DevOPS Automation:

1. **Login to Cloudshell and select Bash**
2. **Create a resource group**
   a. az group create --name myapp-rg --location eastus

3. **Create a container registry**
   a. az acr create --resource-group myapp-rg --name <YourRegistryUniqueName> --sku Basic

4. **Create a Kubernetes cluster**
   a. az aks create --resource-group myapp-rg --name myapp --node-count 1 --enable-addons monitoring --generate-ssh-keys

5. **Get repository:**

   a. Login to Github.com on Web portal

   b. **Clone** below repository to your own GIT account:

      https://github.com/sanjshah2001/sentimentanalysis.git

6. **Update ts.yaml file:**

   a. Click on ts.yaml

   b. Click Edit (Pencil Button)

   c. Change line 11 and 15 with your own registry name:

      Image: <YourRegistryUniqueName>.azure.io/timeseries

7. **Update azure-pipelines.yml**

   a. Go to line 15 and change registryname to your own unique name

      `azureContainerRegistry: <YourRegistryUniqueName>.azurecr.io`

   b. Go to line 16 and change repository name to your own repository that you cloned into

8. **Create new DevOPS project**

   a. Login to dev.azure.com

   b. Click on Create New Project with project name finservdevops

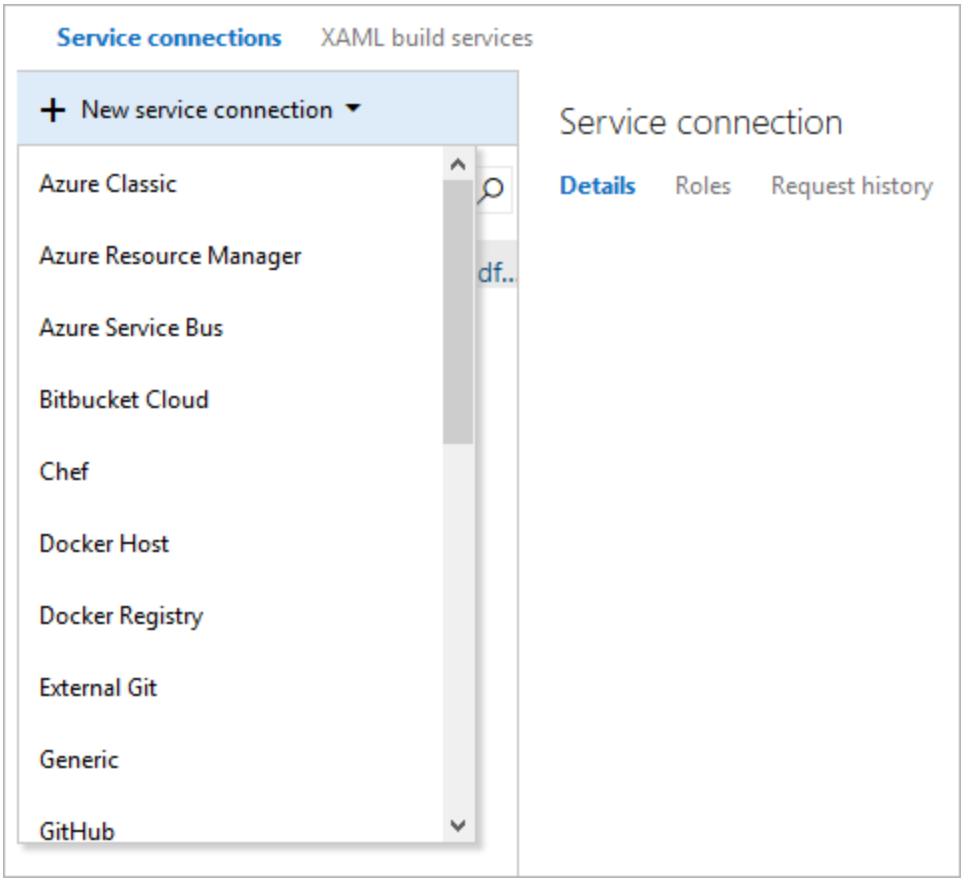
   c. Select visibility as public

   d. Click on advance

e. Make sure version control is Git and Work item process is Basic

9. Create Service End Point

a. Go to Project settings page at the bottom left
b. Choose **+ New service connection** and select **Azure Resource Manager**.



