



Data Technician

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Day 1: Task 1

Please research and complete the below questions relating to key concepts of cloud.

Be prepared to discuss the below in the group following this task.

What can cloud computing do for us in the real-world?	<p>Cloud computing allows individuals and businesses to access and store data remotely on servers. It can enable them to share files, disaster recovery and running applications without needing to install the software locally.</p>
How can it benefit a business?	<p>Cloud computing benefit a business by providing through:</p> <ul style="list-style-type: none">-Reduced hardware needs.-Increased scalability to adapt to changing demands.- Improving flexibility in increasing data and applications form.-Enhance collaboration capabilities.-Faster time to market for new products and services.
What's the alternative to cloud computing?	<p>The alternative to cloud computing is on-premise hosting where a company maintain its own physical servers and infrastructure within its own facilities in</p>



What cloud providers can we use, what are their features and functions?

order to give them control over their data and hardware.

There are different cloud providers such as:

-Amazon Web Service (AWS):

Widely considered the market leader, providing a vast array of services including EC2(virtual servers), S3(object storage), RDS (relational database), lambda (serverless computing) and extensive machine learning tools.

-Microsoft Azure:

Well integrated with Microsoft products, strong for hybrid cloud solutions, with features like virtual machines, azure SQL database and azure active directory.

-Google Cloud Platform:

Known for its robust data analytics capabilities, including Big Query as well as strong container orchestration with Kubernetes engine.

-IBM Cloud:

Offers a range of services with a focus on enterprise solutions, including blockchain, AI and security features often used for hybrid cloud deployments.

-Alibaba Cloud:

Primarily popular in Asia providing comprehensive cloud services for data management, elastic computing, storage, networking and application development.

-Oracle Cloud:

Integrated with Oracle database and applications, suitable for organizations already heavily invested in Oracle technology.



-DigitalOcean:

A user-friendly platform often preferred for smaller projects, offering simple virtual machines, cloud storage and managed database.

Each of them offers a comprehensive suite of services like compute power, storage, networking, databases, analytics.



Day 1: Task 2

Please research the below cloud offerings, explain what they are and examples of use cases.

Cloud Offerings	Explain what it is	When / how might you use this service in the real-world?
IaaS (Infrastructure as a service)	A cloud computing Service that provides on-demand access to compute, storage and networking resources. Allows users to pay for resources on pay-as-you-go basis.	When a user wants to add more storage during peak usage. IaaS can help a business to adapt to fluctuating workloads and grow their business.
PaaS (Platform as a service)	PaaS is a cloud computing model that allows users to rent software tools and hardware to develop applications.	A developer often use a PaaS to build, run and compile program or developing, deploying web applications without worrying about the underlying infrastructure.



SaaS (Software as a service)	SaaS allows users to connect to and use cloud-based apps over the internet.	When the user needs to access an application or program online without having to install it on the computer such as accessing to the emails online without having to install the app or sharing a word document online using google docs.
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Day 1: Task 3

Please research the below terms and explain what they are, when they would be appropriate and a real-world example of where it could be implemented (i.e. what type of organisation).

Public Cloud

A public cloud is a cloud computing model that provides computing resources over the internet. These resources are owned and operated by a third-party provider and can be accessed by multiple users. However, due to the shared infrastructure public cloud may not be suitable for storing highly sensitive data.

A public cloud is most appropriate for situations where a company needs rapid scalability, flexible resource collaboration and cost effective computing power without significant upfront investment such as the companies that develop web applications or a data analysis who wants to process a large dataset with high computational power without hardware costs.

Another example of public cloud is email hosting where a business can use it to host their company email without managing their own email servers.

Private Cloud

A private cloud is a cloud computing environment that is exclusively used by a single organization, it is also known as a corporate or internal cloud.

A private cloud can be hosted on-site at an organization's data centre or by a third-party service provider, the hardware and software are dedicated to the organization and the services, and the infrastructure are maintained on a private network which provides a high level of security and compliance.

Also, a private cloud is suitable for sensitive data like



	<p>businesses with high privacy such as health care (NHS), government and banks which must deal with a highly confidential information.</p>
Hybrid Cloud	<p>A hybrid cloud is a computing environment that combines public and private clouds to run applications and store data. It allows organizations to share data and applications between the different environments. In another word a hybrid cloud allows data and apps to move between the two environments. Many companies and organizations choose a hybrid cloud approach due to business imperatives such as meeting regulatory and data sovereignty requirements as an example of businesses that utilise a hybrid cloud strategy like Netflix, Coca-Cola and Toyota.</p>
Community Cloud	<p>A community cloud is a cloud computing environment that multiple organisations share, it is collaborative effort where organisations with similar goals, security needs or regulatory requirements . A community cloud allows companies to create branded online portals where users can interact, share information and collaborate within a dedicated community space. As a community cloud is primarily a salesforce product, most companies utilise it are already a salesforce user. The companies such as Cisco, Philips, virgin America airline.</p>



Day 2: Task 1

Describe, with examples, the **three** major areas that the Computer Misuse Act deals with.

Area	Description	Example
Unauthorized access	Accessing a computer system or data without permission.	Someone logging into a company's computer system using a stolen password.
Unauthorized access with intent	Accessing a computer system with the intention of committing a crime.	A hacker gaining access to company's financial database by exploiting a software vulnerability with the clear intention of stealing sensitive information like credit card details.
Unauthorized acts	Intentionally or recklessly impairing the operation of a computer system.	Accessing someone's personal online account without their permission like logging into their social media or email accounts.

The computer misuse act 1990 is an act where an individual can be criminalised because of computer related offense. Describe three extra powers that the Police and Justice Act 2006 (Computer Misuse) has added.



Description
<p>(1) A person is guilty of an offence if</p> <ul style="list-style-type: none"> (a) He does any unauthorised act in relation to a computer; (b) At the time when he does the act, he knows that it is unauthorised; (c) Either subsection (2) or subsection (3) below applies.
<p>(2) This subsection applies if the person intends by doing the act</p> <ul style="list-style-type: none"> (a) to impair the operation of any computer; (b) to prevent or hinder access to any program or data held in any computer; (c) to impair the operation of any such program or the reliability of any such Data; (d) To enable any of the things mentioned in paragraph (a) to (c) above to be done.
<p>(3) This subsection applies if the person is reckless as to whether the act will do any of the things mentioned in paragraph (a) to (d) to (c) of subsection (2) above.</p>

Look at the below website to answer the questions:
<https://www.gov.uk/personal-data-my-employer-can-keep-about-me>

Write down three items of data which a company can store about an employee.
Name
Address
Date of birth



Give three more examples of data that an employer can only store if they first get the employee's permission.

