

# **SKILL DEVELOPMENT-NOV-2024 report by Kaushal kumar(4NI22CS094)**

## **Report on Jenkins, Docker, and Kubernetes Training**

### **Day 1: Installation and Setup**

- **Jenkins** : Installed and configured Jenkins, set up user roles, and explored the dashboard.
- **Docker** : Installed Docker, configured settings, and verified the installation.

### **Day 2: Jenkins Basics**

- Concepts Covered:
- Fundamentals of Continuous Integration (CI) and Continuous Deployment (CD).
- Key Jenkins Commands and Practicals:
- Creating and Managing Jobs: Configured automated build jobs. - Build Triggers: Set up webhook triggers from GitHub for builds.
- Pipeline Basics: Created a simple pipeline using Jenkinsfile syntax.

### **Day 3: Docker Basics and Commands**

- Concepts Covered: - Core Docker concepts, including images, containers, volumes, and networking.
- Key Docker Commands and Practicals:
- Container Operations:
- `docker run -d --name CONTAINER_NAME IMAGE_NAME``:  
Run a container in detached mode.
- `docker exec -it CONTAINER_NAME /bin/bash``: Access a running container. - `docker logs CONTAINER_ID``: Check logs of a container.
- Image Management: - `docker build -t IMAGE_NAME .``: Build an image from a Dockerfile.
- `docker push IMAGE_NAME``: Push an image to Docker Hub.

- Volume and Network Commands:
- `docker volume create VOLUME_NAME``: Create a persistent volume.
- `docker network create NETWORK_NAME``: Create a custom container network.
- Practical Exercise: Built a web application Docker image, ran it as a container, and managed volumes and networks.

#### **Day 4: Basic Kubernetes Integration with Docker**

- Concepts Covered: - Introduction to Kubernetes and container orchestration. - Basics of deploying Docker containers in a Kubernetes cluster.

- Key Kubernetes Commands and Practicals:

- Container Deployment:

- `kubectl create deployment DEPLOYMENT_NAME --image=IMAGE_NAME` : Deploy a Docker container in Kubernetes. - `kubectl get pods` : List all running pods in the cluster.

- `kubectl logs POD_NAME`: View logs of a specific pod. - `kubectl expose deployment DEPLOYMENT_NAME --type=LoadBalancer --port=PORT`` : Expose the deployment to make it accessible externally.

- Service and Scaling Commands:

- `kubectl scale deployment DEPLOYMENT_NAME --replicas=NUMBER``: Scale the number of replicas. - `kubectl get services` : List all services in the cluster. -

Practical Exercise:

Deployed a Docker containerized application to Kubernetes, exposed it as a service, and scaled replicas to handle increased load.

# DOCKER

The screenshot shows the Docker Desktop interface. The left sidebar contains navigation options: Containers, Images (selected), Volumes, Builds, Docker Scout, and Extensions. The main area is titled 'Images' and shows a 'Local' tab with a progress bar indicating 3.02 GB / 9.13 GB in use and 32 images. Below this is a search bar and a table of images.

Name	Tag	Status	Created	Size	Actions
mynewimage	1.0	In use	3 days ago	279.16 MB	[Play] [More] [Delete]
myapp	1.0	In use	3 days ago	1.61 GB	[Play] [More] [Delete]
kaushal314/getting-started	latest	In use	3 days ago	1.61 GB	[Play] [More] [Delete]

Below the table is a 'Terminal' window showing PowerShell commands and output:

```
Windows PowerShell
Copyright (C) Microsoft Corporation. All rights reserved.

Install the latest PowerShell for new features and improvements! https://aka.ms/PSWindows

PS C:\Users\kaush> cd getting-started-todo-app-main
```

The bottom status bar shows 'Engine running', 'Kubernetes running', RAM usage (6.41 GB / 3.25%), and disk space (1009.47 GB / 1081.10 GB). The system tray at the bottom shows the date and time (12:16 PM, 11/9/2024).

