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Topic: Azure DevOps

Type: Weekly Coding Assessment

Qn -1: **Azure DevOps**:

* Azure DevOps is a set of development tools and services provided by Microsoft organization that aims to help teams plan, develop, test, and deliver software more efficiently.
* In simple terms, it's a platform that facilitates the entire software development lifecycle, from idea to deployment.

**Azure DevOps CI/CD Pipeline**:

* CI/CD stands for Continuous Integration/Continuous Deployment
* The CI/CD pipeline in Azure DevOps is a series of automated steps that facilitate the continuous integration and delivery of software.

**Continuous Integration (CI):**

* Azure DevOps integrates with various source control systems like Git, allowing developers to commit their code changes to a shared repository.
* The CI pipeline automatically triggers a build process whenever changes are pushed to the repository. During the build, the application code is compiled, dependencies are resolved, and unit tests are executed.

**Continuous Deployment (CD):**

* After successful builds, the CD pipeline takes over. It involves the automation of the deployment process to various environments (such as development, testing, staging, and production)

**Process of CI/CD Pipeline in Azure DevOps**:

1. Creation of Azure account

* Create an Azure account and add the subscription to your account

1. Creation of Azure DevOps Organization

* Search for the Service Azure DevOps Organization and Create one new DevOps organization

1. Creation of project in Azure DevOps

* Now, create a new project inside the DevOps organization to host the source code and to perform the CI/CD Pipeline operations

1. Connect the source repository

* Connect your project to a source control repository, such as Git. Azure DevOps supports Git repositories natively.

1. Create the build pipeline (CI – Continuous Integration):

* Build a pipeline to automate the compilation, testing, and packaging of the application. Here this process involves the creating a YAML or visual build definition.
* Then specify the build triggers, such as continuous integration on every code commit.
* Now, configure build tasks, such as restoring dependencies, compiling code, running tests, and producing artifacts.

1. Configuration of Build Artifacts:

* Specify the artifacts generated during the build process that need to be published and stored for use in the release pipeline.

1. Create Release Pipeline (CD – Continuous Deployment):

* Create and define a release pipeline to automate the deployment of the application to different environments.
* Set up release triggers, such as continuous deployment after a successful build.
* Configure stages for different environments and define the deployment tasks for each stage.

1. Define the Deployment Strategy:

* Choose a deployment strategy that suits the application, such as rolling deployments, canary releases, or blue-green deployments.
* Configure deployment gates and approvals in order to control the flow of deployments

1. Integration of Azure Services:

* Use the Azure-specific tasks in the pipeline for deploying applications to Azure services, databases, or other resources

10) Configure Variables and Secrets:

* Use variables to parameterize your pipeline configuration, making it easier to manage and customize for different environments.
* Securely store and manage secrets and sensitive information using Azure Key Vault or Azure DevOps variable groups.

11) Test the Pipeline:

* Test the CI/CD pipeline by committing code changes to the repository and observing the automated build and deployment processes.

Qn -2: **Azure Synapse**:

* Azure Synapse is like a data powerhouse that brings together different types of data, allows you to analyse it on a massive scale, and provides the tools needed to derive valuable insights for your business.
* It's a solution for organizations dealing with large and complex datasets, offering the flexibility to scale resources based on their analytical needs.

**Azure SQL**:

* Azure SQL refers to a family of managed relational database services offered by Microsoft Azure. These services provide a scalable and fully managed platform for deploying, managing, and maintaining SQL Server databases in the cloud.

**Azure SQL Pool**:

* Dedicated SQL pool refers to the standalone platform of enterprise data warehousing features that are generally available with Azure Synapse.

**Advantages of Azure Synapse**:

* Unified Analytics Platform:
* Scalability:
* Real-Time Analytics:
* Data Integration:
* Data Lake Integration:
* Dynamic Resource Allocation:
* Integration with Power BI:
* Advanced Analytics and Machine Learning

**Process of Azure SQL Server pool integration with Azure Synapse**:

1) Launch the Azure portal and navigate to the search bar and search the service Azure Synapse Analytics.

2) Create New workspace by filling all the necessary details.

3) Once created, launch the workspace.

4) Now select the Manage Option

5) Next Click the SQL pools.

6) Select the New option.

7) Give SQL pool name and performance level in the Basic tab

8) In additional settings click on None.

9) Now select the review and create.

10) Now SQL pool has been successfully integrated with synapse workspace.