Cloud Development B

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I hereby declare that I did not plagiarise the content of this assignment and that this is my own work.

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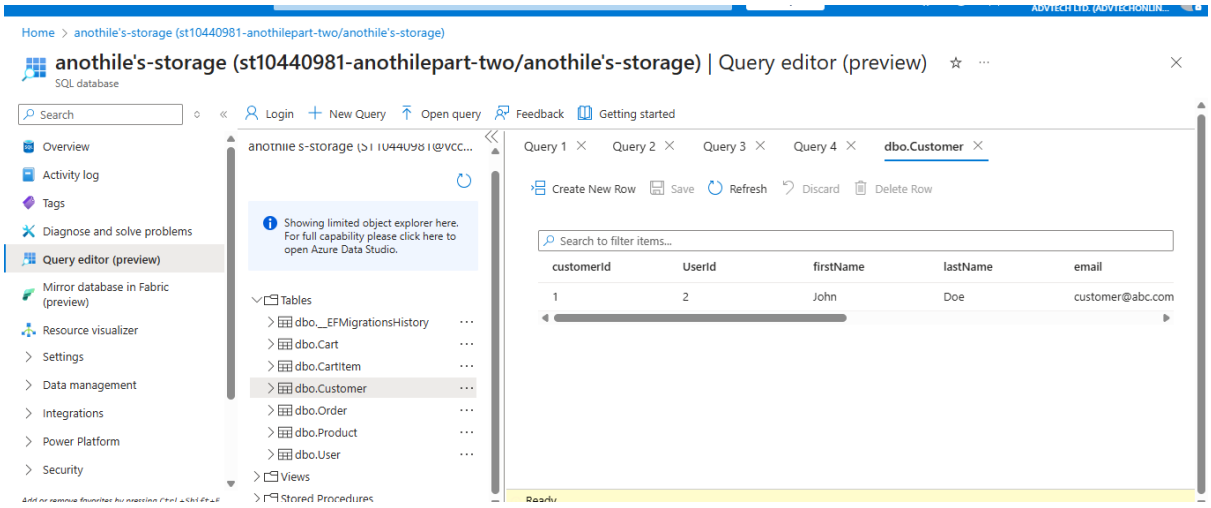
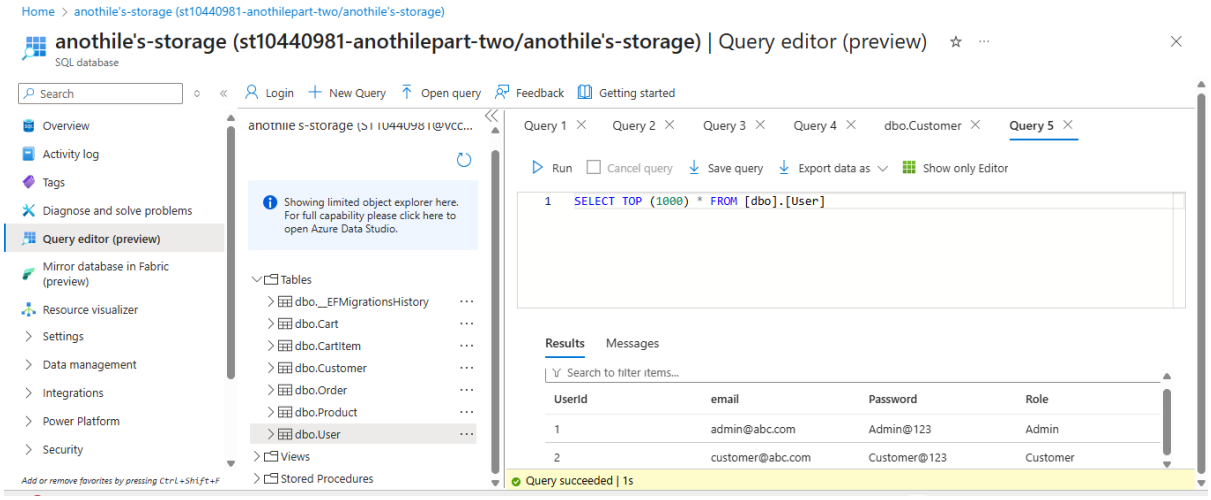
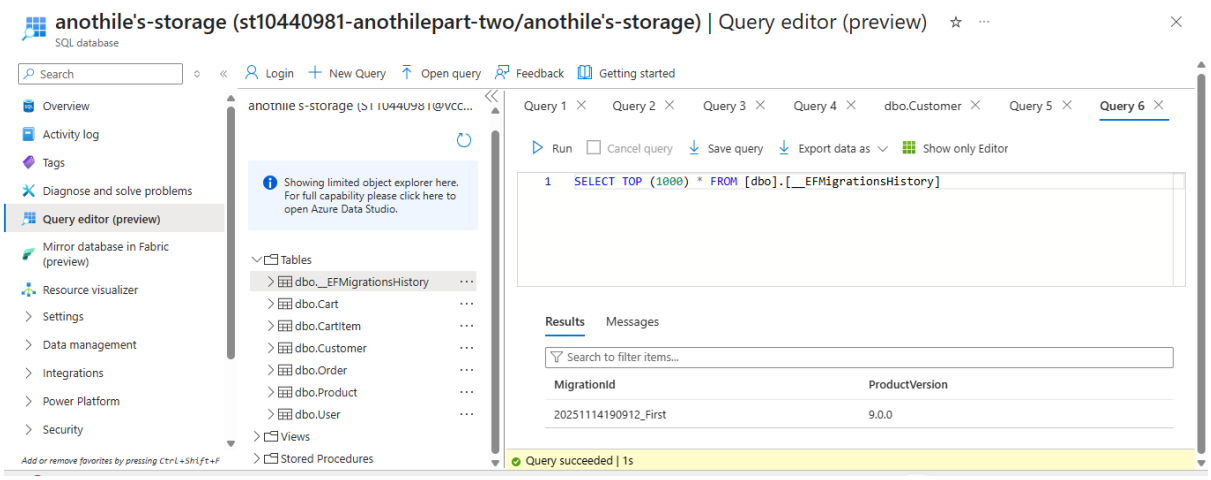
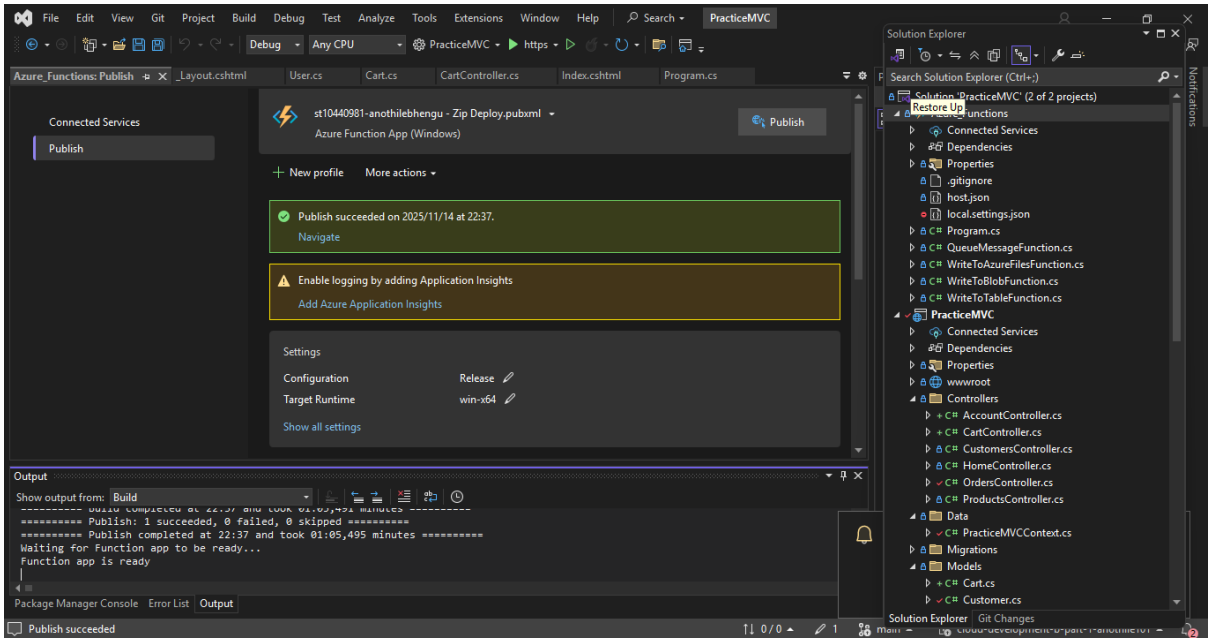


