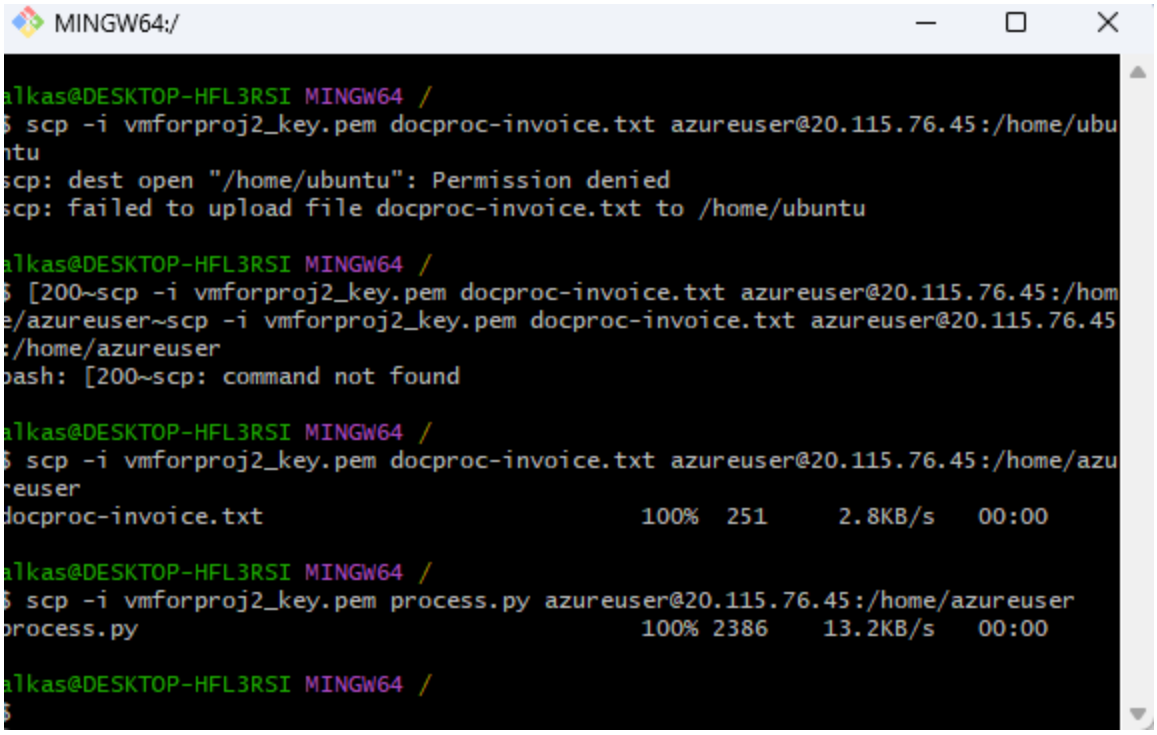
Step number	a
Step name	Environment setup

Instructions	1) Download the invoice file and python script provided with this workbook. 2) Open the Python script using your text editor or code editor of choice 3) Replace the values in lines 9,10,11, and 15 with the database server name, username, password, and storage account connection string(recevied in step 1(a)(5)) respectively. Save the file. 4) Copy both the files to the VM using the scp command. *scp -i <pem file> <file to be copied> <VM username>@<public IP of VM>:/home/ubuntu* You will need to run the scp command twice, once for each file. 5) SSH into the VM using your SSH client of choice and run the below commands to set up the environment *sudo apt install python3* *sudo apt install python3-pip* *sudo pip3 install pandas* *sudo pip3 install azure-storage-blob* *sudo pip3 install mysql-connector-python* *sudo apt install mysql-client-core-8.0*
Expected screenshots	1) Screenshot of the process.py file after completing Step3 above 2) Copying the files using scp 3) Screenshot after completing Step 5 above.

