Azure DevOps Coding Challenge

Pratik Wani

Leverage the practises of CI-CD Using azure Data engineering and explain the architecture of the Azure synapse

- Continuous Integration/Continuous Deployment (CI/CD) practices in Azure Data Engineering involve automating the process of building, testing, and deploying data solutions.
- Continuous Integration: CI ensures that if we are adding new things then it is automatically tested and integrated with older things
- Continuous Deployment: CD ensures that the code which passed through the CI, immediately made live with so that user can use it.

CI/CD Practices in Azure Data Engineering

- **VCS (Version Control System)**
  - VCS like Git is used to store the code and configurations of data engineering solutions
  - VCS supports SQL scripts, Python notebooks as well

- **Automated Testing**
  - In CI-CD pipeline the newly added code is tested automatically, it validates the functionalities of code also checks the performance of the code under different aspects
  - It performs unit tests, integration tests, and performance tests as part of the CI/CD process to ensure the reliability of the solutions.

- **Automated Builds**
  - It provides a functionality of automated build pipelines and it triggers when we push new changes using VCS
  - It automatically runs the code, validate the code by performing different test

- **Monitoring**
    - Automated monitoring system is present to track the performance, usage, and errors in the deployed data solutions.
    - It keeps the members updated by sending alerts to all the team member for any issues or bugs comes in the process

Architecture of the Azure synapse

- Azure Synapse is a cloud-based analytics service that integrates enterprise data warehousing and Big Data analytics

- **SQL Pools**
    - A dedicated SQL pool in Azure Synapse architecture is a fully managed, cloud-based, and optimized data warehouse.
    - SQL Pools offer on-demand or provisioned resources for running T-SQL queries and analytics workloads against large datasets.

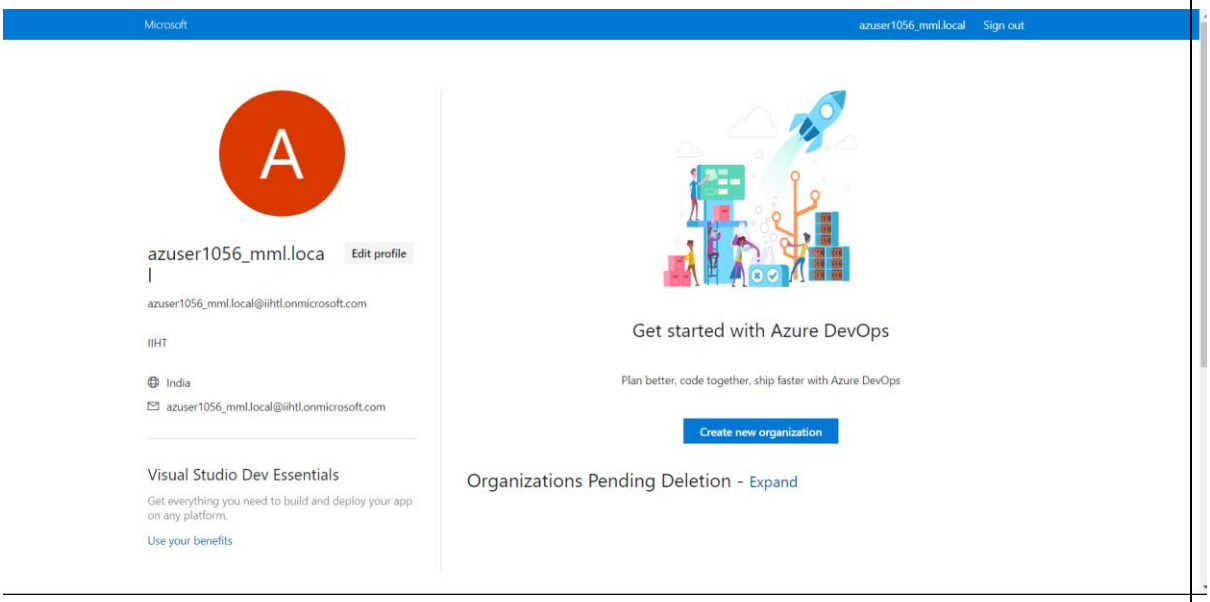
- **Spark Pools**
    - It provides the platform to perform different big data processing tasks also helps to perform different analytics
    - Users can run Spark jobs and notebooks to perform data transformations, machine learning model training, and interactive analytics.

- **Integration**
    - It supports data integration through built-in connectors, Azure Synapse Pipelines
    - We can ingest data from various sources, transform it using SQL or Spark, and load it into data warehouses or data lakes