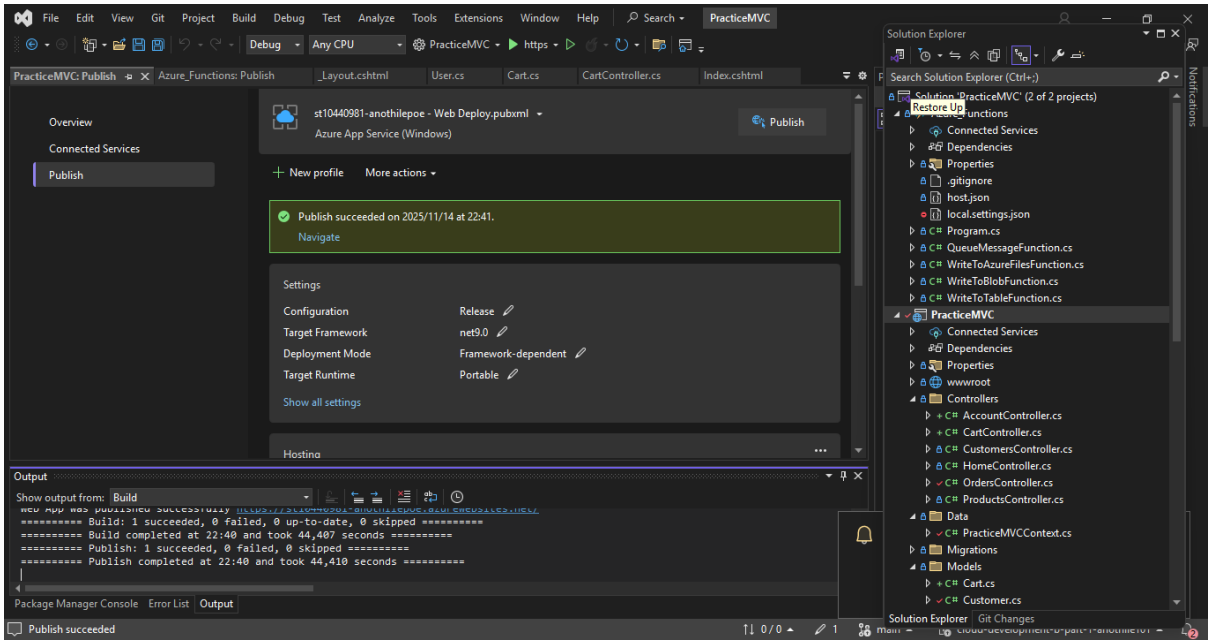




Azure Functions Published



App Deployed



Links:

Azure: https://st10440981-anothilepoe.azurewebsites.net/

GitHub: https://github.com/IIEVCPMB/cloud-development-b-part-1-anothile101.git

Theory Section B

Component	Azure Service	Technology choice	Hosting model	Purpose
Web Application	Azure app service	Compute	Platform as a service	Hosts the web app that administrators and consumers can access via a web browser. Hosting, load distribution, server administration, and secure SSL connectivity are all seamlessly handled by Azure (GeeksforGeeks, 2025).
SQL login database	Azure SQL database	Data storage	Platform as a Service	Saves login details, customer records and products information, it offers profound safety functions, a reliable service (GeeksforGeeks, 2025).
Authentication	SQL server	Gateway	Platform as a Service	Authorizes the identity of individuals logging in using the web app. Approves connection strings with safe accounts to be used for the user and customer verification (GeeksforGeeks, 2025).
Product images	Azure blob storage	Data Storage	Platform as a Service	Stores digital content and product photos. It delivers fast accessibility and backup through the use of private URLs. It also offers versatility (GeeksforGeeks, 2025).
Product page	Azure table storage	Data storage	Platform as a Service	Contains partially structured data that does not require database patterns including product specifications, inventories and

				consumer needs (GeeksforGeeks, 2025).
Order queue system	Azure queue storage	Messaging service	Platform as a Service	Handles the flow of background messaging amongst the front end and back-end operations. It separates functions as well as enhance responses by storing notifications such as order placed and orders processed (GeeksforGeeks, 2025).
Automatic order processing	Azure functions	Compute	Function as a Service	Utilizes charging and automated scaling to carry out background operations that are generated by queue messages such as status updates, delivering alerts or reminders and processing orders (GeeksforGeeks, 2025).
App Deployment	Azure app service, GitHub	Automation tool	Software as a Service	The code is pushed to the GitHub repository and deployed to the azure app service, guarantees simple modifications and regular releases (GeeksforGeeks, 2025).