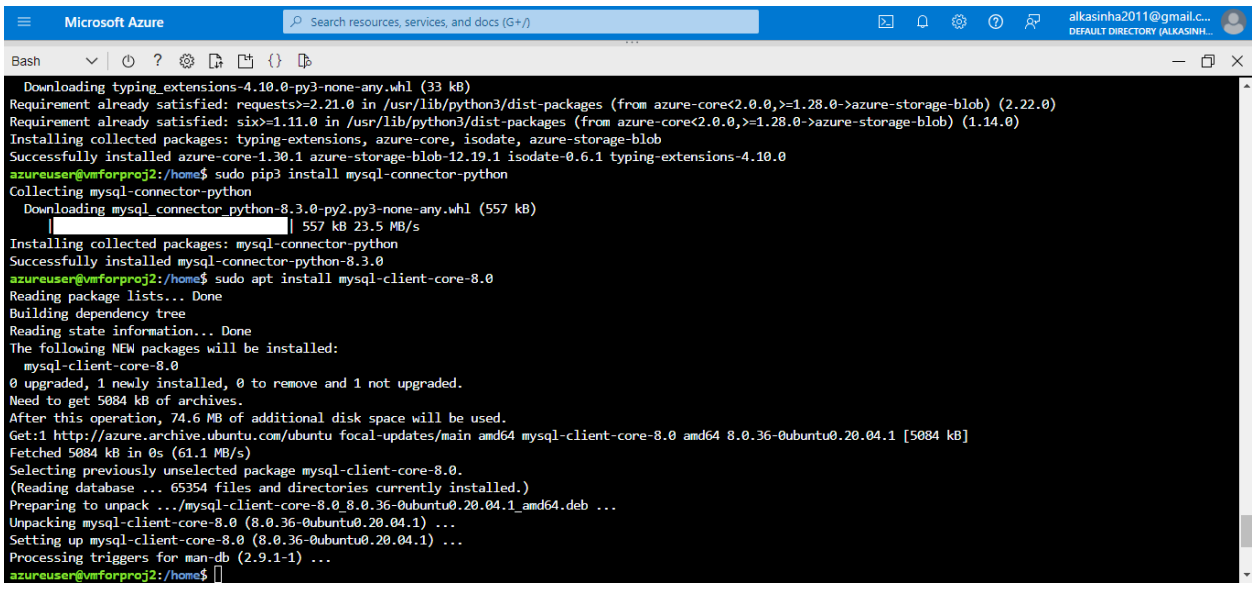
Screenshot of the process.py file after completing Step3 above



