

CSS426 Machine Learning Operations(MLOps) Batch1

Lab 6

Automated Model Deployment Using Jenkins (CI/CD)

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Roll No: 2022BCS0152

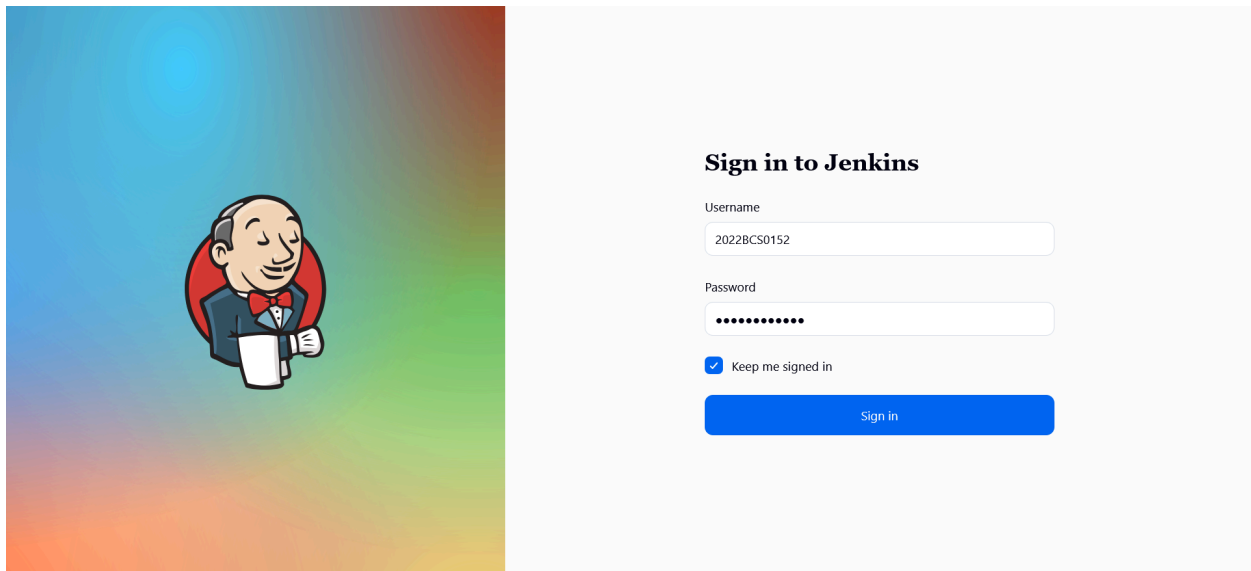
-> Github Repo Link: <https://github.com/2022bcs0152-varunbalaji/Lab-4>

-> DockerHub Repo Link : <https://hub.docker.com/r/svarunbalaji2022bcs0152/wine-api>

-> Start Docker Image:

```
PS C:\Users\VARUN BALAJI> docker start 2022bcs0152_jenkins
2022bcs0152_jenkins
PS C:\Users\VARUN BALAJI> docker ps
CONTAINER ID   IMAGE                                COMMAND                  CREATED        STATUS        PORTS
1940338e7707   2022bcs0152-jenkins                "/usr/bin/tint -- /u..." 7 days ago    Up 14 seconds  0.0.0.0:8080->8080/tcp, [::]:8080->8080/tcp, 0.0.0.0:50000->50000/tcp, [::]:50000->50000/tcp
PS C:\Users\VARUN BALAJI>
```

-> SignIn Jenkins:



-> Create Jenkinsfile :

```
pipeline {
  agent any

  environment {
    DOCKER_IMAGE = "svarunbalaji2022bcs0152/wine-api:latest"
  }

  stages {

    stage('Install Dependencies') {
      steps {
        sh '''
        python3 -m venv venv
        . venv/bin/activate
        pip install -r requirements.txt
        '''
      }
    }

    stage('Train Model') {
      steps {
        sh '''
        . venv/bin/activate
        python scripts/train.py
        echo "Name: Varun Balaji"
        echo "Roll No: 2022BCS0152"
        '''
      }
    }

    stage('Build Docker Image') {
      steps {
        sh 'docker build -t $DOCKER_IMAGE .'
      }
    }

    stage('Push to DockerHub') {
```


-> Install Dependencies/Plugins:

The screenshot shows the Jenkins 'Manage Jenkins' > 'Plugins' page. On the left, there's a sidebar with 'Updates' (4), 'Available plugins', 'Installed plugins' (selected), and 'Advanced settings'. The main area has a search bar 'Search installed plugins' and a table of installed plugins. A user menu for 'Varun Balaji' is open on the right, showing options like Theme, My Views, Account, Appearance, Preferences, Security, Experiments, Credentials, and Sign out.