Theory section C

Secure login

Azure service used: Azure SQL database

Requirements: Customers and managers should be able to login into the system with different access levels (GeeksforGeeks, 2025). Consumers should be able to handle their profiles and sign in whilst the administrators should handle the product and order system. The system to advocate for data integrity and protections amongst login credentials to prevent unauthorised access (GeeksforGeeks, 2025).

Motivation:
Microsoft offers a cloud-based solution for handling and storing relational data called Azure SQL Database. It provides a controlled environment that takes care of things like encryption and recovery (GeeksforGeeks, 2025). Users are able to conduct requests, construct databases, and arrange the information in tables. It offers availability and adaptability from any location with a web connection. The database stores private information, and user roles (GeeksforGeeks, 2025). Private information is kept safe by the integrated security features which include firewalls and role-based authentication. Since the hosting model is platform as a service product and availability are increased since the upgrades and recoveries happen automatically (GeeksforGeeks, 2025). It's a suitable solution for managing authentication in the ABC Retail setting as it grows completely throughout the times of increased traffic like store sales (GeeksforGeeks, 2025).

Product Image

Azure service used: Azure blob storage

Requirements: For each product when the user uploads and image the application stores the image so it could be accessed when needed. The system has to be efficient and reliable in order to store high resolution product images (Guiding tech, 2024). The system updates should not affect the main sever and back up and recovery is implemented (Guiding tech, 2024).

Motivation:

Blob storage allows you to exchange documents, photos, and videos using a browser. When you desire to sort through enormous amounts of data in just one container for data evaluation, it's also an excellent resource for backup of information. The first step is to set up storage accounts and containers (Guiding tech, 2024). It provides worldwide replication, outstanding resilience, and graded costs, that lowers prices for objects that are rarely used. Downloadable and uploading images are safe because of the integrated

with web applications (Guiding tech, 2024). The azure blob storage is a good solution for ABC Retail as it needs to display a lot of product images quickly and affordably (Guiding tech, 2024).

Product page

Azure service used: Azure table storage

Requirements: Customer and product data has to be stored in the system. The database required adaptability past conventional relationship restrictions because product details can change and additional information might be introduced as time passes (Learn Microsoft, 2025). Versatile framework for product data such as category, product description and product price (Learn Microsoft, 2025).

Motivation:

Azure Table storage is a cloud-based service that offers a key-value store with a declarative design for storing independent structured data, commonly referred to as structured NoSQL data (Learn Microsoft, 2025). The declarative nature of table storage makes it simple to modify ABC Retail data as ABC Retail app's requirements change (Learn Microsoft, 2025). For many kinds of apps, table storage access to information is quick and economical, and for comparable data amounts, it is usually less expensive than standard SQL. Large volumes of organized information are stored in Azure Table storage. Validated calls from both within as well as outside of the Azure cloud are accepted by the NoSQL datastore services (Learn Microsoft, 2025). Structured, non-relational data is best stored in Azure tables. It is ideal for maintaining or updating user information or product details with no rigid structural limitations (Learn Microsoft, 2025). The platform as a service data storage needs less management as it expands autonomously. When it’s compared to a complete relationship database that has less important information, the method increases speed for analysing product description and it lowers expenses (Learn Microsoft, 2025).

Order Processing

Azure service used: Azure Queue storage

Requirements: The system has to handle orders that were placed by customers, the system needs to process them simultaneously in order to minimize delays and be proactive (ScholarHat, 2025). The system had to manage consumer orders effectively without slowing down or crashing the web page. When an order is submitted, the program should immediately record the query and handle updates and confirmations (ScholarHat, 2025).

Motivation:

Azure Queue Storage is a cloud solution that lets you organize and store messages across various application elements. Instantaneous interaction is made possible by it, guaranteeing that messages are consistently queued and handled separately (ScholarHat, 2025).
By separating components and letting them operate at their own pace, this technique assists scale applications and improve performance.While clients are making purchases. Since the app is now processing every order, you cannot allow it to slow down (ScholarHat, 2025). Alternatively, you may manage each order separately or in bunches by placing them in a queue. Independence the program's components can function independently, making updates and fixes simpler (ScholarHat, 2025). Azure queue storage can manage thousands of messages or just a few, allowing the retail app to develop without any problems (ScholarHat, 2025). ABC Retail won't miss any crucial duties because messages are stored securely until they are chosen. It assists in distributing work equally so that no area of your application becomes overburdened (ScholarHat, 2025). If a message is unsuccessful, it can stay in the queue for a subsequent try, which simplifies debugging (ScholarHat, 2025). The platform as a service model helps separate the order process from the database process such stricture enhances efficiency and makes sure that orders don’t get lost during the periods of high traffic (ScholarHat, 2025).