Connection Name: finservrg

Scope Level: Subscription

Subscription: Choose from drop down that you used in last exercise

Resource Group: myResourceGroup (Or name you gave in last exercise)

10. Create Build Pipeline:

a. Click on pipeline -> New pipeline

b. Select GitHub (YAML) (Not enterprise server option)

c. Select repository that you cloned earlier (Your own repository)

d. Screen will show azure-pipeline.yml file (DO NOT RUN IT YET)

e. Go to pipeline on left menu and select “Queue” on top right corner

f. Select branch as your local branch and press Queue

g. Click on “Update ts.yaml” to view progress of the build job

h. As shown, this job will:

    i. Build customized image

    ii. Tag image

    iii. Push image

    iv. Run image

    v. Copy source files on to containers

    vi. Push artifacts to the release cycle

11. Create release pipeline:

a. Click on release option on left menu

b. Select “New Pipeline”

c. Select template “Deploy to a Kubernetes cluster” and Apply

d. Select “QA” as stage name and then click save. Choose default options on pop-up window

e. Next to Artifact, click “Add”

f. Click “Build” as source type

g. Choose project name form drop down that you created during build cycle

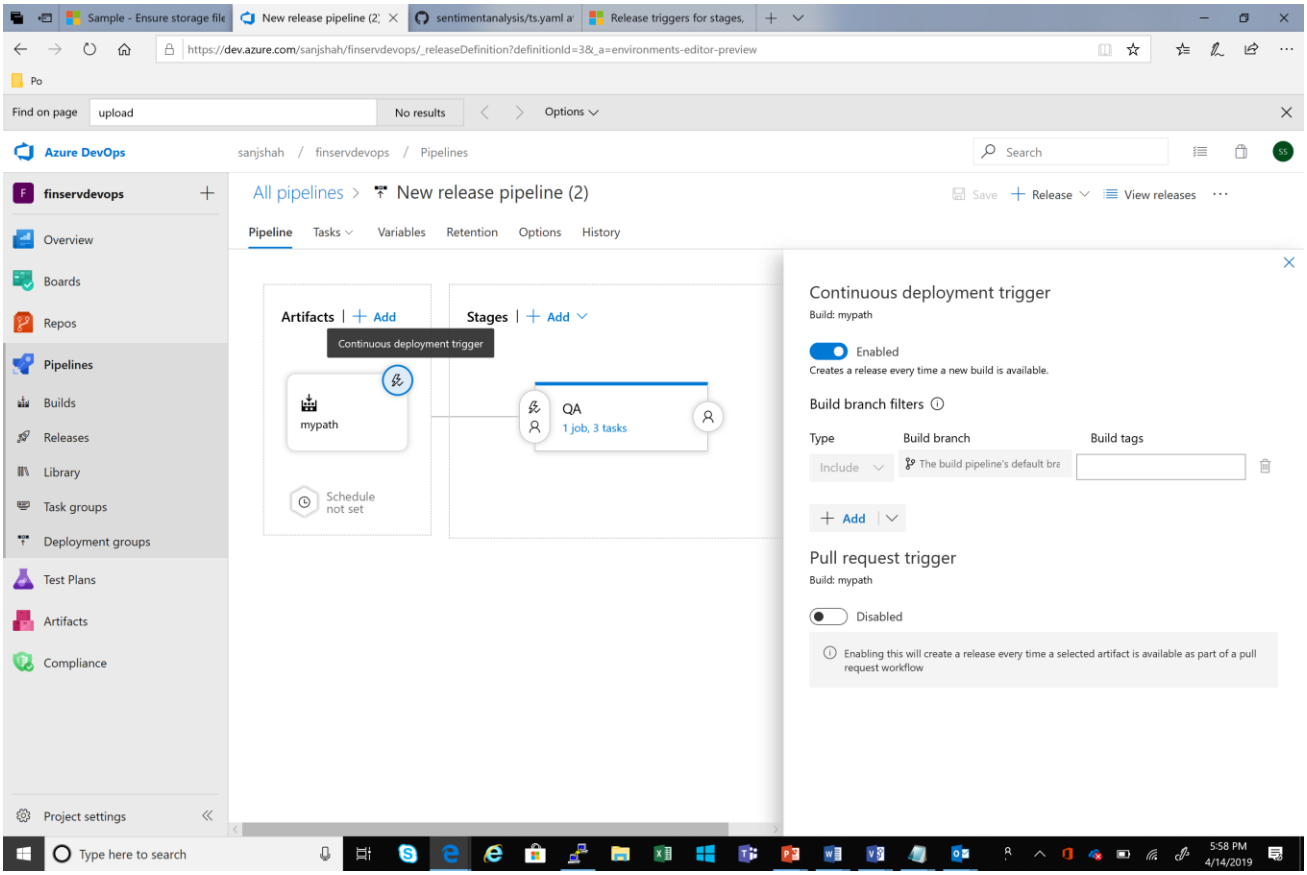
h. Select source repository from drop down as build.pipeline