Copying files using SCP

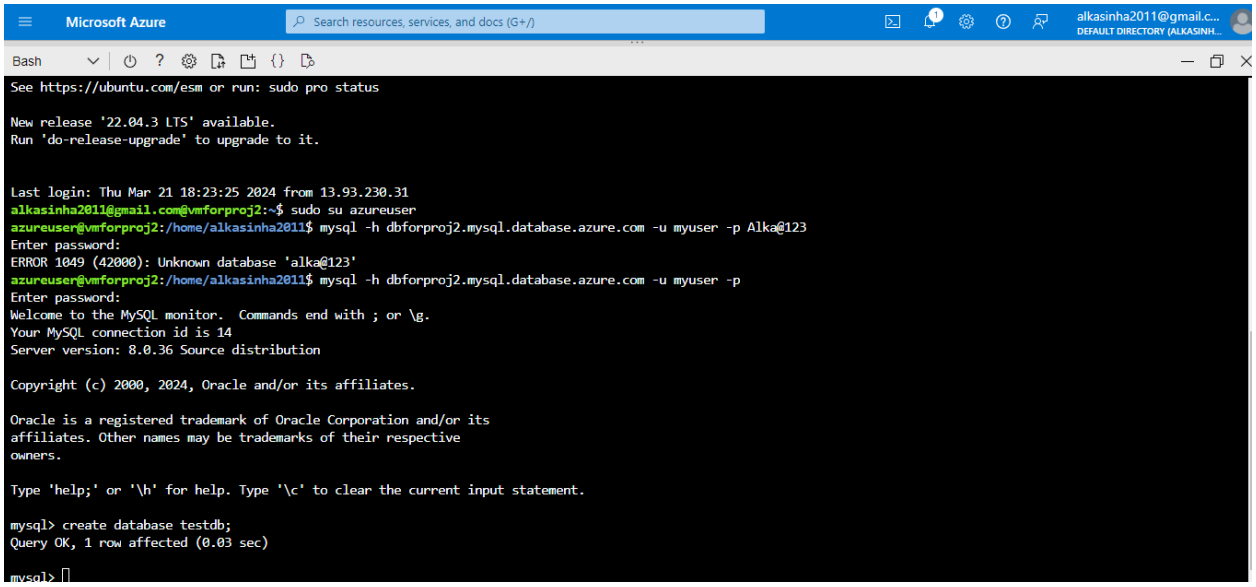


Screenshot of 5th step



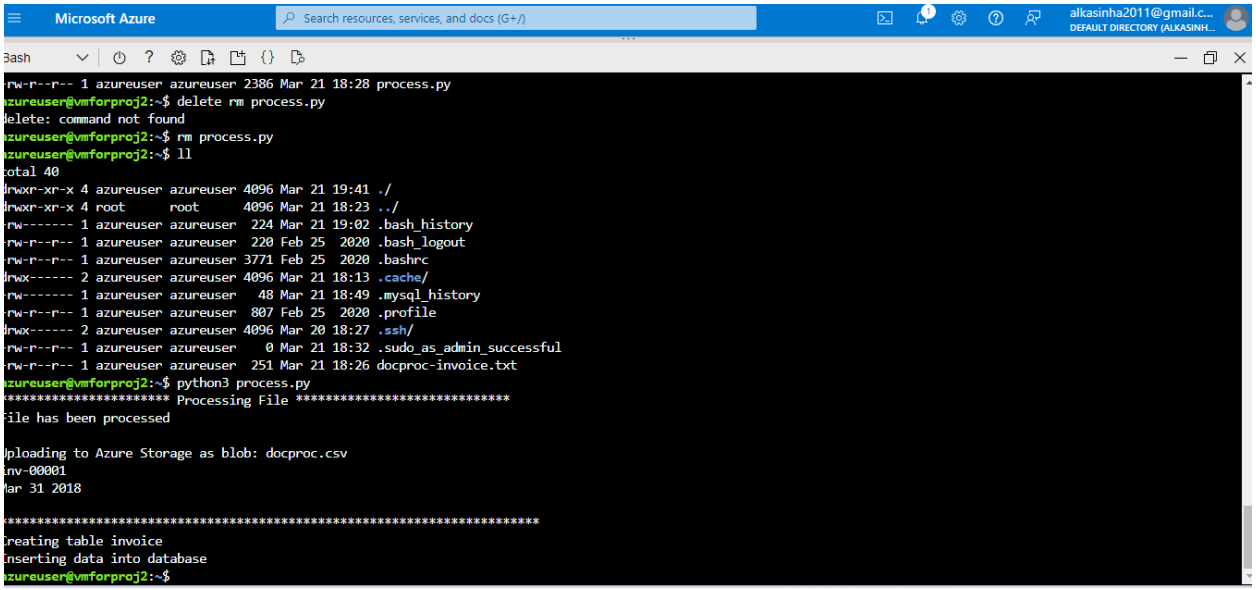
Step number	b
Step name	Configure the database
Instructions	1) Run the following command in the SSH terminal after substituting the database server name and username. *mysql -h <database server name> -u <database_username> -p* *Note : In case of a database server connection error , ensure that the firewall is configured correctly using the below link* https://learn.microsoft.com/en-us/azure/mysql/single-server/how-to-manage-firewall-using-portal 2) Enter the password when prompted. 3) Enter the following command *create database testdb;* 4) Enter *exit* to exit out of the MySQL environment.
Expected screenshots	1) Screenshot after completing Step 3 above