Automatic order processing

Azure service used: Azure functions

Requirements : In order to manage queue orders as well as updating the database and sending confirmations without the need of human intervention ABC Retail required an automated solution. In order to minimize inefficiencies and operating expenses, this procedure had to take place without human interference (ScholarHat, 2025).

Motivation:

Azure Functions is a robust serverless compute solution that eliminates the need for server management by allowing you to execute brief code segments, known as functions, in reaction to events such as newly received messages in the order queue, by executing brief code segments (ScholarHat, 2025). As a component of the function as a service architecture, ABC Retail just need to provide the code logic.Azure handles servers, upkeep, and expansion (ScholarHat, 2025). Azure functions make it simple and flexible to create event-based solutions, whether you're adjusting to an HTTP request, handling a queue message, or replying to a database modification (ScholarHat, 2025).

Functions are initiated via triggers. These triggers may originate from planned timetables, HTTP requests, or notifications from technologies like Azure Event Hubs, Azure Blob Storage, or Azure Cosmos DB (ScholarHat, 2025). Without having to write code, connectors act as a link among functions and other resources.
Because azure functions use a serverless design, developers have no concern about server management (ScholarHat, 2025). It is perfect for managing repetitive processes like generating logs, sending confirmations, and altering or updating the orders status. The automation lowers operating expenses by boosting productivity and reducing the requirement for background servers (ScholarHat, 2025).

Web deployment

Azure service used: Azure app service

Requirements: To deploy to the web app without the need of actual servers, the web app required a dependable, expandable web hosting platform (Cloudwards, 2025). Facilitates private HTTPS accessibility, automated load distribution and flexible (Cloudwards, 2025).

Motivation:

Web applications can be hosted on Microsoft Azure App Service, a platform for program creation and maintenance. It is a platform as a service solution that includes a predetermined framework for backend, web application, and API development. Among other things, microsoft azure app service provides a cloud-based platform for application deployment. Azure App Service takes care of deploying application requirements and providing computing for ABC Retail (Cloudwards, 2025). Most of the time, all they need to do to launch their apps is upload the code. After that, ABC Retail may use Azure Data Factory to connect their apps across different cloud services. It offers simultaneous deployment from GitHub and Azure, load sharing, and automated growth (Cloudwards, 2025). It guarantees excellent performance and streamlines upgrades while freeing the programmer to concentrate on writing instead of than server administration. ABC retail website needs to be operational (Cloudwards, 2025).

Theory Section D

User authentication

Azure serviced used: Azure SQL database

Alternative service: Azure Cosmo DB

Motivation:

NoSQL, conventional, and vector databases are all completely maintained by Azure Cosmos DB. It provides assured performance at any scale, seamless and rapid scaling, and a few millisecond response times (Learn Microsoft, 2025). High reliability and high-level security ensure uninterrupted operations. Azure Cosmos DB is a completely managed service that relieves you of database maintenance duties with automatic maintenance, upgrades, and management (Learn Microsoft, 2025). The service offers smooth authority over throughput allocation, search procedures, and similar levels, allowing ABC Retail to maximize both performance and price for ABC Retail particular workload (Learn Microsoft, 2025). It also manages capacity with affordable serverless and automated scaling choices that adapt to the application's requirements to match bandwidth with demand (Learn Microsoft, 2025). Azure services are integrated with Azure Cosmos. It is appropriate for applications that are essential because of its compatibility (Learn Microsoft, 2025). Low downtime and consistent efficiency are necessary for these apps. With fast processing of data, it would enable ABC Retail to maintain user accounts and login credentials across several geographical locations (Learn Microsoft, 2025). It makes two-factor authentication possible when linked with Azure Active Directory. Azure Cosmos DB would provide greater adaptability, reliability, and worldwide accessibility for contemporary verification applications, even though Azure SQL is a good fit for organized relational information (Learn Microsoft, 2025).