This screenshot is similar to the first one, but the terminal window shows an additional command:

```
PS C:\Users\kaush> cd getting-started-todo-app-main
PS C:\Users\kaush\getting-started-todo-app-main> docker compose watch
```

The status bar at the bottom shows updated RAM usage (6.43 GB / 4.72%) and the same disk space information. The system tray shows the date and time (12:17 PM, 11/9/2024).

Containers

Images

Volumes

Builds

Docker Scout

Extensions

Search for images, containers, volumes, extensions... **Ctrl+K**

Images

Give feedback

4.6 GB / 9.13 GB in use 32 images

Last refresh: 60 minutes ago

Search

<input type="checkbox"/>	Name	Tag	Status	Created	Size	Actions
<input type="checkbox"/>	skate/wuolama					

Terminal

+ - x

```
=> => exporting attestation manifest sha256:52f129e8bd65564c964d931129881cbe2fcd3a9ec4a1b85182ab1f3d0c19fc36
=> => exporting manifest list sha256:75eb57a8d3515d7c27445dc1609c62e6a1f732c1aa73f14997735fcef93b46ee
=> => naming to docker.io/library/getting-started-todo-app-main-backend:latest
=> => unpacking to docker.io/library/getting-started-todo-app-main-backend:latest
=> CACHED [client client-base 1/5] COPY client/package.json client/yarn.lock ./
=> CACHED [client client-base 2/5] RUN --mount=type=cache,id=yarn,target=/usr/local/share/.cache/yarn yarn install
=> CACHED [client client-base 3/5] COPY client/.eslintrc.cjs client/index.html client/vite.config.js ./
=> CACHED [client client-base 4/5] COPY client/public ./public
=> CACHED [client client-base 5/5] COPY client/src ./src
[+] Running 6/6
✔ Network getting-started-todo-app-main_default Created 0.1s
✔ Container getting-started-todo-app-main-mysql-1 Started 1.4s
✔ Container getting-started-todo-app-main-client-1 Started 2.2s
✔ Container getting-started-todo-app-main-backend-1 Started 2.2s
✔ Container getting-started-todo-app-main-proxy-1 Started 2.3s
✔ Container getting-started-todo-app-main-phpmyadmin-1 Started 2.2s
Watch enabled
```

Windows Pow... x

Engine running

Kubernetes running RAM 7.15 GB CPU 0.62% Disk 1009.45 GB avail. of 1081.10 GB

Terminal v4.35.1 16

Containers

Images

Volumes

Builds

Docker Scout

Extensions

Search for images, containers, volumes, extensions... **Ctrl+K**

Images

Give feedback

4.6 GB / 9.13 GB in use 32 images

Last refresh: 1 hour ago

Search

<input type="checkbox"/>	Name	Tag	Status	Created	Size	Actions
<input type="checkbox"/>	gcr.io/k8s-minikube/kicbas	<none>	In use (dangling)	2 months ago	1.81 GB	<div></div> <div></div> <div></div>
<input type="checkbox"/>	getting-started-todo-app-n	latest	In use	2 days ago	1.74 GB	<div></div> <div></div> <div></div>
<input type="checkbox"/>	getting-started-todo-app-n	latest	In use	3 days ago	1.69 GB	<div></div> <div></div> <div></div>

Showing 32 items

Terminal

+ - x

```
[+] Running 6/6
✔ Network getting-started-todo-app-main_default Created 0.1s
✔ Container getting-started-todo-app-main-mysql-1 Started 1.4s
✔ Container getting-started-todo-app-main-client-1 Started 2.2s
✔ Container getting-started-todo-app-main-backend-1 Started 2.2s
✔ Container getting-started-todo-app-main-proxy-1 Started 2.3s
✔ Container getting-started-todo-app-main-phpmyadmin-1 Started 2.2s
Watch enabled
```