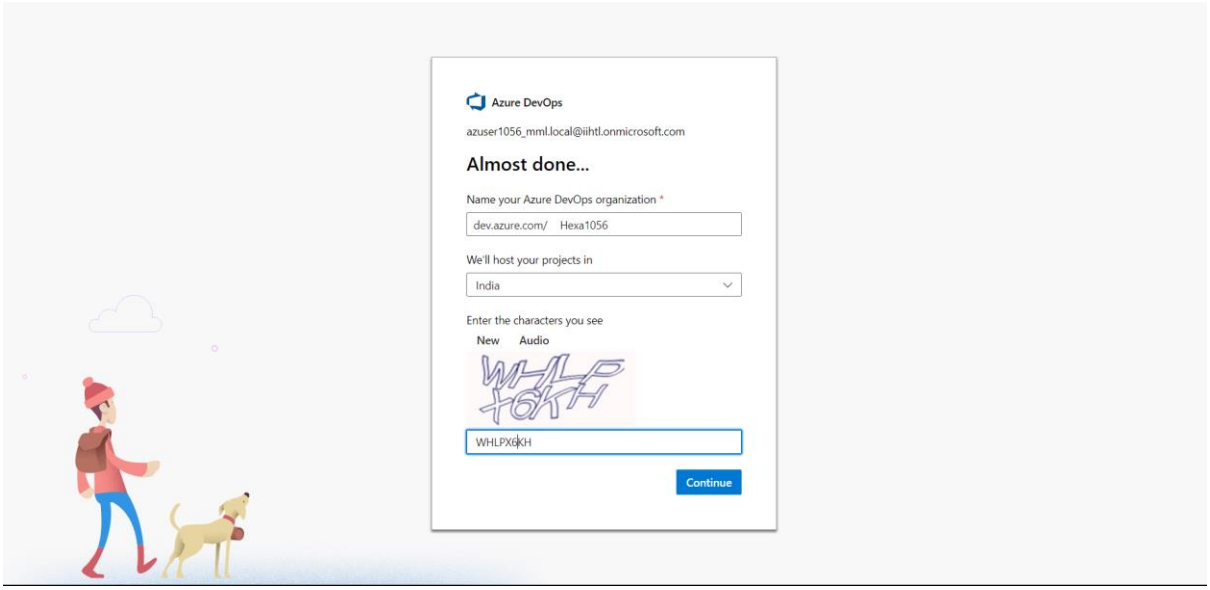
- **Integration with Other Azure Services**
    - Azure Synapse integrates with other Azure services like Azure Data Lake Storage, Azure Blob Storage
    - We can take benefits of other services with the functionalities of Azure Synapse

DevOps Environment and Clone, Push, Pull activities on Azure DevOps git and Local git

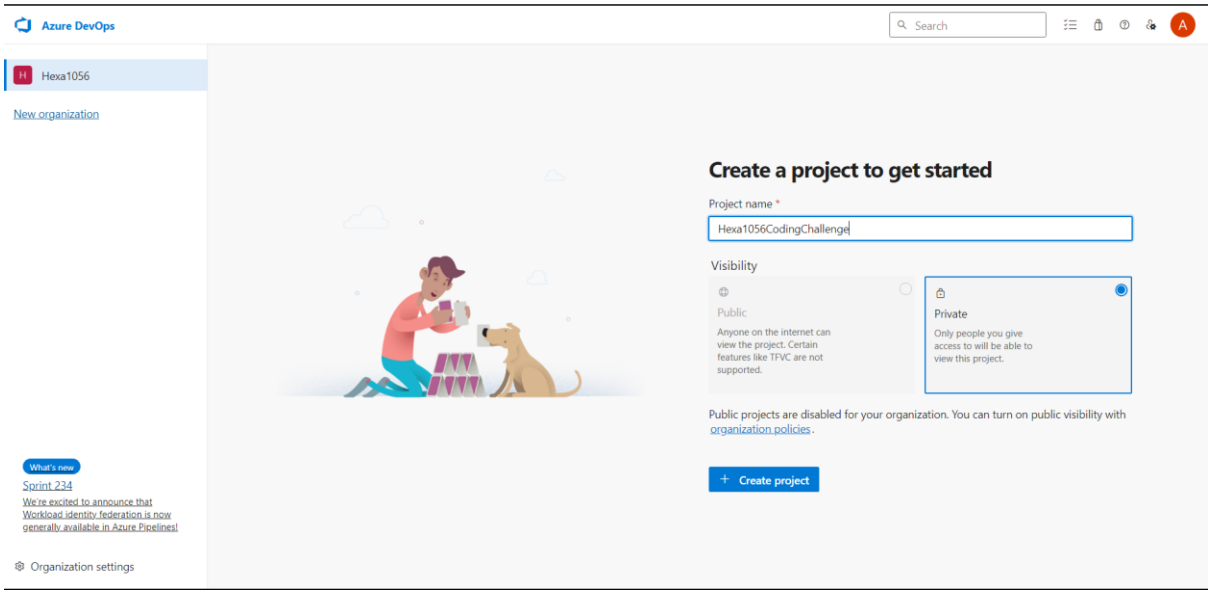
- **Creating DevOps Environment**
    - Search for DevOps Environment and Click on my organizations