Step 3 screen shot

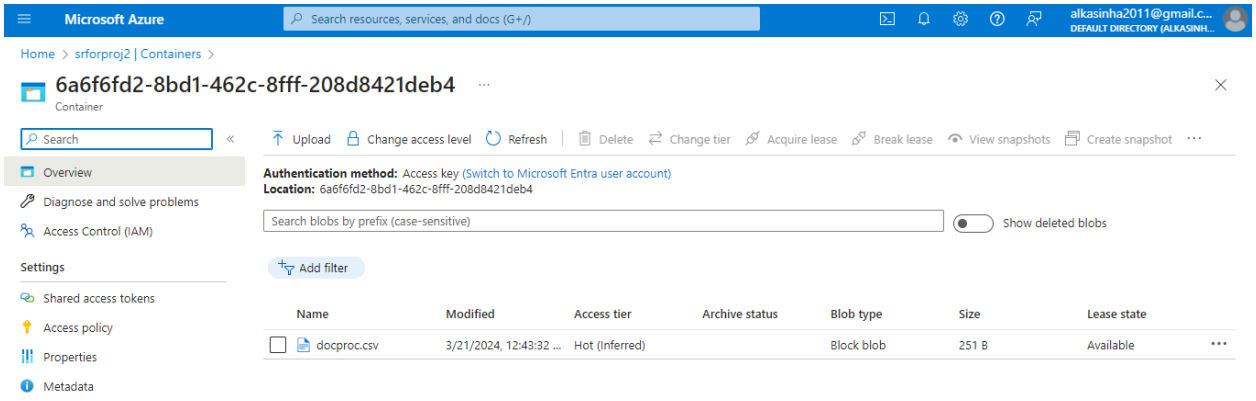

Microsoft Azure
Search resources, services, and docs (G+/)
alkasinha2011@gmail.c...
DEFAULT DIRECTORY (ALKASINH...
Bash
See https://ubuntu.com/esm or run: sudo pro status
New release '22.04.3 LTS' available.
Run 'do-release-upgrade' to upgrade to it.
Last login: Thu Mar 21 18:23:25 2024 from 13.93.230.31
alkasinha2011@gmail.com@vmforproj2:~$ sudo su azureuser
azureuser@vmforproj2:/home/alkasinha2011$ mysql -h dbforproj2.mysql.database.azure.com -u myuser -p Alka@123
Enter password:
ERROR 1049 (42000): Unknown database 'alka@123'
azureuser@vmforproj2:/home/alkasinha2011$ mysql -h dbforproj2.mysql.database.azure.com -u myuser -p
Enter password:
Welcome to the MySQL monitor. Commands end with ; or \g.
Your MySQL connection id is 14
Server version: 8.0.36 Source distribution
Copyright (c) 2000, 2024, Oracle and/or its affiliates.
Oracle is a registered trademark of Oracle Corporation and/or its
affiliates. Other names may be trademarks of their respective
owners.
Type 'help;' or '\h' for help. Type '\c' to clear the current input statement.
mysql> create database testdb;
Query OK, 1 row affected (0.03 sec)
mysql>

Step number	c	
Step name	Running the custom program	
Instructions	1) Run the program using the command *python3 process.py* 2) Navigate to the storage account using the Azure portal. Select the Containers option from the menu on the left and select the created container. Verify that it contains a generated CSV file 3) Run the following command in the SSH terminal after substituting the database server name and username. *mysql -h <database server name> -u <database_username> -p* 4) Enter the password when prompted. 5) Run the following commands to verify that the data has been entered into the database *use testdb;* *select * from invoice;* 6) Enter *exit* to exit out of the MySQL environment.	
Expected screenshots	1) Running the custom Python program	2)Created CSV file in Blob Storage 3) Screenshot after running step 5 above