Windows Pow... x

Engine running

Kubernetes running RAM 7.27 GB CPU 5.71% Disk 1009.45 GB avail. of 1081.10 GB

Terminal v4.35.1 16

Containers

Images

Volumes

Builds

Docker Scout

Extensions

Search for images, containers, volumes, extensions... Ctrl+K

Images

Give feedback

4.6 GB / 9.13 GB in use 32 Images

Last refresh: 1 hour ago

Search

Name

gcr.io/k8s-minikube/

81df28859520

getting-started-todo-

c84bcb7a0da

getting-started-todo-

75eb57a8d351

Created

Size

Actions

(dangling)

2 months ago

1.81 GB

2 days ago

1.74 GB

3 days ago

1.69 GB

Showing 32 items

Terminal

[+] Running 6/6

✓ Network getting-started-todo-app-main\_default Created

✓ Container getting-started-todo-app-main-mysql-1 Started

✓ Container getting-started-todo-app-main-client-1 Started

✓ Container getting-started-todo-app-main-backend-1 Started

✓ Container getting-started-todo-app-main-proxy-1 Started

✓ Container getting-started-todo-app-main-phpmyadmin-1 Started

Watch enabled

Engine running | Kubernetes running RAM 7.14 GB CPU 12.24% Disk 1009.45 GB avail. of 1081.10 GB

78° | Search | 12:22 PM 11/9/2024

Containers

Images

Volumes

Builds

Docker Scout

Extensions

Search for images, containers, volumes, extensions... Ctrl+K

Containers

Give feedback

Container CPU usage ⓘ  
0.99% / 1600% (16 CPUs available)

Container memory usage ⓘ  
857.71 MB / 7.29 GB

Show charts

Q sha256:c84bcb7a0da43bfe29900i

Only show running containers

Name

getting-started-todo-app-

main

Running (7/7)

0%

16 seconds ago

Terminal

[+] Running 6/6

✓ Network getting-started-todo-app-main\_default Created

✓ Container getting-started-todo-app-main-mysql-1 Started

✓ Container getting-started-todo-app-main-client-1 Started

✓ Container getting-started-todo-app-main-backend-1 Started

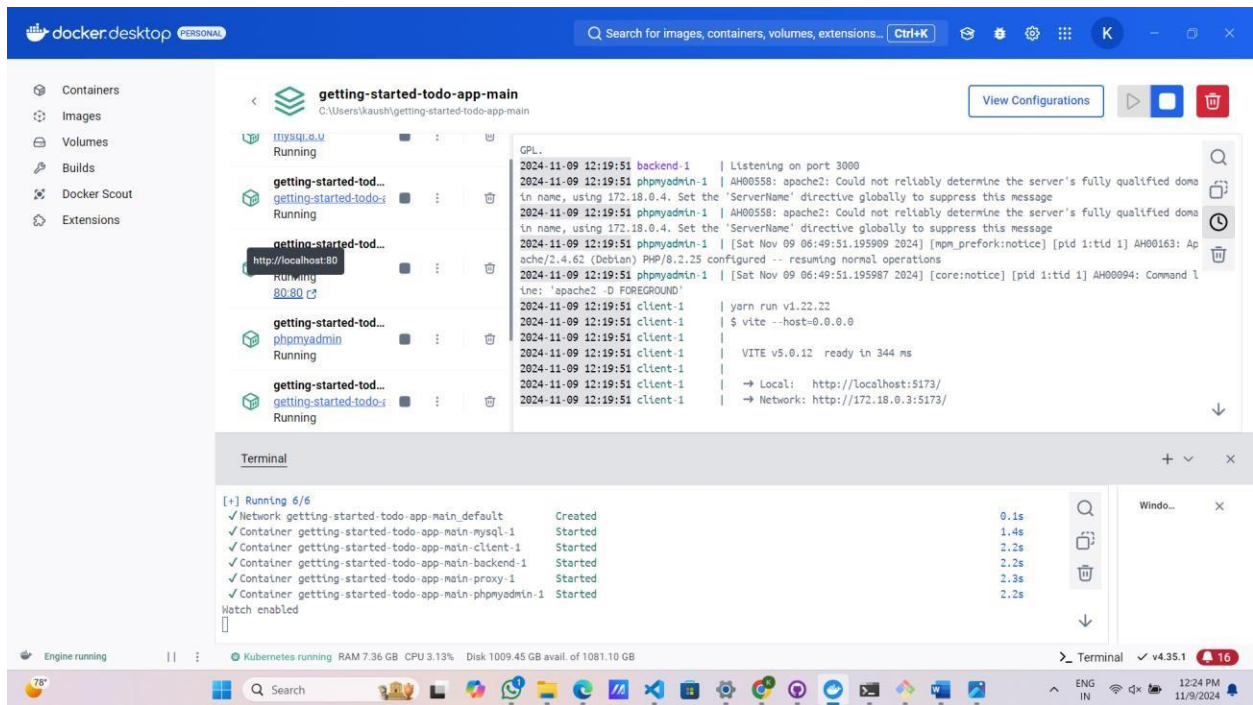
✓ Container getting-started-todo-app-main-proxy-1 Started