Genetic information

Detailed medical history

Biometrics(fingerprints)

Conduct further research to answer the below questions.

Question	Answer
Provide one example of: Copyright infringement	Copyright infringement occurs when someone uses copyrighted material without the copyright holder's permission. For example Music when using it without the composer or label's permission.
Provide one example of: Plagiarism	Plagiarism is using someone else's words or ideas without giving them credit. For example, when writing a scientific articles or a thesis you can't copy the words of other publishers or writer without citing their names or websites in the reference page.



<p>What are two consequences of copyright infringement and software piracy?</p>	<p>The two consequences of copyright infringement and software piracy are:</p> <p>Fines: copyright infringement can result in fines, which can be substantial.</p> <p>Imprisonment: copyright infringement can result in imprisonment, which can be up to several years.</p>
<p>Give three possible consequences for individuals when using pirated software</p>	<p>Using pirated software can lead to several negative consequences for individuals. Here are three possible outcomes.</p> <ul style="list-style-type: none"> 1- Legal Penalties and Fines: Many countries have strict laws against software piracy and using pirated software can result in legal action. 2- Security Risks and Malware infections: pirated software often comes from unverified or malicious sources, which increases the risk of downloading malware, viruses or other harmful software. These threats can compromise personal data, steal sensitive information or even allow hackers to take control of the user's device. 3- Lack of Customer Support and Updates: legitimate software usually comes with customer support, regular updates and patches to fix bugs or vulnerabilities.



Listed below are some laws which we have covered today:

1. Computer Misuse Act 1990
2. Police and Justice Act 2006 (Computer Misuse)
3. Copyright, Designs and Patents Act 1988
4. Copyright (Computer Programs) Regulations 1992
5. The Health and Safety (Display Screen Equipment) Regulations 1992
6. Data Protection Act 2018
7. Consumer Rights Act 2015

- Insert a number in the first column of each row to match each of the statements with one of the above Acts.
- One of statements is incorrect and not illegal. For this statement, write 'Not illegal'.



Act number	Clause
Not illegal	With some exceptions, it is illegal to use unlicensed software
7	Any product, digital or otherwise, must be fit for the purpose it is supplied for
1	Unauthorised modification of computer material is illegal
1	It is illegal to create or use a hacking tool for penetration testing
6	Personal data may only be used for specified, explicit purposes
5	Employers must provide their computer users with adequate health and safety training for any workstation they work at
1	It is illegal to distribute hacking tools for criminal purposes
3	It is illegal to distribute an illicit recording
7	Personal data may not be kept longer than necessary
1	Gaining unauthorised access to a computer system is illegal
5	Employers must ensure that employees take regular and adequate breaks from looking at their screens
1	It is illegal to prevent or hinder access (e.g. by a denial-of-service attack) to any program or data held in any computer
6	Personal data must be accurate and where necessary kept up to date



Day 3: Task 1

Please complete the below lab (3) '*Explore relational data in Azure*' and paste evidence of the completed lab in the box provided.

The screenshot shows the landing page for the 'Explore relational data in Azure' lab. It includes a summary table with the following details:

Duration:	2 Hours, 15 Minutes
Lab Series:	DP-900T00-A Microsoft Azure Data Fundamentals [Cloud Slice Provided]
Virtualization Platform:	Hyper-V
RAM:	6.5GB
Cloud Platform:	Azure
Content Version:	2
Is Exam:	No
Status:	Not Running

Below the table is a large 'Launch' button.

The screenshot shows the Microsoft Azure Query editor (preview) interface. On the left, there's a sidebar with various database management options like Overview, Activity log, Tags, and Query editor (preview). The main area displays a query window titled 'Query 1' containing the following SQL code:

```
1 SELECT * FROM SalesLT.Product;
```

The results pane shows a table with three columns: ProductID, Name, and Product. The data is as follows:

ProductID	Name	Product
680	HL Road Frame - Black, 58	FR-R92I
706	HL Road Frame - Red, 58	FR-R92I

A message at the bottom of the results pane says 'Query succeeded | 0s'.

Completed lab is written vertically on the left side of the screenshot.



The screenshot shows the Microsoft Azure SQL Database Query editor (preview) interface. The top navigation bar includes 'Home', 'Microsoft.SQLDatabase.newDatabaseNewServer_077193794c08438381e26 | Overview', 'AdventureWorks (sqlserver47816982/AdventureWorks)', and a 'Query editor (preview)' tab.

The left sidebar contains a 'Query editor (preview)' section with various options like 'Overview', 'Activity log', 'Tags', 'Diagnose and solve problems', and 'Query editor (preview)'. Below this, there's a list of database objects under 'Tables' and 'Views'.

Two queries are running in the main area:

Query 1:

```
1 SELECT ProductID, Name, ListPrice, ProductCategoryID
2 FROM SalesLT.Product;
```

Query 2:

```
1 SELECT p.ProductID, p.Name AS ProductName,
2      c.Name AS Category, p.ListPrice
3 FROM SalesLT.Product AS p
4 JOIN [SalesLT].[ProductCategory] AS c
5 ON p.ProductCategoryID = c.ProductCategoryID;
```

The results for both queries are displayed in tables:

Query 1 Results:

ProductID	Name	ListPrice
680	HL Road Frame - Bla...	1431.5000
706	HL Road Frame - Re...	1431.5000
707	Scoot-100 Helmet - R...	24.0000

Query 2 Results:

ProductID	ProductName	Category
771	Mountain-100 Silver...	Mountain Bikes
772	Mountain-100 Silver...	Mountain Bikes
773	Mountain-100 Silver...	Mountain Bikes

A message at the bottom of the screen asks, "Are you sure you want to end this lab?" with 'Yes, end my lab!' and 'No, not yet.' buttons.



Day 3: Task 2

Please complete the below lab (4) '*Explore non-relational data in Azure*' and paste evidence of the completed lab in the box provided.

