A screenshot of a group

Description automatically generated

In groups of 5 individuals, select a scenario as a team and create and utilize services, with a final demonstration of workflow and services created, and ensuring to delete resources. All scenarios are graded out of a score of 50 marks Any code generated, datasets, should be uploaded onto the team GitHub page. The screenshots and document explaining the reasoning and setting utilized will be uploaded to Brightspace. The regions selected should be East-US and select the cheapest development option.

Scenario #1:

In azure,

deploy virtual machines then manage them using the respective platform's management tools.

Students must then create an Azure Function app and configure it to use a database (e.g., Cosmos DB).

Then, implement a RESTful API using Azure Functions to interact with the database.

Implement an authentication mechanism for the API using Azure Active Directory (AAD) and OAuth 2.0.

Finally, deploy the Azure Function app and test the API using a tool like Postman.

The students will be evaluated on their ability to configure, secure, and optimize the virtual machines, azure functions, and databases. Following correct security protocols and best practices.

Scenario #2:

In azure, students must utilize a set of source data (e.g., customer data, transaction data) created themselves or use data off websites like Github or Kaggle and

load it into Azure Blob Storage.

Create a data warehouse in Azure Synapse Analytics and

use PolyBase to load data from Azure Blob Storage.

Utilize T-SQL scripts to transform the data in the data warehouse (e.g., aggregating, pivoting, and joining data).

Finally create a Power BI report that queries the data warehouse and presents it in a meaningful way for stakeholders.

The students will be evaluated on their ability to configure, secure, and optimize the Azure blob storage, Azure Synapse Analytics, and PolyBase. Following correct security protocols and best practices.

Scenario #3:

In azure, set up an Azure Virtual Network with multiple subnets and a load balancer to ensure high availability of virtual machines.

Create an Azure Data Factory pipeline to extract data from datasets.

Create an Azure Virtual Machine scale set and use Azure Data Factory to spin up multiple virtual machines to process the data.

Use Azure Data Factory to orchestrate the data processing pipeline across the virtual machines (e.g., running data transformations and aggregations).

Use Azure Load Balancer to distribute the workload evenly across the virtual machines and ensure that the data processing pipeline runs smoothly.

Monitor the performance of the data processing pipeline using Azure Data Factory and Azure Virtual Machine diagnostics to identify and troubleshoot any issues.

The students will be evaluated on their ability to configure, secure, and optimize the Azure blob storage, Azure Virtual Machine, Azure Data Factory, and Azure Load Balancers. Following correct security protocols and best practices.

**Required Documents:**

* Each group member will also complete a confidential Self and Peer Evaluation. The Peer Evaluation is submitted online see assignments section on the day the midterm is submitted.

Final report

* Include screenshots of every step and settings, please include the Microsoft Azure banner in the screenshots.
* Provide concise, short explanations on why certain settings were chosen, ie cost, compute power, etc
* One individual must submit the final report for the group under the assignments section in Midterm Project category, please include group members full names.