Name	Health
Ant Plugin 520.vd082ecfb_16a_9 Adds Apache Ant support to Jenkins Report an issue with this plugin	96
Apache HttpComponents Client 4.x API Plugin 4.5.14-269.vfa_2321039a_83 Bundles Apache HttpComponents Client 4.x and allows it to be used by Jenkins plugins. Report an issue with this plugin	92
ASM API Plugin 9.9.1-189.vb_5ef2964da_91 This plugin provides the ASM APIs (v9.9.1) for other plugins. Report an issue with this plugin	100
Bootstrap 5 API Plugin 5.3.8-895.v4d0d8e47fea_d Provides Bootstrap 5 for Jenkins Plugins. Bootstrap is (according to their self-perception) the world's most popular front-end component library to build responsive, mobile-first projects on the web. Report an issue with this plugin	96
bouncycastle API Plugin 2.30.1.82-277.v70ca_0b_877184 This plugin provides a stable API to Bouncy Castle related tasks. Report an issue with this plugin	100
Branch API Plugin 2.1280.v0d4e5b_b_460ef This plugin provides an API for multiple branch based projects. Report an issue with this plugin	100

-> Create New Pipeline:

The screenshot shows the Jenkins 'New Item' page. The breadcrumb is 'Jenkins / All / New Item'. There's a text input 'Enter an item name' with the value '2022BCS0152-VarunBalaji'. Below it, 'Select an item type' shows four options: Pipeline (selected), Freestyle project, Multi-configuration project, and Folder. A 'Multibranch Pipeline' section is partially visible with an 'OK' button. At the bottom right, it says 'REST API Jenkins 2.541.1'.

New Item

Enter an item name
2022BCS0152-VarunBalaji

Select an item type

- Pipeline**
Build, test, and deploy using pipelines. Supports stages, parallel work, and running on multiple agents.
- Freestyle project**
Classic, general-purpose job type that checks out from up to one SCM, executes build steps serially, followed by post-build steps like archiving artifacts and sending email notifications.
- Multi-configuration project**
Suitable for projects that need a large number of different configurations, such as testing on multiple environments, platform-specific builds, etc.
- Folder**
Creates a container that stores nested items in it. Useful for grouping things together. Unlike view, which is just a filter, a folder creates a separate namespace, so you can have multiple things of the same name as long as they are in different folders.

Multibranch Pipeline
Creates a set of Pipeline projects according to detected branches in one SCM repository.
OK

Organization Folder
Creates a set of multibranch project subfolders by scanning for repositories.

REST API Jenkins 2.541.1

← → ↻ http://localhost:8080/view/job/2022BCS0152-VarunBalaji/configure

Internet Speed Test | F... Documents - OneDrive Gmail ChatGPT (204) YouTube Lms Dashboard Claude Perplexity Qwen Not Diamond | The las... Flee | Outpass Portal IIITKottayam Authent... HPC Access (IIITK) >>

Jenkins / All / 2022BCS0152-VarunBalaji / Configure

Configure

- General
- Triggers
- Pipeline**
- Advanced

Pipeline

Define your Pipeline using Groovy directly or pull it from source control.

Definition

Pipeline script from SCM

SCM ?

Git

Repositories ?

Repository URL ?

https://github.com/2022bcs0152-varunbalaji/Lab-4.git

Credentials ?

- none - + Add

Advanced ▾

Save Apply

http://localhost:8080/user/2022bcs0152

Varun Balaji

- Theme Light
- My Views
- Account
- Appearance
- Preferences
- Security
- Experiments
- Credentials
- Sign out

← → ↻ http://localhost:8080/view/job/2022BCS0152-VarunBalaji/configure

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Jenkins / All / 2022BCS0152-VarunBalaji / Configure

Configure

- General
- Triggers
- Pipeline**
- Advanced

Branches to build ?

Branch Specifier (blank for 'any') ?

*/main

+ Add Branch

Repository browser ?

(Auto)

Additional Behaviours

+ Add

Script Path ?