Explore non-relational data in Azure

Learning Path 03 (CSS)

Duration:	2 Hours, 15 Minutes
Lab Series:	DP-900T00-A Microsoft Azure Data Fundamentals [Cloud Slice Provided]
Virtualization Platform:	Hyper-V
RAM:	6.5GB
Cloud Platform:	Azure
Content Version:	2
Is Exam:	No
Status:	Not Running

Launch

Screenshots exploring Cosmos DB

Complet
ed lab

The screenshot shows the Microsoft Azure portal with a storage account named 'yraccount25'. A modal window titled 'yraccount25 | Data Lake Gen2 upgrade' is open, showing the progress of the upgrade. Step 1: Review account changes before upgrading - Completed. Step 2: Validate account before upgrading - In progress. Step 3: Upgrade account - Not started. Validation in progress (0% complete). A 'Cancel validation' button is present. To the right, a separate window titled 'Explore non-relational data in Azure' is visible, showing a checklist for upgrading to Azure Data Lake Storage Gen2. The checklist includes:

- 1. Download the [product2.json](https://aka.ms/product2.json) JSON file from <https://aka.ms/product2.json> and save it on your computer in the same folder where you downloaded [product1.json](#) previously - you'll upload it to blob storage later.
- 2. In the Azure portal page for your storage account, on the left side, scroll down to the **Settings** section, and select **Data Lake Gen2 upgrade**.
- 3. In the **Data Lake Gen2 upgrade** page, expand and complete each step to upgrade your storage account to enable hierarchical namespace and support Azure Data Lake Storage Gen 2. This may take some time.
- 4. When the upgrade is complete, in the pane on the left side, in the top section, select **Storage browser** and navigate back to the root of your **data blob container**, which still contains the **product_data** folder.
- 5. Select the **product_data** folder, and verify it still contains the **product1.json** file you uploaded previously.
- 6. Use the **Upload** button to open the **Upload blob** panel.
- 7. In the **Upload blob** panel, select the



data Container Overview

Authentication method: Access key (Switch to Microsoft Entra user account)
Location: data / products

Name	Modified	Text	Access tier
[-]			
product1.json	1/29/2025, 4:59:07 AM	Hot (Inferred)	
product2.json	1/29/2025, 5:09:44 AM	Hot (Inferred)	

Containers

Last modified 1/29/2025, 4:54:20 AM **Anonymous access** ... **Lease state** Private

- Container properties
- Generate SAS
- Manage ACL
- Access policy
- Acquire lease
- Break lease
- Change access level
- Edit metadata
- Delete

files SMB File share Overview

Storage account: yraccount25 **Resource group:** ResourceGroup1 **Location:** East US **Subscription (move):** MOC Subscription-ld50120552 **Subscription ID:** f5805156-4d2c-41c0-83c6-fd74b1bd37f8 **Share URL:** https://yraccount25.file.core.windows.net/files **Redundancy:** Locally-redundant storage (LRS) **Configuration mode:** 1/29/2025, 5:15:28 AM

Properties **Capabilities (2)** **Tutorials**

Size Maximum storage (GiB) 102400 **Feature status** Soft delete ⚡ Wednesday, January 29, 2025

account to enable hierarchical namespace and support Azure Data Lake Storage Gen 2. This may take some time.

- When the upgrade is complete, in the pane on the left side, in the top section, select **Storage browser** and navigate back to the root of your **data blob container**, which still contains the **product_data** folder.
- Select the **product_data** folder, and verify it still contains the **product1.json** file you uploaded previously.
- Use the **Upload** button to open the **Upload blob** panel.
- In the **Upload blob** panel, select the **product2.json** file you saved on your local computer. Then select the **Upload** button.
- Close the **Upload blob** panel if it's still open, and verify that a **product_data** folder now contains the **product2.json** file.
- On the left side, in the **Data storage** section, select **Containers**.
- Open the **data** container, and verify that the **product_data** folder you created is listed.
- Select the **...** icon at the right-end of the folder, and note that with hierarchical namespace enabled, you can perform configuration tasks at the folder-level; including renaming folders and setting permissions.
- Use the **X** icon at the top right in the **data** page to close the page and return to the **Containers** page.

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- Use the **X** icon at the top right in the **data** page to close the page and return to the **Containers** page.

Explore Azure Files

Azure Files provides a way to create cloud-based file shares.

- In the Azure portal page for your storage container, on the left side, in the **Data storage** section, select **File shares**.
- In the File shares page, select **+ File share** and add a new file share named **files** using the **Transaction optimized** tier. Click the **Backup tab** under the **New file share** blade and ensure **Enable backup** is disabled. Then click **Review + create**.
- Select **Next: Backup >** and disable backup. Then select **Review + create**.
- In the **File shares**, open your new **files** share.
- At the top of the page, select **Connect**. Then in the **Connect** pane, note that there are tabs for common operating systems (Windows, Linux, and macOS) that contain scripts you can run to connect to the shared folder from a client computer.
- Close the **Connect** pane and then close the **files** page to return to the **File shares** page for your Azure storage account.

data Container

Search: Upload Add Directory Refresh Rename Delete

Authentication method: Access key (Switch to Microsoft Entra user account)

Location: data / products

Search blobs by prefix (case-sensitive):

Show deleted objects:

Name	Modified	Access tier
[...]		
product1.json	1/29/2025, 4:59:07 AM	Hot (Inferred)
product2.json	1/29/2025, 5:09:44 AM	Hot (Inferred)

Remote Audio: 100%

- Complete each step to upgrade your storage account to enable hierarchical namespace and support Azure Data Lake Storage Gen 2. This may take some time.
4. When the upgrade is complete, in the pane on the left side, in the top section, select **Storage browser** and navigate back to the root of your **data** blob container, which still contains the **product_data** folder.
 5. Select the **product_data** folder, and verify it still contains the **product1.json** file you uploaded previously.
 6. Use the **Upload** button to open the **Upload blob** panel.
 7. In the **Upload blob** panel, select the **product2.json** file you saved on your local computer. Then select the **Upload** button.
 8. Close the **Upload blob** panel if it's still open, and verify that a **product_data** folder now contains the **product2.json** file.
 9. On the left side, in the **Data storage** section, select **Containers**.
 10. Open the **data** container, and verify that the **product_data** folder you created is listed.
 11. Select the **...** icon at the right-end of the folder, and note that with hierarchical namespace enabled, you can perform configuration tasks at the folder-level; including renaming folders and setting permissions.
 12. Use the **X** icon at the top right in the **data** page to close the page and return to the **Containers** page.

All services > yraccount25_1738155102642 | Overview > yraccount25

yraccount25 | Containers

Storage account

Search: Container Change access level Restore containers

Search containers by prefix:

Show deleted containers:

Last modified: 1/29/2025, 4:54:20 AM Private

Container properties

- Generate SAS
- Manage ACL
- Access policy
- Acquire lease
- Break lease
- Change access level
- Edit metadata
- Delete

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 12. Use the **X** icon at the top right in the **data** page to close the page and return to the **Containers** page.