i. Keep “Default” as latest version

j. Under Source Alias enter “finpath”

k. Click save

l. Click small icon on top of Artifacts box which will open up continuous deployment trigger:



m. Enable option where is says “Create a release every time new build is available”

n. Save

o. Click on “Task” from the menu on top

p. Click on Kubectl and window will open on right

q. Under Kubernetes Service connection , select “Manage”
(select “Kubernetes” from the dropdown for New Service Connection)

r. This will open another tab to create new service connection

s. Click on Add new service connection

t. Select Azure subscription

u. Give Connection Name “KubeConnection”

v. Select your subscription

w. Drop down menu will automatically find your Kubernetes cluster that you created in previous exercise

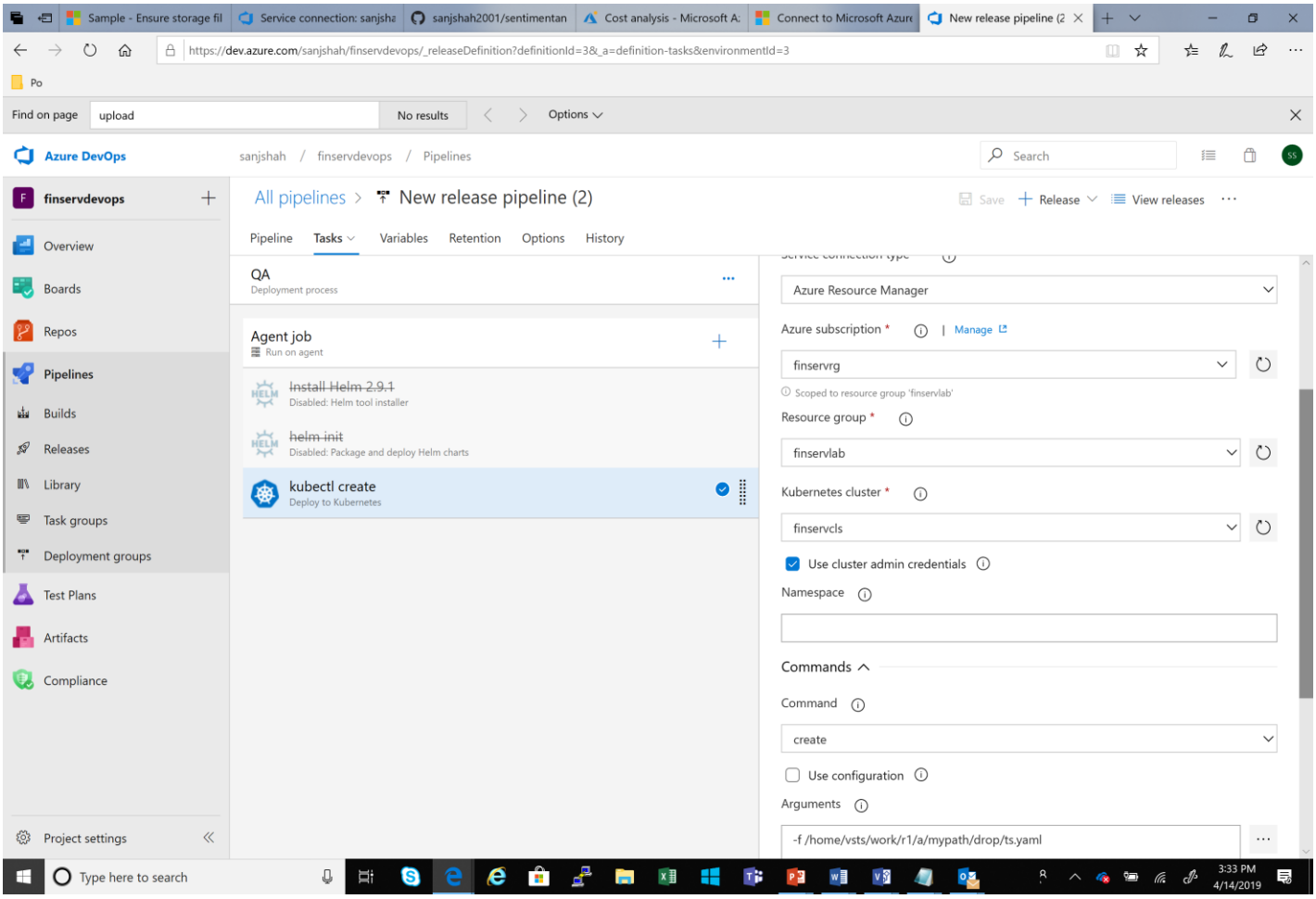
x. Select “default” as namespace

y. Click OK

z. Click on Variable task on top and add following variable:

   i. Name: imageRepoName Value: <YourRegistryUniqueName>.azurecr.io/timeseries

aa. Go back to previous window and refresh Kubernetes service connection option. Drop down will show new connection you created. Select that one



bb. Under command enter "create"

cc. Under argument enter "-f D:\a\r1\a\finpath\drop\ts.yaml"

dd. Click save

12. Test new release

a. Go to your GIT repository

b. Click on ts.yaml

c. Click Edit (Pencil Button)

d. Edit file ts.yaml and change POD name from finservpod to finservpodv2 under metadata

e. Save and commit changes

f. Go back to Azure DevOPS build pipeline, a new build would have already triggered

g. Once finished, check release pipeline, which is automatically triggered upon successful finish of build job

h. Go to Cloudshell (Bash) again

   i. az aks get-credentials --resource-group --name myapp-rg

   ii. kubectl get nodes

   iii. kubectl get pods (To ensure new POD is created)

i. If successful release, a new POD called "finservpodv2" is created, access using: kubectl exec -it finservpodv2 --container gettsdata -- /bin/bash

13. **Security and Compliance Testing (Bonus Lab)**

a. Challenge: Modify the python script to export the data files (price_data and senti_data) directly to storage accounts and ensure that file and storage account encryption is enabled for secure data storage. For secure data storage enforcement, you should use Azure Policy to enforce this on your resourcegroup. Below are some helpful links to do so:

   i. https://docs.microsoft.com/en-us/azure/governance/policy/samples/ensure-https-storage-account