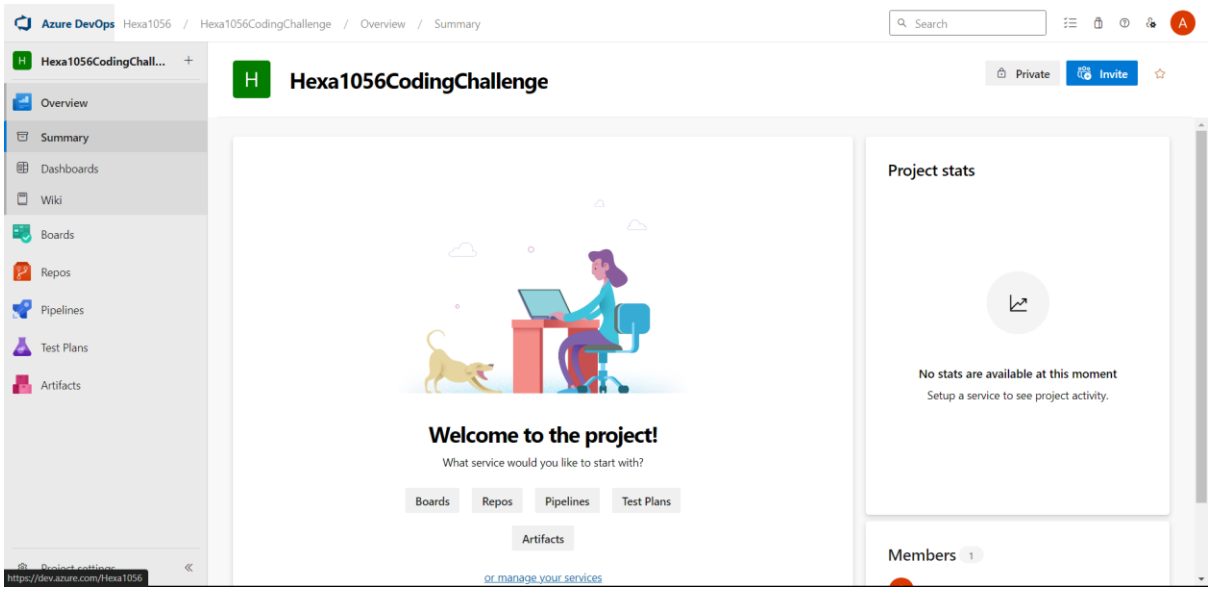
    - Click on create new organization and log in