All services > yraccount25_1738155102642 | Overview > yraccount25 | File shares >

files SMB File share

Search: Connect Upload Refresh Add directory

Enable Backup for file share "files" to protect your data. [Learn more](#)

Storage account: yraccount25

Resource group (...): Resourcegroup1

Location: East US

Subscription (move): MOC Subscription-Id50120552

Subscription ID: f5805156-4d2c-41c0-83c6-fd74b1bd37f8

Share URL: https://yraccount25.file.core.windows.net/files

Redundancy: Locally-redundant storage (LRS)

Configuration mod...: 1/29/2025, 5:15:28 AM

Properties Capabilities (2) Tutorials

Size: Maximum storage (GiB) 102400 Feature status: Soft delete ⚡ Wednesday, January 29, 2025

note that with hierarchical namespace enabled, you can perform configuration tasks at the folder-level; including renaming folders and setting permissions.

12. Use the **X** icon at the top right in the **data** page to close the page and return to the **Containers** page.
- ### Explore Azure Files
- Azure Files provides a way to create cloud-based file shares.
1. In the Azure portal page for your storage container, on the left side, in the **Data storage** section, select **File shares**.
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 3. Select **Next: Backup** and disable backup. Then select **Review + create**.
 4. In the **File shares**, open your new **files** share.
 5. At the top of the page, select **Connect**. Then in the **Connect** pane, note that there are tabs for common operating systems (Windows, Linux, and macOS) that contain scripts you can run to connect to the shared folder from a client computer.
 6. Close the **Connect** pane and then close the **files** page to return to the **File shares** page for your Azure storage account.



Storage browser

Authentication method: Access key (Switch to Microsoft Entra user account)

Showing all 1 items

Name	Url
products	https://yraccount25.table.core.windows.net/products

- 5. At the top of the page, in the **Connect** pane, note that there are tabs for common operating systems (Windows, Linux, and macOS) that contain scripts you can run to connect to the shared folder from a client computer.
- 6. Close the **Connect** pane and then close the **File shares** page to return to the **File** Azure storage account.

Explore Azure Tables

Azure Tables provide a key/value store for applications that need to store data values, but don't need the full functionality and structure of a relational database.

1. In the Azure portal page for your storage container, on the left side, in the **Data storage** section, select **Tables**.
2. On the **Tables** page, select **+ Table** and create a new table named **products**.
3. After the **products** table has been created, in the **Storage browser** pane on the left side, in the top section, select **Tables**.
4. In storage explorer, select **Tables** and verify that the **products** table is listed.
5. Select the **products** table.
6. In the **product** page, select **+ Add entity**.
7. In the **Add entity** panel, enter the following key values:

o PartitionKey: 1

Storage browser

Authentication method: Access key (Switch to Microsoft Entra user account)

Showing all 1 items

Name	Url
products	https://yraccount25.table.core.windows.net/products

- 5. At the top of the page, select **CONNECT**. Then in the **Connect** pane, note that there are tabs for common operating systems (Windows, Linux, and macOS) that contain scripts you can run to connect to the shared folder from a client computer.
- 6. Close the **Connect** pane and then close the **File shares** page to return to the **File** Azure storage account.

Explore Azure Tables

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5. Select the **products** table.
6. In the **product** page, select **+ Add entity**.
7. In the **Add entity** panel, enter the following key values:

o PartitionKey: 1

Storage browser

Authentication method: Access key (Switch to Microsoft Entra user account)

Showing all 1 items

PartitionKey	RowKey	Timestamp
1	1	2025-01-2

4. In storage explorer, select **Tables** and verify that the **products** table is listed.
5. Select the **products** table.
6. In the **product** page, select **+ Add entity**.
7. In the **Add entity** panel, enter the following key values:

Property name	Type	Value
Name	String	Widget
8. Select **Add property**, and create a new property with the following values:

Property name	Type	Value
Price	Double	2.99
9. Add a second property with the following values:

Property name	Type	Value
10. Select **Insert** to insert a row for the new entity into the table.
11. In storage browser, verify that a row has been added to the **products** table, and that a **Timestamp** column has been created to indicate when the row was last modified.
12. Add another entity to the **products** table with the



Microsoft Azure | Storage browser

All services > yraccount25_1738155102642 | Overview > yraccount25

Storage account

Storage browser

Storage Mover

Partner solutions

Data storage

- Containers
- File shares
- Queues
- Tables

Security + networking

Data management

Settings

- Configuration
- Data Lake Gen2 upgrade

Resource sharing (CORS)

Search Events

Add entity Refresh Delete Edit columns

Tables products

Authentication method: Access key (Switch to Microsoft Entra user account)

Add filter Advanced filters

Showing all 2 items

propertyname	Price	Discontinu
2.99		
	1.99	true

Microsoft Azure | Storage browser

All services > yraccount25_1738155102642 | Overview > yraccount25

Storage account

Storage browser

Storage Mover

Partner solutions

Data storage

- Containers
- File shares
- Queues
- Tables

Security + networking

Data management

Settings

- Configuration
- Data Lake Gen2 upgrade

Resource sharing (CORS)

Search Events

Add entity Refresh Delete Edit columns

Tables products

Authentication method: Access key (Switch to Microsoft Entra user account)

Add filter Advanced filters

Showing all 2 items

propertyname	Price	Discontinu
2.99		
	1.99	true

Microsoft Azure | Storage browser

All services > yraccount25_1738155102642 | Overview > yraccount25

Storage account

Storage browser

Storage Mover

Partner solutions

Data storage

- Containers
- File shares
- Queues
- Tables

Security + networking

Data management

Settings

- Configuration
- Data Lake Gen2 upgrade

Resource sharing (CORS)

Search Events

Add entity Refresh Delete Edit columns

Tables products

Authentication method: Access key (Switch to Microsoft Entra user account)

Add filter Advanced filters

Showing all 2 items

propertyname	Price	Discontinu
2.99		
	1.99	true

9. Add a second property with the following values:

Property name	Type	Value
Price	Double	2.99

10. Select Insert to insert a row for the new entity in the table.

11. In storage browser, verify that a row has been added to the products table, and that a Timestamp column has been created to indicate when the row was last modified.

12. Add another entity to the products table with the following properties:

Property name	Type	Value
PartitionKey	String	1
RowKey	String	2
Name	String	Kniknak
Price	Double	1.99
Discontinued	Boolean	true

13. After inserting the new entity, verify that a row containing the discontinued product is shown in

Select items to see a list of items in the container. The items represent product data, each with a unique id and other properties.