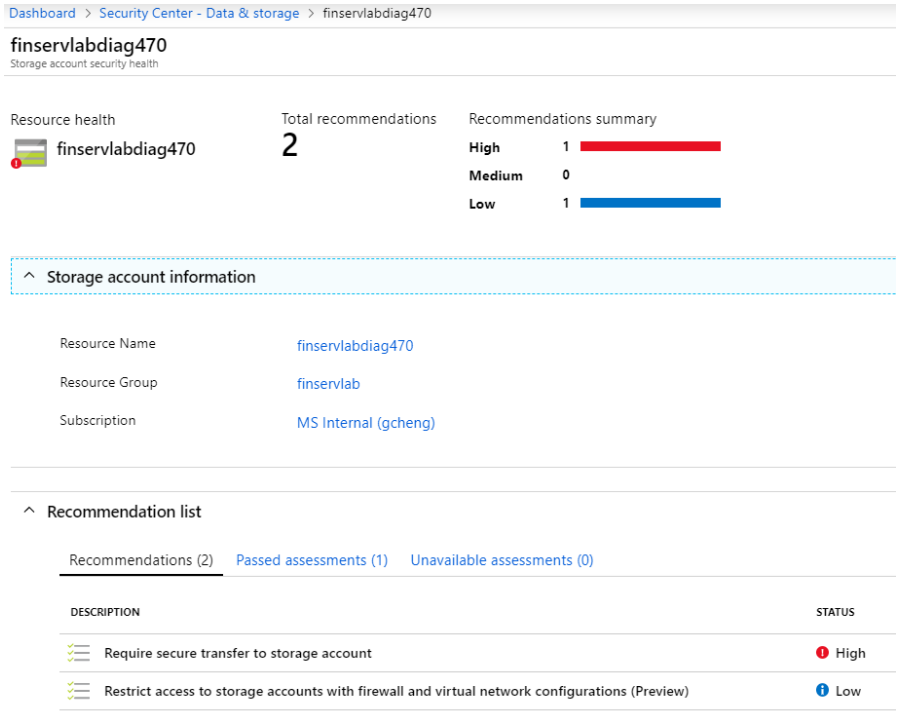
   ii. https://docs.microsoft.com/en-us/azure/governance/policy/samples/ensure-storage-file-encryption

   iii. https://docs.microsoft.com/en-us/azure/governance/policy/samples/require-storage-account-encryption

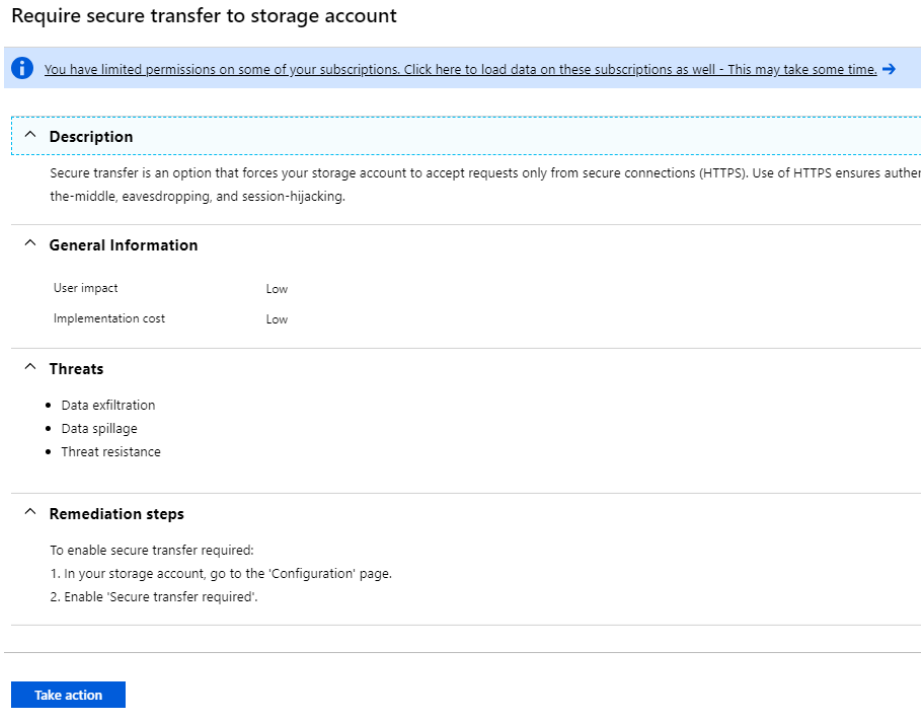
   iv. https://docs.microsoft.com/en-us/azure/governance/policy/concepts/definition-structure

b. If you have an existing storage account within Azure for this lab, once you apply the policies to the resourcegroup, you can take action on them within Azure Security Center:

   i. Example – below shows a storage account that does not meet the secure data transfer policy:



ii. If you drill down to non-compliant items, it provides remedy actions:



c. If you are interesting in exploring Azure Policy further, there is an additional hands on lab here: https://handsonlabs.microsoft.com/handsonlabs/SelfPacedLabs?storyId=story://content-private/content/sp-azuregovernance/1-azpolicy/a-policy