- Create New Project

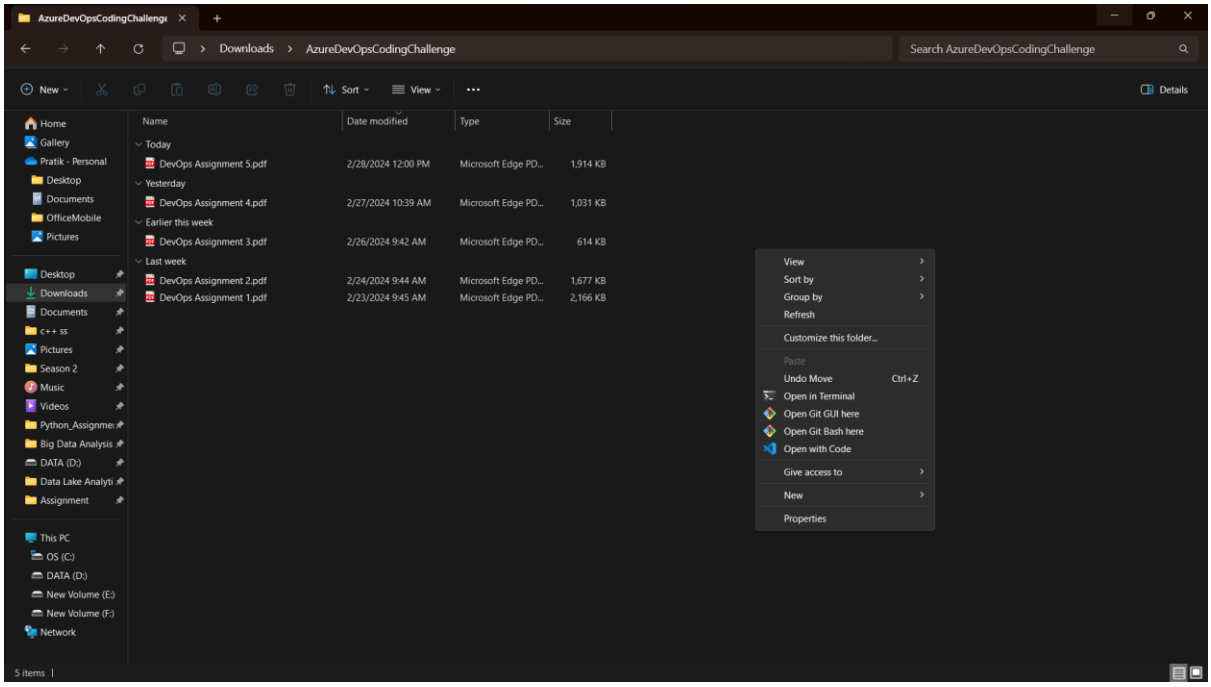


- DevOps Environment

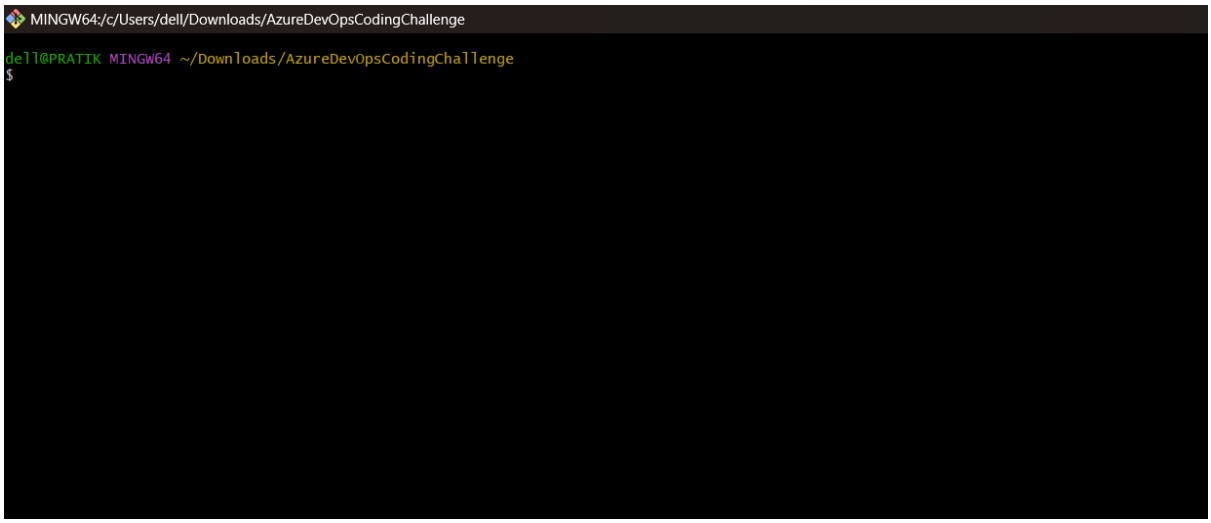


- **Git Clone**

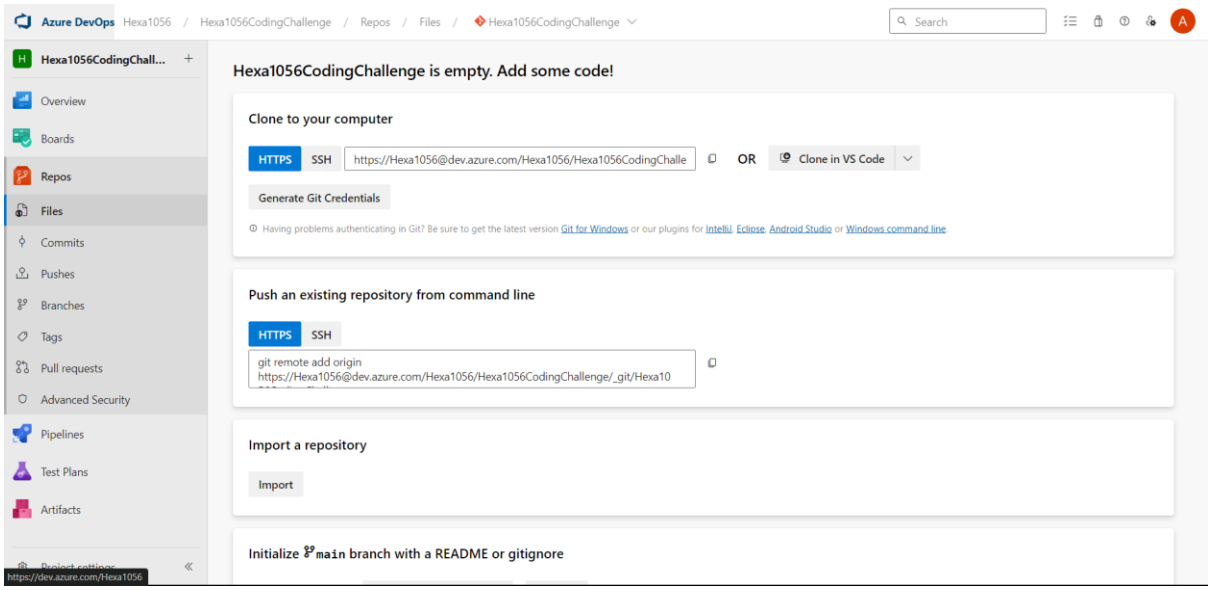
    - Go to the folder in your local which we want to clone in our azure DevOps organization