Jenkinsfile

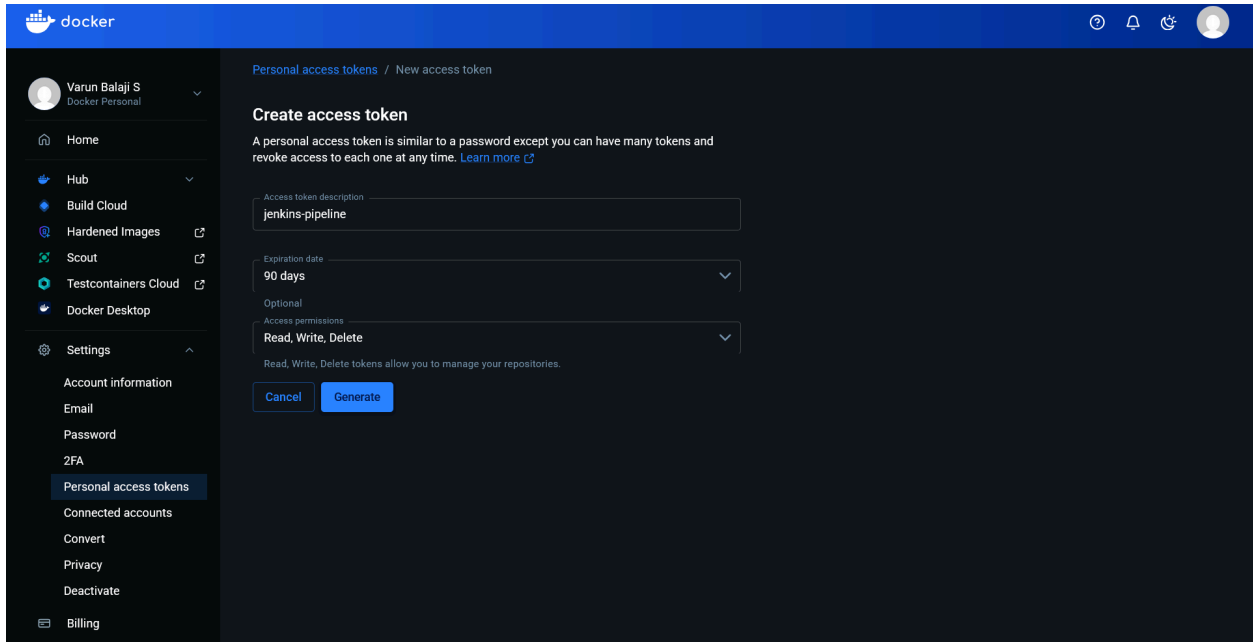
Save Apply

http://localhost:8080/user/2022bcs0152

Varun Balaji

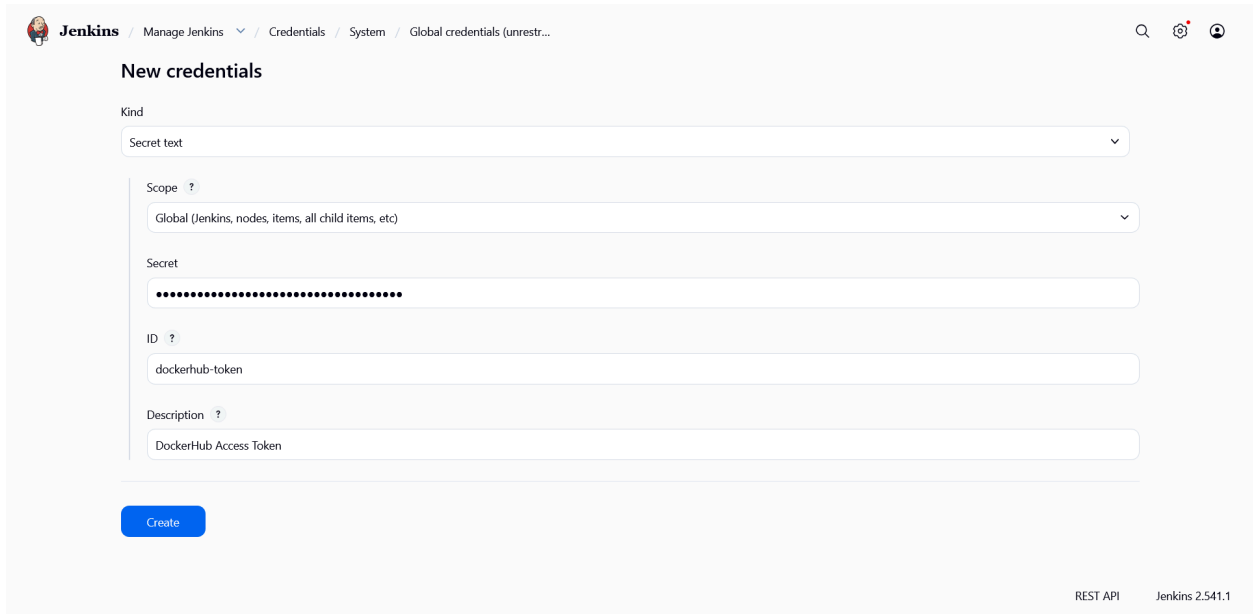
- Theme Light
- My Views
- Account
- Appearance
- Preferences
- Security
- Experiments
- Credentials
- Sign out

-> Create Access Token in Docker :



The screenshot shows the Docker Personal access tokens page. The left sidebar contains the user profile 'Varun Balaji S' and a menu with options: Home, Hub, Build Cloud, Hardened Images, Scout, Testcontainers Cloud, Docker Desktop, Settings, Account information, Email, Password, 2FA, Personal access tokens (selected), Connected accounts, Convert, Privacy, Deactivate, and Billing. The main content area is titled 'Personal access tokens / New access token' and 'Create access token'. It includes a description of a personal access token, a form to create a new token with fields for 'Access token description' (filled with 'jenkins-pipeline'), 'Expiration date' (set to '90 days'), and 'Access permissions' (set to 'Read, Write, Delete'). There are 'Cancel' and 'Generate' buttons at the bottom of the form.