2. Select any of the items in the list to see a JSON representation of the item data.

3. At the top of the page, select New Item to create a new blank item.

4. Modify the JSON for the new item as follows, and then select Save.

```
json
T {
  "name": "Road Helmet,45",
  "id": "123456789",
  "categoryID": "123456789",
  "SKU": "AB-1234-56",
  "description": "The product cal",
  "price": 48.74
}
```

5. After saving the new item, notice that additional metadata properties are added automatically.



The screenshot shows the Microsoft Azure Data Explorer interface. On the left, the navigation pane includes Home, SampleDB, SampleContainer, Items, Scale & Settings, Stored Procedures, User Defined Functions, Triggers, and Conflicts. The main area displays a query editor with the following SQL code:

```

SELECT * FROM c

```

Type a query predicate (e.g., WHERE) Apply Filter

Results pane showing a list of items from the Sample_Container table:

id	name	categoryName	sku	price
ACC683B-6199-4	ACME Mountain Bike	Accessories, Bikes	PD-M562	80.99
6F811E8	HL Mountain Bike	Accessories, Bikes	AB-1234-56	48.74
7CAC2E8	Sport-100 Helmet, Black	Accessories, Helmets	HL-U509	12.99
B1E807E	Road Helmet, 45	Accessories, Helmets	AB-1234-56	48.74

Details pane on the right shows the JSON representation of the item data:

```

{
  "name": "Road Helmet, 45",
  "id": "123456789",
  "categoryId": "123456789",
  "SKU": "AB-1234-56",
  "description": "The product called \"Road Helmet, 45\"",
  "price": 48.74
}

```

Task list on the right:

- Select any of the items in the list to see a JSON representation of the item data.
- At the top of the page, select **New Item** to create a new blank item.
- Modify the JSON for the new item as follows, and then select **Save**.

Bottom status bar: 0 0 297 | Search | Back | Forward | Home | Taskbar | ENG US | 5:46 AM | 1/29/2025

The screenshot shows the Microsoft Azure portal with the URL [Home > Microsoft.Azure.CosmosDB-20250129065025 | Overview > sqlaccount](#). The left sidebar has the Data Explorer blade selected. The main area shows the same Data Explorer interface as above, with the query results and JSON representation. A confirmation dialog at the bottom asks: "Are you sure you want to end this lab?". Buttons: Yes, end my lab | No, not yet.



Day 3: Task 3

Please complete the below lab (5) 'Explore data analytics in Azure' and paste evidence of the completed lab in the box provided.

The image shows two screenshots side-by-side. On the left is a screenshot of a web-based lab management system. It features a header with a lab icon and the title 'Explore data analytics in Azure'. Below the title is a sub-header 'Learning Path 04 (CSS)'. The main content area displays various configuration details for the lab:

Duration:	3 Hours
Lab Series:	DP-900T00-A Microsoft Azure Data Fundamentals [Cloud Slice Provided]
Virtualization Platform:	Hyper-V
RAM:	6.5GB
Cloud Platform:	Azure
Content Version:	2
Is Exam:	No
Status:	Not Running

At the bottom of this section is a 'Launch' button. On the right is a screenshot of a Microsoft Fabric workspace creation interface. A blue sidebar on the left says 'Complete d lab'. The main area has a title 'Create a workspace' and a browser-like header showing the URL 'https://app.fabric.microsoft.com/groups/0463dd16-82ec-4d6c-82ba-21a0b50563b...'. The workspace navigation bar includes 'Home', 'Workspaces' (which is selected), 'OneLake', and 'Yrworkspace'. The 'Yrworkspace' item is highlighted with a green border. The workspace content area shows a large circular icon with a plus sign and the text 'Choose from predesigned task flows or add a task to build one (preview)'. Below this, smaller text reads 'Select from one of Microsoft's predesigned task flows or add a task to start building one yourself.'



data in your lakehouse

New shortcut
Access data that resides in an external lake.

Instructions **Resources** **Help**

6. On the **Review + save** page, ensure that the **Start data transfer immediately** option is selected, and then select **Save + Run**.

A new pipeline containing a **Copy Data** activity is created, as shown here:

When the pipeline starts to run, you can monitor its status in the **Output** pane under the pipeline designer. Use the **↻ (Refresh)** icon to refresh the status, and wait until it has succeeded (which may take 10 minutes or more).

7. In the hub menu bar on the left, select your lakehouse.

8. On the **Home** page, in the **Lakehouse explorer** pane, in the **... menu** for the **Tables** node, select **Refresh** and then expand **Tables** to verify that the **taxi_rides** table has been created.

Note: If the new table is listed as *unidentified*, use its **Refresh** menu option to refresh the view.

Ingest data

Instructions **Resources** **Help**

3. On the **Connect to data source** page, view the tables in the data source. There should be one table that contains details of taxi trips in New York City. Then select **Next** to progress to the **Choose data destination** page.

4. On the **Choose data destination** page, select your existing lakehouse. Then select **Next**.

5. Set the following data destination options, and then select **Next**:

- o **Root folder:** Tables
- o **Load settings:** Load to new table
- o **Destination table name:** taxi_rides (You may need to wait for the column mappings preview to be displayed before you can change this)
- o **Column mappings:** Leave the default mappings as-is
- o **Enable partition:** Unselected

6. On the **Review + save** page, ensure that the



Ingesting data using a lakehouse

The screenshot shows the Microsoft Fabric web interface. On the left, the sidebar includes sections for OneLake, Monitor, Real-Time, Yworkspac, Ingest Data, and Lakehouse. The main area displays a table titled "taxi_rides" from the "Ylakehouse" database, showing 1000 rows of data. The table has columns: lpepPickupD..., lpepDropoff..., passengerC..., tripDistance, puLocationId, doLocationId, and a timestamp column. A note at the top right says: "A new pipeline containing a **Copy Data** activity is created, as shown here:". Below this is a step-by-step guide:

7. In the hub menu bar on the left, select your lakehouse.
8. On the Home page, in the ... menu for the Tables node, select Refresh and then expand Tables to verify that the taxi_rides table has been created.

Note: If the new table is listed as unidentified, use its Refresh menu option to refresh the view.

Query data lakehouse using SQL analytics end points

The screenshot shows the Microsoft Fabric web interface with the "SQL analytics endpoint" selected. The main area features a "SQL query 1" editor with the following SQL code:

```

1 SELECT DATENAME(dw,lpepPickupDatetime) AS Day,
2        AVG(tripDistance) AS AvgDistance
3   FROM taxi_rides
4  GROUP BY DATENAME(dw,lpepPickupDatetime)
    
```

The results pane shows a table with three rows:

Day	AvgDistance
Tuesday	2.82074476088204
Saturday	2.98862075182174
Friday	2.85009385216235

A note at the top right says: "Now that you have ingested data into a table in the lakehouse, you can use SQL to query it." A step-by-step guide follows:

1. At the top right of the Lakehouse page, switch from **Lakehouse** view to the **SQL analytics endpoint** for your lakehouse.
2. In the toolbar, select **New SQL query**. Then enter the following SQL code into the query editor:

```

sql
SELECT DATENAME(dw,lpepPickupDate
AVG(tripDistance) AS AvgDis
FROM taxi_rides
GROUP BY DATENAME(dw,lpepPickupDate)
    
```

3. Select the **Run** button to run the query and review the results, which should include the average trip distance for each day of the week.