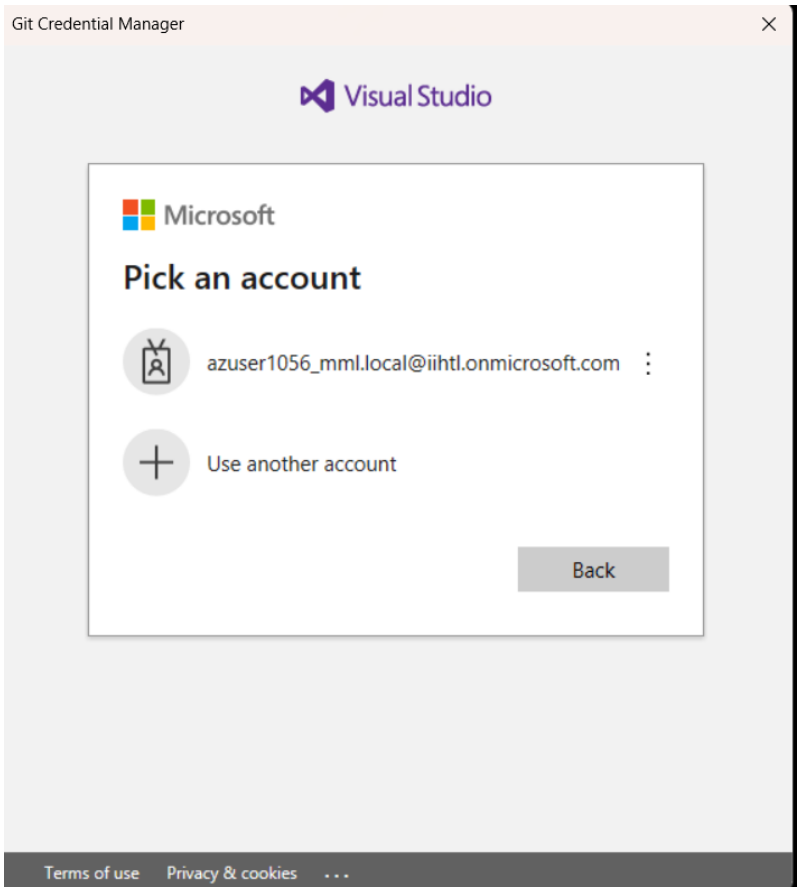
    - Open Git bash



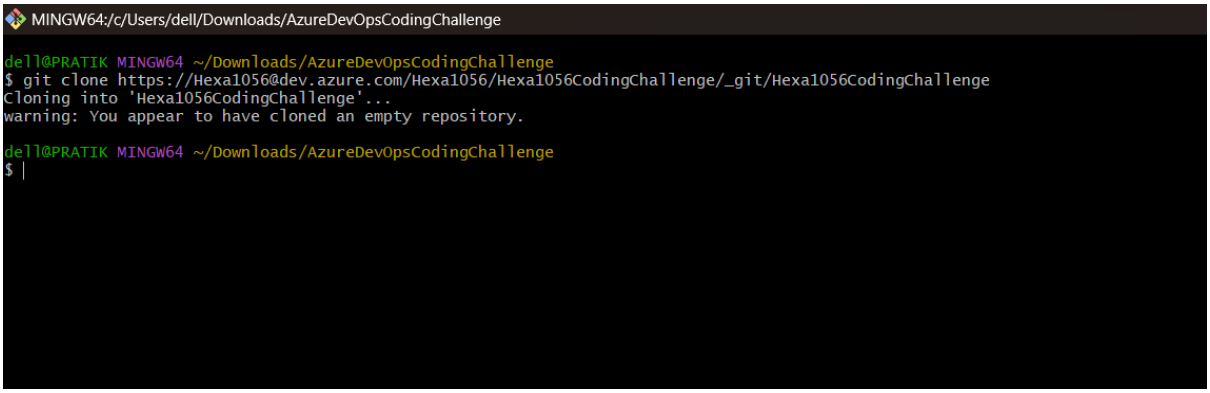
- Copy the HTTPS of our Azure Organization



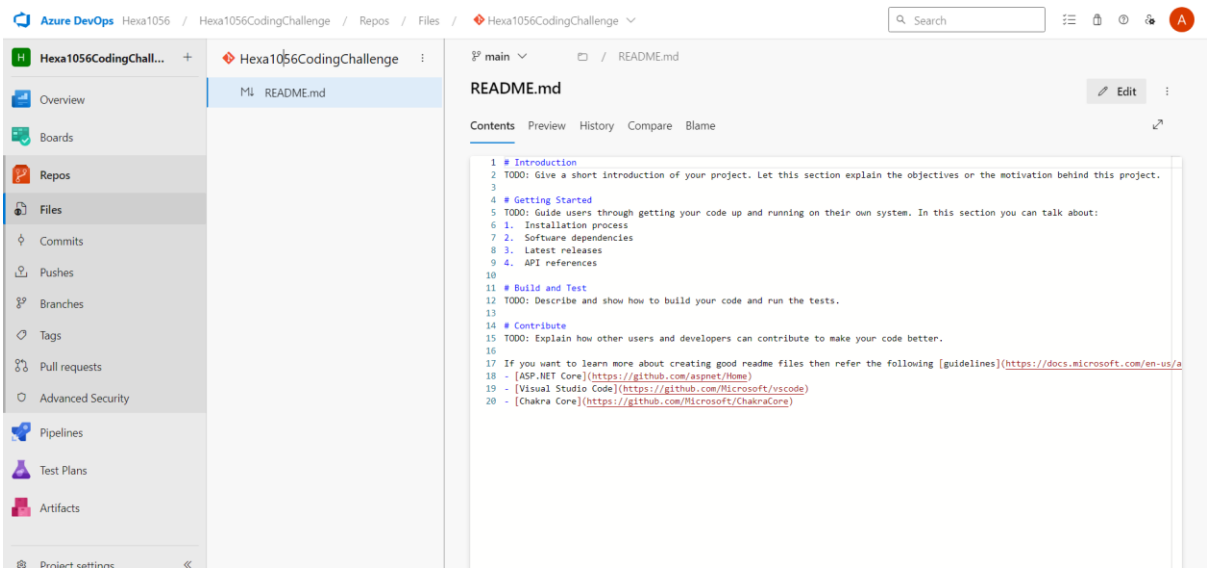
- Give command as ` git clone <HTTPS> ` and log in the git credential