-> Add new Global Credentials :



The screenshot shows the Jenkins 'New credentials' form. The breadcrumb navigation at the top is 'Jenkins / Manage Jenkins / Credentials / System / Global credentials (unrestr...)'. The form has the following fields: 'Kind' (set to 'Secret text'), 'Scope' (set to 'Global (Jenkins, nodes, items, all child items, etc)'), 'Secret' (a masked field with dots), 'ID' (set to 'dockerhub-token'), and 'Description' (set to 'DockerHub Access Token'). A 'Create' button is at the bottom left. The footer shows 'REST API' and 'Jenkins 2.541.1'.

-> Build and Run Jenkins Pipeline:

Jenkins / 2022BCS0152-VarunBalaji / #4 / Stages

✓ < #4 Rerun ⚙️

Started by Varun Balaji Started 15 sec ago Queued 2 ms Build has been executing for 15 sec

Graph

Start Checkout SCM Install Dependencies Train Model Build Docker Image Push to DockerHub End

Search

- ✓ Checkout SCM 2s
- ✓ Install Dependencies 1s
- ✓ Train Model 3s
- ✓ Build Docker Image 4s
- ✓ Push to DockerHub 11m

✓ Checkout SCM 2s Started 15m ago Jenkins

✓ Check out from version control > 2s

Jenkins 2.541.1

Jenkins / 2022BCS0152-VarunBalaji / #4 / Stages

✓ < #4 Rerun ⚙️

Started by Varun Balaji Started 15 sec ago Queued 2 ms Build has been executing for 15 sec

Graph

Start Checkout SCM Install Dependencies Train Model Build Docker Image Push to DockerHub End

Search

- ✓ Checkout SCM 2s
- ✓ Install Dependencies 1s
- ✓ Train Model 3s
- ✓ Build Docker Image 4s
- ✓ Push to DockerHub 11m

✓ Install Dependencies 1s Started 15m ago Jenkins

✓ python3 -m venv venv . venv/bin/activate pip install -r requirements.txt > 1s

Jenkins

2022BCS0152-VarunBalaji

#4

Stages

Started by Varun Balaji

Started 15 sec ago

Queued 2 ms

Build has been executing for 15 sec

Graph

Start

Checkout SCM

Install Dependencies

Train Model

Build Docker Image

Push to DockerHub

End

Search

Train Model

3s

Started 16m ago

Jenkins

...

Checkout SCM 2s

Install Dependencies 1s

Train Model 3s

Build Docker Image 4s

Push to DockerHub 11m

.venv/bin/activate python scripts/train.py echo "Name: Varun Balaji" echo "Roll No: 2022BCS0152" >

3s

Jenkins

2022BCS0152-VarunBalaji

#4

Stages

Started by Varun Balaji

Started 15 sec ago

Queued 2 ms

Build has been executing for 15 sec

Graph

Start

Checkout SCM

Install Dependencies

Train Model

Build Docker Image

Push to DockerHub

End

Search

Build Docker Image

4s

Started 16m ago

Jenkins

...

Checkout SCM 2s

Install Dependencies 1s

Train Model 3s

Build Docker Image 4s

Push to DockerHub 11m

docker build -t \$DOCKER_IMAGE . >

4s

Jenkins

2022BCS0152-VarunBalaji

#4

Stages

Started by Varun Balaji

Started 15 sec ago

Queued 2 ms

Build has been executing for 15 sec

Graph

Start

Checkout SCM

Install Dependencies

Train Model

Build Docker Image

Push to DockerHub

End

Search

Push to DockerHub

11m

Started 16m ago

Jenkins

...

Checkout SCM 2s

Install Dependencies 1s

Train Model 3s

Build Docker Image 4s

Push to DockerHub 11m

echo \$DOCKER_PASS | docker login -u svarunbalaji2022bcs0152 --password-stdin docker push \$DOCKER_IMAGE >

11m

0 + echo ****

1 + docker login -u svarunbalaji2022bcs0152 --password-stdin

2 WARNING! Your password will be stored unencrypted in /root/.docker/config.json.

3 Configure a credential helper to remove this warning. See

4 <https://docs.docker.com/engine/reference/commandline/login/#credentials-store>

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