Product Image

Azure service used: Azure blob storage

Alternative service: Azure data lake storage gen2

Motivation:

Microsoft's contemporary data lake technology, Azure Data Lake Storage Gen2, is based on Azure Blob Storage. It combines vast versatility, strong security, and effective data access into an integrated storage solution to satisfy the needs of large-scale big data processing (Learnomate, 2025). Large storage containers for various kinds of data are similar to data lakes. They can store unorganized information such as pictures, data

that is partially structured such as emails, and organized data such as spreadsheets (Learn Microsoft, 2025). Gen2 is an excellent option for data analysis and architecture processes because it combines the affordability of storage for objects with the functionality and structure of a conventional directory system (Learn Microsoft, 2025). This could prove helpful for ABC Retail if it wished to use predictive modelling or sophisticated statistics on media information that had been stored, such as determining which product photos attract the most attention (Medium, 2024).Gen2 would offer greater organized operations and potential statistical possibilities, rendering it an effective substitute for massive amounts handling data, even though blob storage is perfect for basic picture storage (Medium, 2024).

Order queue message

Azure service used: Azure queue storage

Alternative service: Azure Service bus

Motivation:

Microsoft Azure offers Azure Service Bus, a cloud-based messaging solution that facilitates dependable message delivery between apps and services. It enables independent interaction among several scattered application parts, guaranteeing message delivery even in the event that all or some of them are momentarily unavailable (Wirefuture, 2025). Retails frequently need a strong messaging system to manage interactions among small services, cloud-native apps, and hybrid environments due to the growing complexity of contemporary systems (Wirefuture, 2025). Developing robust applications requires the use of azure service bus, a fully maintained corporate messaging platform that guarantees safe, dependable, and dynamic communications. With integration with message ordering azure service bus offers a more sophisticated messaging infrastructure than queue storage. Service Bus would allow multiple customer handling of messages for ABC Retail (Wirefuture, 2025). When an order is submitted, a single topic might alert both the client service department and the stock management system (Wirefuture, 2025). With recognition methods, it also facilitates more dependable and safe message transmission.Azure service bus is a reliable enterprise grade option for developing intricate, influenced by events online shopping processes. Features like as redundancy identification and dead-letter queues assist manage transmission failures effectively (Wirefuture, 2025).

Order processing

Azure service used: Azure functions

Alternative service: Azure logic apps

Motivation:

Azure Logic Apps is a great cloud-based framework or service that lets you design and implement processes that are compatible with your data and application. This enables ABC retail to carry out specific tasks in your workflow in response to trigger fires (Azure lessons, 2024). One of the greatest options for automating a variety of operations and business procedures in both B2B and enterprise settings. Connectors known as logic app connectors are crucial components of the azure logic app (Azure lessons, 2024). Azure logic apps are very straightforward and user-friendly. ABC retail can automate company duties according to consumer demands with the aid of Azure logic apps. If they wish to investigate problems, they can do so with ease (Azure lessons, 2024). It is among the affordable platforms. Smooth interaction with web apps and mobile apps (Azure lessons, 2024). With the use of azure logic apps zero coding process management system, developers can graphically create processes that link several applications, including submitting emails confirming orders, changing products, or generating bills (Azure lessons, 2024). Azure logic apps are more appropriate for workflow implementation where non-programmers might be required to construct or manage procedures, even if Azure Functions is very adaptable for customized code-based events (Azure lessons, 2024). Azure logic apps would make it easier for ABC Retail to automate routine operations such as synchronizing sales information with systems for monitoring or sending out order monitoring messages (Azure lessons, 2024).

App deployment

Azure service used: Azure app service

Alternative service: Azure Kubernetes service

Motivation:

Container based applications can be deployed and maintained with Azure Kubernetes Service, an administered Kubernetes service (Learn Microsoft, 2025). To utilize AKS, ABC Retail require very little experience with container management. By shifting a large portion of the management of Kubernetes to Azure, AKS lowers its complexity and operational cost. AKS is the perfect platform for handling and deploying containerized apps that need to be highly available, scalable, and portable (Learn Microsoft, 2025). It

can also be used to deploy apps to several locations, integrate with current DevOps tools, and use open-source technologies. By transferring that obligation to Azure, AKS lowers the maintenance overhead and complexity of operating Kubernetes (Learn Microsoft, 2025). Azure instantly builds and setup an administration plane for you at no additional expense when you set up an AKS cluster. In comparison with the app service, Azure Kubernetes service would provide more control over flexibility, setup, and separation if ABC Retail wished to divide its system into components such as the cart, product and authentication services (Learn Microsoft, 2025). For the smooth deployment of docker-based containers, it enables continuous upgrades, intelligent growth, and integration with azure container registry (Learn Microsoft, 2025). While azure app service makes deployment easier, AKS provides enterprise-level adaptability and independence, which makes it perfect for broader websites or potential expansion (Learn Microsoft, 2025).

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