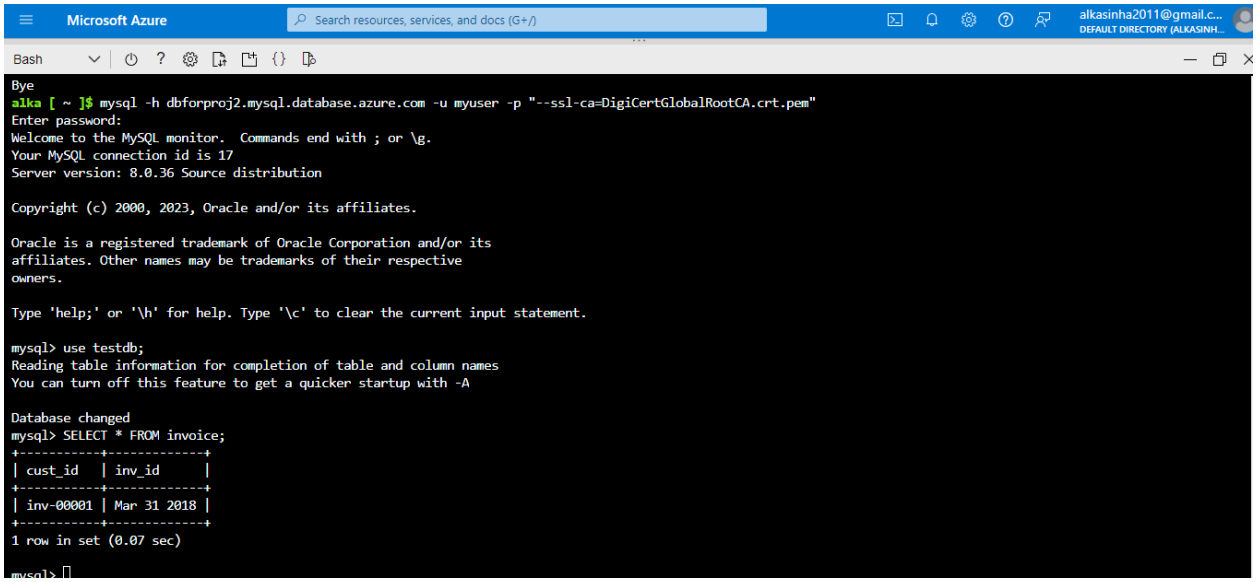
Running the custom python program



Created CSV file



5th step screenshot



Answer the following questions

Q1 At which level are lifecycle management rules for Blob storage applied?

a) File Level

b) Blob Level

c) Storage account level

d) Subscription level

Enter your answer here c

C storage account level

Q2 Which of the following is not true about the Premium performance storage tier in Azure?

a) Only Hot and Cool storage tiers are available

b) Supports only LRS and ZRS

c) Data is stored on SSDs

d) Geo-redundancy is not possible.

Enter your answer here A

A Only Hot and Cool storage tiers are available

Q3 Which of the following Azure SQL deployment options should you use when the number of databases to be created is variable.

a) On-premises deployment of Azure SQL

b) Azure SQL Database

c) Managed DB instance

d) None of these

Enter your answer here b

b) Azure SQL Database

Q4 Which of the following Azure SQL purchasing models would be more beneficial for BYOL (Bring-Your-Own-License) use-cases?

a) Depends on the license type

b) Does not matter

c) vCore based

d) DTU based

Enter your answer here A

a) Depends on the license type

Q5 Why was port 3306 not enabled for incoming connections in the VM in this exercise?

a) The port is only required to be enabled on the database server

b) Azure MySQL uses a different port

c) Port 3306 has no bearing on this exercise.

d) None of these

Enter your answer here A

a) The port is only required to be enabled on the database server

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Grades distribution	
MCQs	10 (2 mark each)
Implementation screenshots	10 marks (1 marks each)
Total	20 marks