Explore data analytics in Azure
2 Hr 29 Min Remaining

Instructions Resources Help Search 100%

Visualize data in a lakehouse

Microsoft Fabric lakehouses organize all tables in a semantic data model, which you can use to create visualizations and reports.

1. At the bottom left of the page, under the **Explorer** pane, select the **Model** tab to see the data model for the tables in the lakehouse (this includes system tables as well as the **taxi_rides** table).

2. In the toolbar, select **New report** to create a new report based on the **taxi_rides**.

3. In the report designer:

- In the **Data** pane, expand the **taxi_rides** table and select the **[ip]pickupDatetime** and **passengerCount** fields.
- In the **Visualizations** pane, select the **Line chart** visualization. Then ensure that the **X-axis** contains the **[ip]pickupDatetime** field and the **Y axis** contains **Sum of passengerCount**.

Previous Next >

Visualize data in a lakehouse

Instructions Resources Help Search 100%

Tip: You can use the >> icons to hide the report designer panes in order to see the report more clearly.

4. On the **File** menu, select **Save** to save the report as **Taxi Rides Report** in your Fabric workspace.

You can find the report in the page for your workspace in the Microsoft Fabric portal.

Clean up resources

If you've finished exploring Microsoft Fabric, you can delete the workspace you created for this exercise.

1. In the bar on the left, select the icon for your workspace to view all of the items it contains.

2. In the ... menu on the toolbar, select **Workspace settings**.

3. In the **Other** section, select **Remove this**.

Previous Next >

Instructions Resources Help Search 100%

Tip: You can use the >> icons to hide the report designer panes in order to see the report more clearly.

4. On the **File** menu, select **Save** to save the report as **Taxi Rides Report** in your Fabric workspace.

You can find the report in the page for your workspace in the Microsoft Fabric portal.

Clean up resources

If you've finished exploring Microsoft Fabric, you can delete the workspace you created for this exercise.

1. In the bar on the left, select the icon for your workspace to view all of the items it contains.

2. In the ... menu on the toolbar, select **Workspace settings**.

3. In the **Other** section, select **Remove this**.

Previous Next >



The workspace including the new report Taxi Rides Report.

The screenshot shows the Microsoft Fabric workspace interface. At the top, there's a navigation bar with 'Fabric' and 'Yrworkspace' tabs, a search bar, and various workspace settings like 'Trial: 59 days left'. Below the navigation bar is a toolbar with 'Create deployment pipeline', 'Create app', 'Manage access', and 'Workspace settings' buttons. A central area displays a list of items under 'Yrworkspace', including 'Taxi Rides Report' which is highlighted. The list includes:

	Name	Type	Task	Owner
	Ingest Data	Data pipeline	—	User1-47883395
	Taxi Rides Report	Report	—	Yrworkspace
	Yrlakehouse	Lakehouse	—	User1-47883395
...				
	Yrlakehouse	Semantic model (...)	—	Yrworkspace
	Yrlakehouse	SQL analytics end...	—	User1-47883395

This screenshot shows the Microsoft Fabric report designer interface. The left sidebar lists the workspace structure with 'taxi rides report' selected. The main area displays a visualization titled 'Sum of passengerCount by lpepPickupDatetime', which is a line chart. The top right corner of the visualization has a tooltip: 'Explores data analytics in recent 2 Hr 29 Min Remaining'. The right side of the screen contains a 'Instructions' pane with steps for creating the report, a 'Resources' pane, and a 'Help' section. A tip at the bottom right says: 'Tip: You can use the >> icons to hide the report designer panes in order to see the report more clearly.' At the bottom, there are 'Clean up resources' instructions and navigation links for 'Previous' and 'Next' steps.



The screenshot shows a Data Studio dashboard with two main components. On the left, there is a table titled "Support Information" with columns: ID, Date, Description, and Status. On the right, there is a KQL editor window with a query results table. The KQL editor shows a flowchart with nodes like "Raw Data", "Insert", and "Sink". The results table has columns: qid, timestamp, baseline_count, smrteval_timestamp, tpm_tpciq_timestamp, and Qid. The data in the table is as follows:

qid	timestamp	baseline_count	smrteval_timestamp	tpm_tpciq_timestamp	Qid
15.0	0.5	2018-01-09-00:00:00	2018-01-09-00:00:00	2018-01-09-00:00:00	S
22.0	0.5	2018-01-09-00:00:00	2018-01-09-00:00:00	2018-01-09-00:00:00	S
1.5	0.7	2018-01-09-00:00:00	2018-01-09-00:00:00	2018-01-09-00:00:00	T
88.5	0.7	2018-01-09-00:00:00	2018-01-09-00:00:00	2018-01-09-00:00:00	S
88	0.7	2018-01-09-00:00:00	2018-01-09-00:00:00	2018-01-09-00:00:00	S
10.1	0.7	2018-01-09-00:00:00	2018-01-09-00:00:00	2018-01-09-00:00:00	S
0.0	0.7	2018-01-09-00:00:00	2018-01-09-00:00:00	2018-01-09-00:00:00	T

Unfortunately, I am unable to complete the lab as the kQL database is unavailable.



Day 4: Task 1

In your teams, complete the Azure DP-900 practice exam and paste your result below – this is open book and please research and discuss your answers as a team.

6 🔗	<p>Practice Assessment: DP-900T00-A Microsoft Azure Data Fundamentals Practice Assessment for Microsoft Certifications for DP-900T00-A</p> <p>Additional Details Required: No Available Instructor-Led: Yes Available Self-Paced: Yes</p>
Result	<p>The screenshot shows the Microsoft Learn dashboard with the following details:</p> <ul style="list-style-type: none">Header: learn.microsoft.comPage Title: Practice Assessment Results: January 30, 2025Image: Microsoft EXAM logoText: Practice Assessment for Exam DP-900: Microsoft Azure Data FundamentalsText: It took you 49 minutes to complete this assessment.Section: Overall ResultsText: To be better prepared for the exam, aim to achieve a score of 80% or higher in multiple attempts.Text: Score: 82%Progress Bar: A horizontal progress bar with a green segment representing 82% completion.Button: Show My Answers



Day 4: Task 2

1. Scenario Background

"Paws & Whiskers" is a growing pet shop that aims to improve its business by analysing sales, customer information, and inventory data. Currently, the data is collected manually or stored in spreadsheets. Management is interested in transitioning to Microsoft Azure to streamline data storage, analysis, and reporting, enabling them to make data-driven decisions.