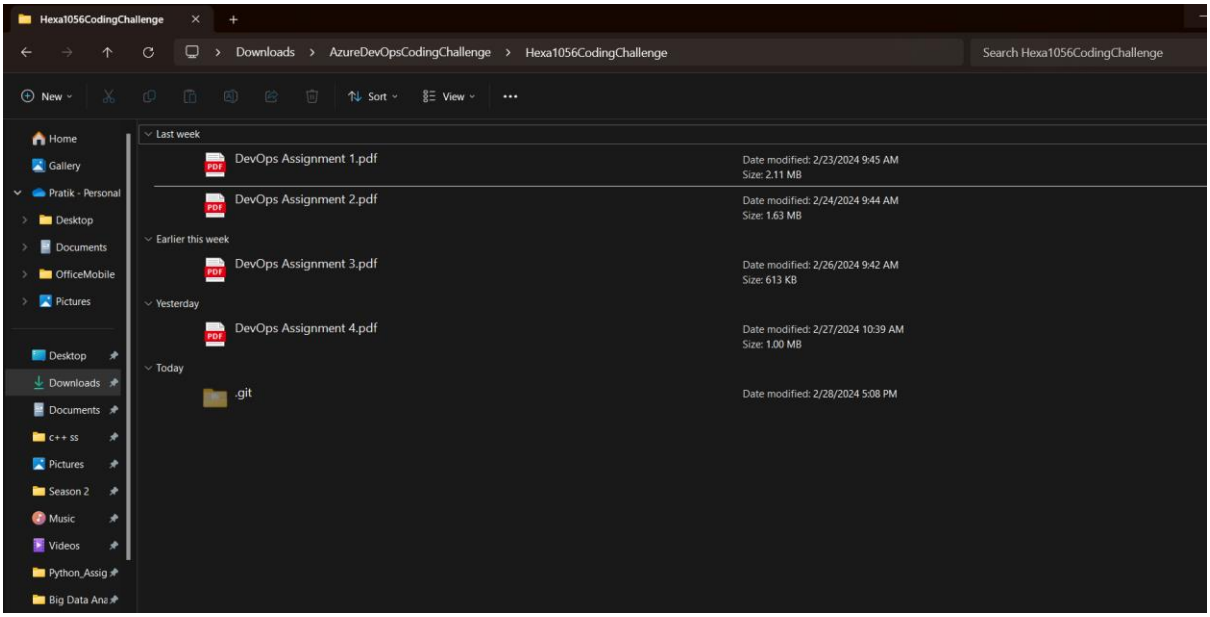
- Project cloned successfully



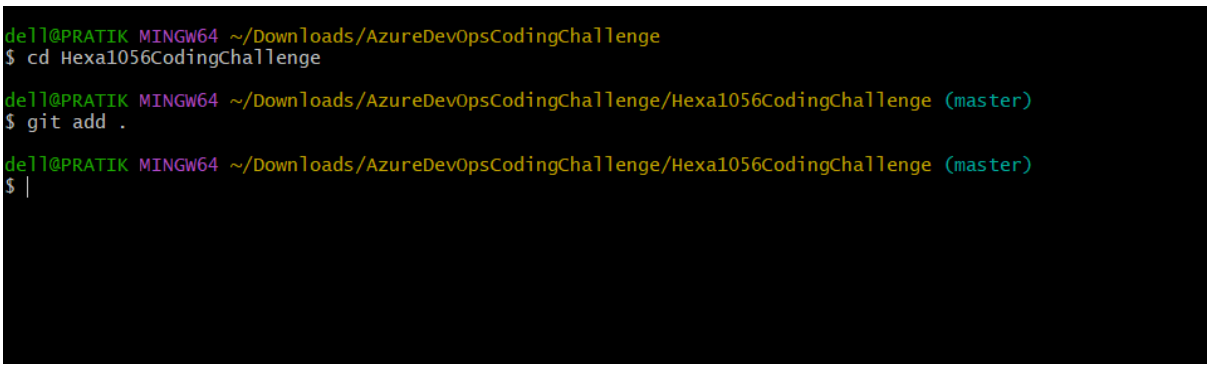
- Cloned project in DevOps Organization



- **Git Push**
    - Add some files in the cloned folder



    - Now in git bash type ` git add . ` to add the files in stage area



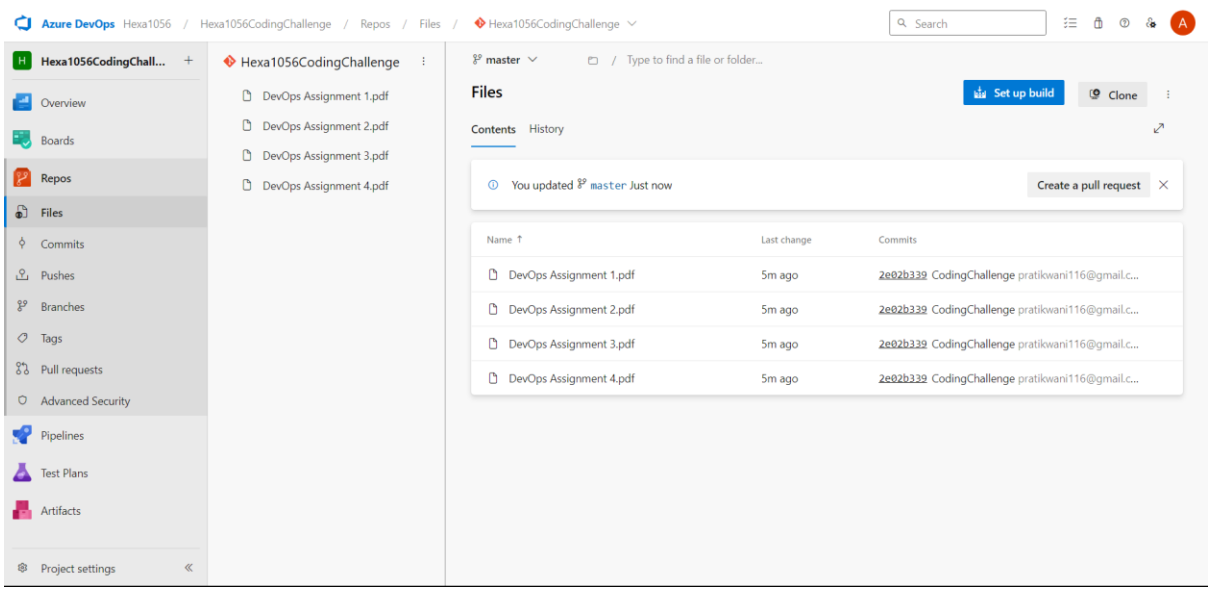
- Now Add a commit message

```
dell@PRATIK MINGW64 ~/Downloads/AzureDevOpsCodingChallenge/Hexa1056CodingChallenge (master)
$ git commit -m "CodingChallenge"
[master (root-commit) 2e02b33] CodingChallenge
 4 files changed, 0 insertions(+), 0 deletions(-)
 create mode 100644 DevOps Assignment 1.pdf
 create mode 100644 DevOps Assignment 2.pdf
 create mode 100644 DevOps Assignment 3.pdf
 create mode 100644 DevOps Assignment 4.pdf

dell@PRATIK MINGW64 ~/Downloads/AzureDevOpsCodingChallenge/Hexa1056CodingChallenge (master)
$