2. Data Laws and Regulations

Identify and explain the data laws and regulations relevant to handling customer data within the proposal. Ensure you cover the following points:

- **GDPR Compliance:** Highlight the importance of adhering to the General Data Protection Regulation (GDPR), particularly as it relates to storing and processing customer information.
- **Data Protection Act (DPA) 2018:** Outline how the DPA 2018 may affect the way "Paws & Whiskers" collects and stores data, ensuring compliance with UK laws on data privacy.
- **Other Industry Standards:** Research any additional data protection standards or regulations that may apply to pet shop data, particularly if they involve sensitive or payment information.

3. Azure Service Recommendations

Recommend Microsoft Azure services that would suit the company's data analysis needs and explain why these services are suitable. Your recommendations should include:

- **Data Storage:** Identify suitable storage options, such as **Azure Blob Storage** or **Azure SQL Database**, and discuss the benefits of each for storing large datasets, including inventory, sales transactions, and customer details.
- **Data Analysis Tools:** Recommend tools such as **Azure Machine Learning** for customer behaviour analysis or **Azure Synapse Analytics** for analysing sales trends.
- **Data Integration and Automation:** Explain how services like **Azure Data Factory** could automate data collection and integration processes, improving efficiency.

4. Data Types and Data Modelling

Define the types of data "Paws & Whiskers" will need to work with and describe your approach to data modelling:

- **Data Categories:** Identify key data types, such as customer demographics, transaction history, pet inventory, and product categories.



- **Data Modelling Approach:** Outline how you would structure this data using a relational model or a data warehouse approach, considering factors like tables, entities, relationships, and primary keys.

5. Data Storage Formats and Structures in Azure

Discuss how you would store data within Azure and the formats you would recommend:

- **Data Formats:** Specify recommended formats (e.g., CSV for raw data imports, JSON for structured data, Parquet for analytics) and explain why these formats are suitable for specific data types.
- **Data Security and Encryption:** Include recommendations for securing data using Azure's built-in encryption features and access controls to ensure compliance with data privacy regulations.

6. Additional Considerations

Provide any other considerations that might enhance data handling and efficiency in Azure, such as:

- **Backup and Disaster Recovery:** Outline a backup plan using **Azure Backup** or **Azure Site Recovery** to safeguard against data loss.
- **Data Visualisation:** Discuss potential use of **Power BI** within Azure for creating dashboards that provide management with real-time insights into sales and customer trends.
- **Future Scalability:** Comment on how Azure services can scale as the business grows, accommodating larger datasets and more complex analyses.

Submission Guidelines:

1. **Structure:** Ensure your report is well-organised, with sections for each task (e.g., Data Laws, Azure Services, Data Types, etc.).
2. **Formatting:** Include headings, bullet points where appropriate, and any visuals or diagrams that support your explanations.
3. **References:** Cite any resources or regulations referenced in the report.
4. **Length:** Aim for 1500-2000 words.





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TRANSITIONING TO MICROSOFT AZURE

Table of content:

1. Data Laws and Regulations
2. Azure Service recommendations for “Paws & Whisker”
3. Data Types and Data Modelling
4. Data Storage Formats and Structures in Azure
5. Additional Considerations



1. Data Laws and Regulations

"Paws and Whiskers" must ensure that data is collected, stored, processed and secured, in compliance with relevant laws. The key regulations to consider:

- General Data Protection Regulation (GDPR): The pet shop must establish a lawful basis for collecting and processing customer data and while providing clear explanations of what data is collected. Customers have the right to access their data under the data subject rights. In addition, the business must regularly review and update privacy policies to reflect changes in data handling practices.
- Data Protection Act (DPA) 2018: If the pet shop collects sensitive information, such as pet health records or customer payment details, it must implement strict security measures to protect this data.
- Health and Safety Regulations: "Paws and Whiskers" must ensure compliance with health-related regulations when collecting and handling pet health information.
- Consumer Rights Act 2015: The shop must maintain transparency in pricing, terms, and conditions to ensure fair treatment of customers.

By adhering to these regulations, "Paws and Whiskers" can ensure legal compliance and build customer trust.

2. Azure Service recommendations for "Paws & Whisker"

to streamline data collection, enhance storage capabilities and improve business insights, I recommend the following Azure services for collecting data manually and to have a strong service storage I recommend for "Paws& Whisker":

- Azure Blob storage: to eliminate manual data collection and provide a reliable storage solution. Azure Blob storage is suitable for handling both structured and unstructured data, such as photos and videos. It offers cost-efficient storage, particularly with the hot tier, which allows frequent access to data which ensuring scalability and security.
- Azure synapse analytics: for data analysis, Azure Synapse Analytics provides a unified analytics platform, which makes it highly effective for handling large datasets. It enables real time insights, supports data streaming, and integrated with Power BI. This allows the pet shop to generate interactive dashboards and reports, visualising key metrics such as top-selling products and sale revenue.
- Azure Data Factory: for data integration and automation, Azure Data Factory offers automated data pipelines which can pull data from the point-of-sale system and load it into Azure Blob Storage. This automation minimizes manual effort and improves data accuracy.

By combining the use of Azure Blob storage, Azure Synapse Analytics and Azure Data Factory, "Paws & Whiskers" can enhance its data management, gain deeper business insights, and support future growth efficiently.

3. Data Types and Data Modelling

This section explores the different data types and data modelling approaches for the pet shop, "Paws& Whiskers". It defines the data types, entities and their relationships, followed by the construction of tables and then organisation in star schema (see Figure 1). To effectively manage its operations, the pet shop must categorise its data into key groups,



including sales data, customer data, inventory data and pet data. In this scenario, the Entity Relationship Model (ERD) is used to establish relationships between the entities (tables), while the star schema structures data into fact and dimension tables (see Table 1). This approach enhances data organisation and supports efficient analytical processing, enabling the pet shop to derive valuable business insights.