```

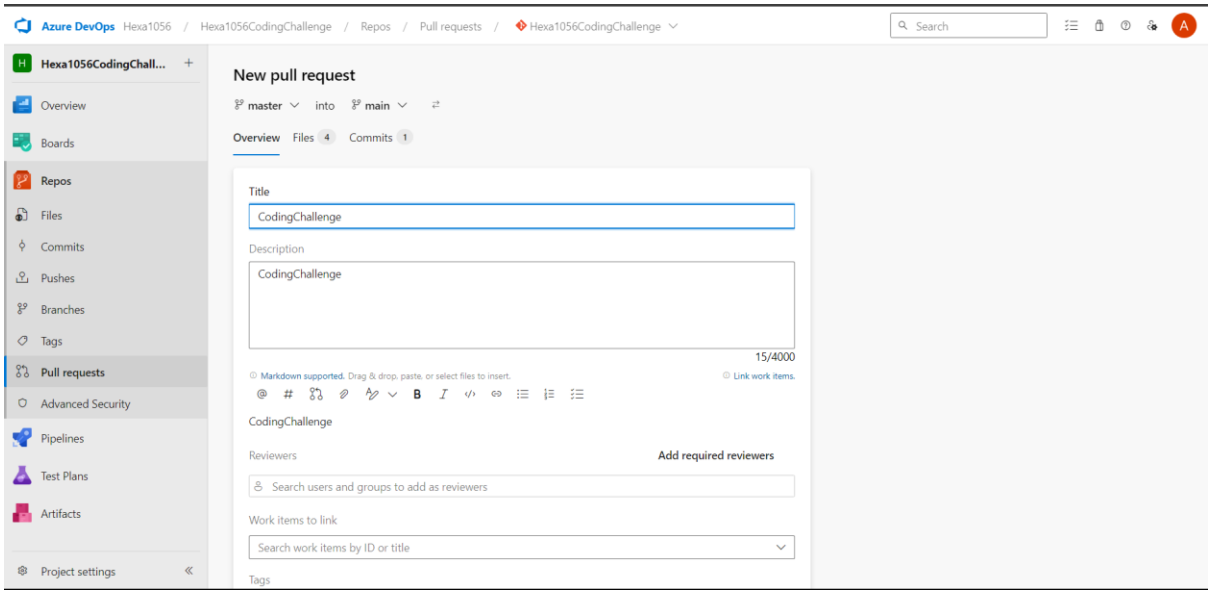
- Push the files into the repository

```
dell@PRATIK MINGW64 ~/Downloads/AzureDevOpsCodingChallenge/Hexa1056CodingChallenge (master)
$ git push origin master
Enumerating objects: 6, done.
Counting objects: 100% (6/6), done.
Delta compression using up to 8 threads
Compressing objects: 100% (6/6), done.
Writing objects: 100% (6/6), 4.73 MiB | 1.54 MiB/s, done.
Total 6 (delta 0), reused 0 (delta 0), pack-reused 0
remote: Analyzing objects... (6/6) (2471 ms)
remote: Validating commits... (1/1) done (0 ms)
remote: Storing packfile... done (136 ms)
remote: Storing index... done (44 ms)
To https://dev.azure.com/Hexa1056/Hexa1056CodingChallenge/_git/Hexa1056CodingChallenge
 * [new branch]      master -> master

dell@PRATIK MINGW64 ~/Downloads/AzureDevOpsCodingChallenge/Hexa1056CodingChallenge (master)
$
```

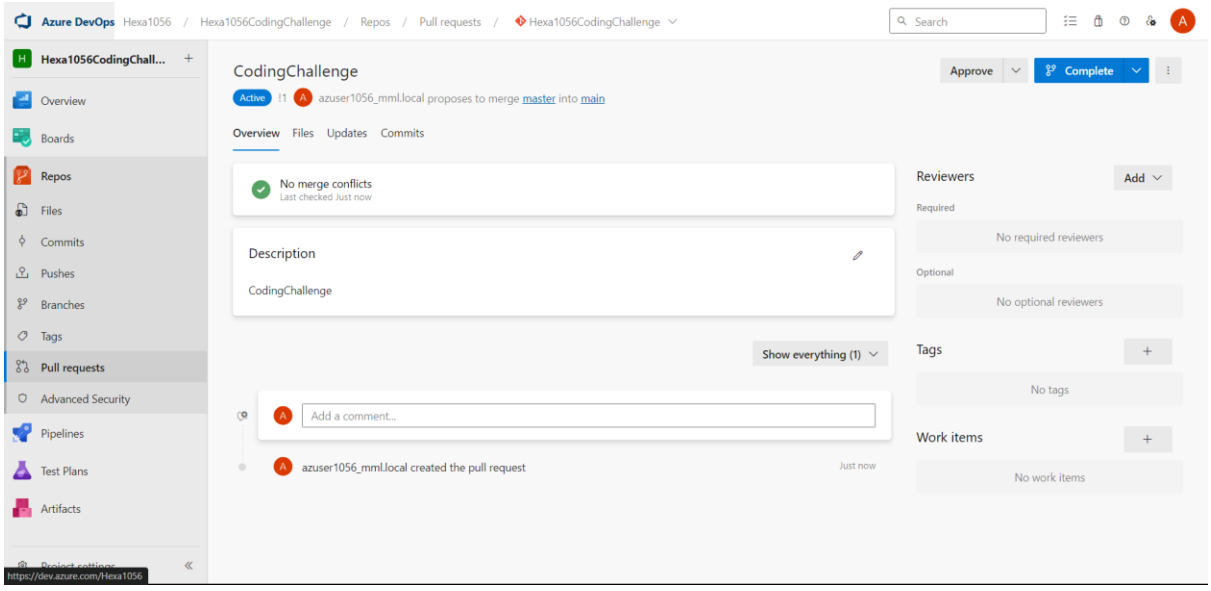
- Files successfully pushed in Master branch of DevOps organization



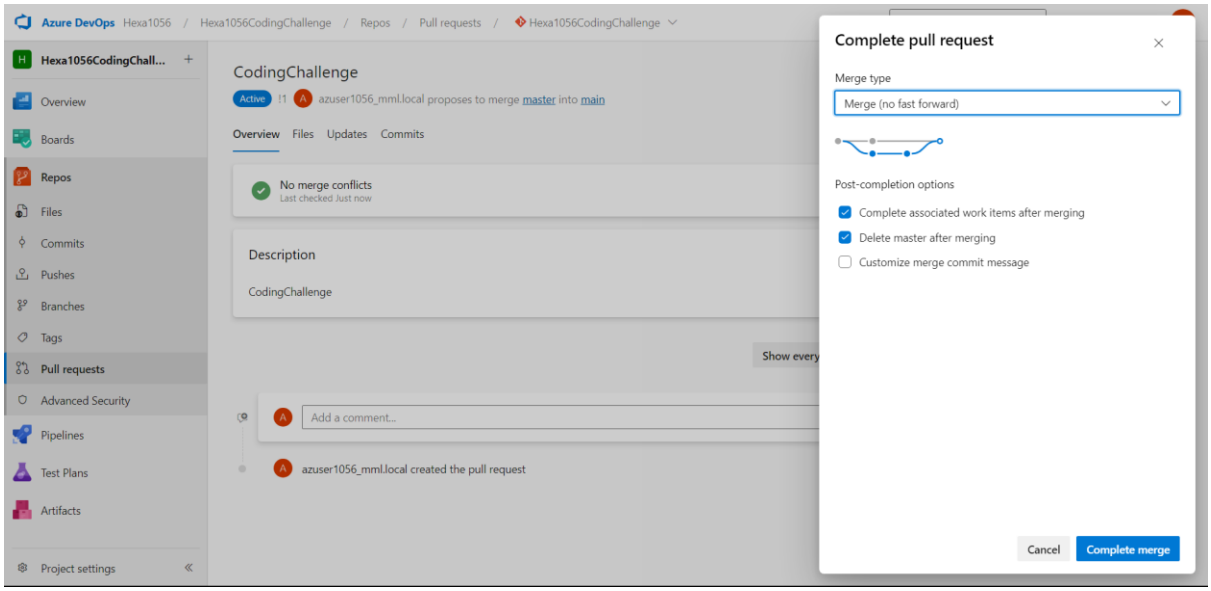
- **Git Pull**
    - Create new pull request to pull the files from master branch to main branch and click on create



    - Now click on complete



- Select Merge and complete the merge



- Files successfully pulled to main branch