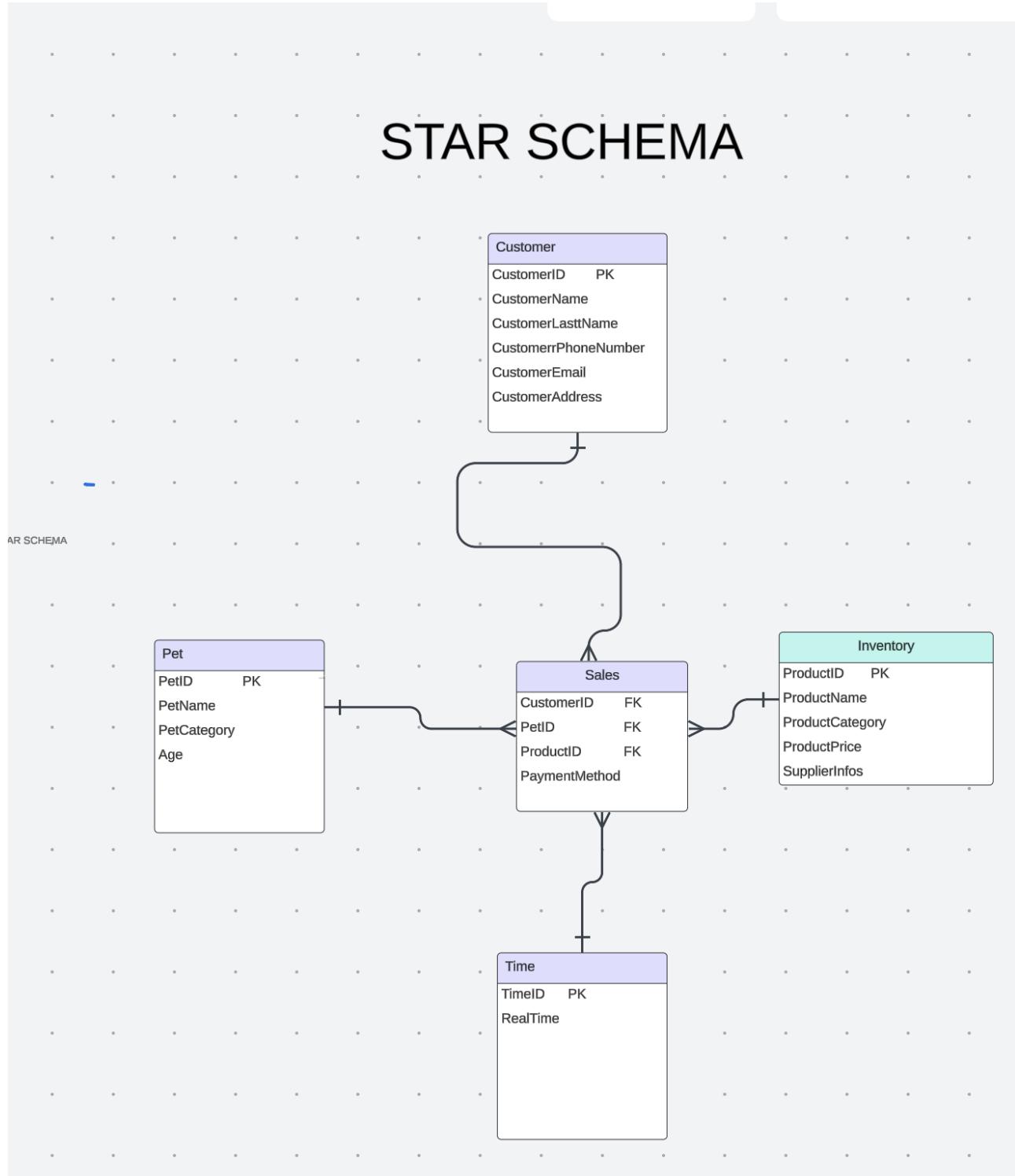


Figure 1: Organisation in star schema



Customer Table

CustomerID (PK)	FirstName	LastName	PhoneNumber	Email	Address

Pet Table

PetID (PK)	PetName	PetCategory	Age

Inventory Table

ProductID	ProductName	ProductCategory	ProductPrice	SupplierInfo

Time Table

TimeID	RealTime

Sales Table

CustomerID(FK)	PetID(FK)	ProductID(FK)	PaymentMethod

Table1. Dimension tables

The Fact table: The sales table consists of four composite keys which are: CustomerID, PetID, ProductID, and TimeID.

4. Data Storage Formats and Structures in Azure

When choosing the appropriate data storage formats for the pet shop, it is crucial to consider performance, scalability and security. Based on these factors, I recommend using CSV file and JSON formats.

- CSV files are suitable for storing structured data, which can be easily accessed by tools such as Excel, power Bi and Azure services. They are particularly useful for managing data as customer information inventory lists and pet's details. The format also simplifies the ETL (Extract, Transform, Load) process, making it easy to handle and analyse structured data efficiently.
- JSON files are ideal for storing semi-structured and unstructured data. They integrate easily with Azure Cosmos DB, enabling real-time querying and analysis. JSON is flexible, hierachal structure makes it a good choice for storing customer data (e.g. names, addresses, payment details) as well as the unstructured data such as pet images and videos. This format is useful when dealing with large datasets that require advanced analytical processing.



- Parquet Files is well-suited for storing aggregated data over time, providing high compression ratios and being compatible with Azure Synapse Analytics.

Data Security and Encryption: The pet shop must prioritise data privacy laws and the protection of sensitive customer information. To ensure the security of customer details, the pet shop should encrypt customer data using HTTPS/TLS protocols during transit between the client and Azure Cosmos DB. In addition, access to data must be tightly controlled. It is recommended full access to an IT person and the manager, while restricting others to view only the necessary information. This ensures that sensitive data is protected, and only authorised personnel can access critical business information.

5. Additional Considerations

Backup and disaster recovery: To ensure business continuity and protect against data loss, "Paws & Whiskers" should transition to Microsoft Azure, using Azure Backup. This service offers secure, cloud-based backup for critical data, ensuring the privacy and protection of sensitive information, such as inventory data, from potential cyberattacks. Azure Backup supports regular backups (daily or weekly) to maintain data integrity while minimising costs. It also includes monitoring and alert features to track jobs and notify the pet shop of any failures.

For disaster recovery, Azure Site Recovery can replicate on-premises servers, safeguarding the pet shop's data during failures or natural disasters. Another strategy of recovery, such as the Recovery Time Objective and Recovery Point Objective, should be implemented to minimise downtime and prevent data loss. By applying these strategies, the pet shop's data will be continuously protected.

Data visualisation with Power BI: Power BI, integrated with Azure, enables real-time interactive dashboards and customisable reports, helping "Paws & Whiskers" visualise important business metrics. The pet shop can use Power BI to display insights such as monthly sales revenue and inventory turnover rates by products, improving overall decision-making and operational efficiency.

Scalable Data Storage: As the pet shop's demand increases, Azure offers scalable data storage solutions. Azure Blob Storage and Azure Cosmos DB are designed to support global distribution and automatic scaling, making them ideal for handling large volumes of data. NoSQL is especially suited for managing big data. In addition, Azure Synapse Analytics provides advanced data analysis capabilities, enabling the pet shop to perform in-depth analytics as its data needs increase.



END OF WORKBOOK

Please check through your work thoroughly before submitting and update the table of contents if required.

Please send your completed work booklet to your trainer.