✓ Container getting-started-todo-app-main-phpmyadmin-1 Started

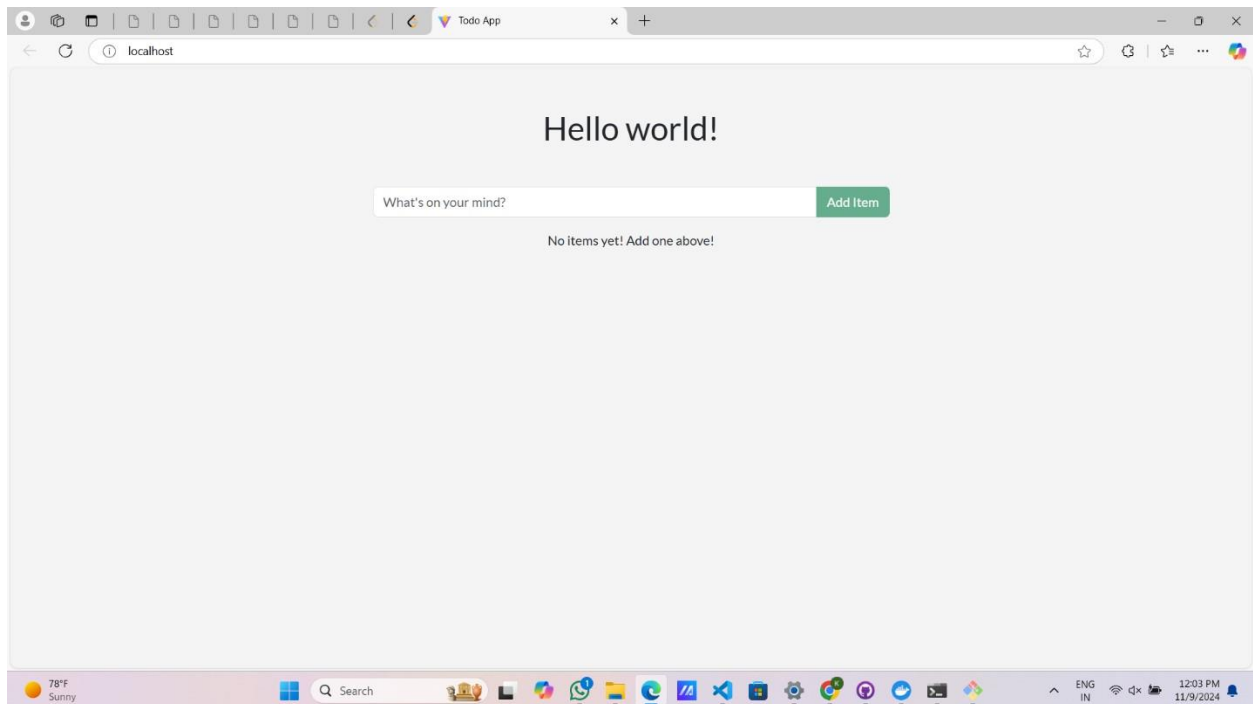
Watch enabled

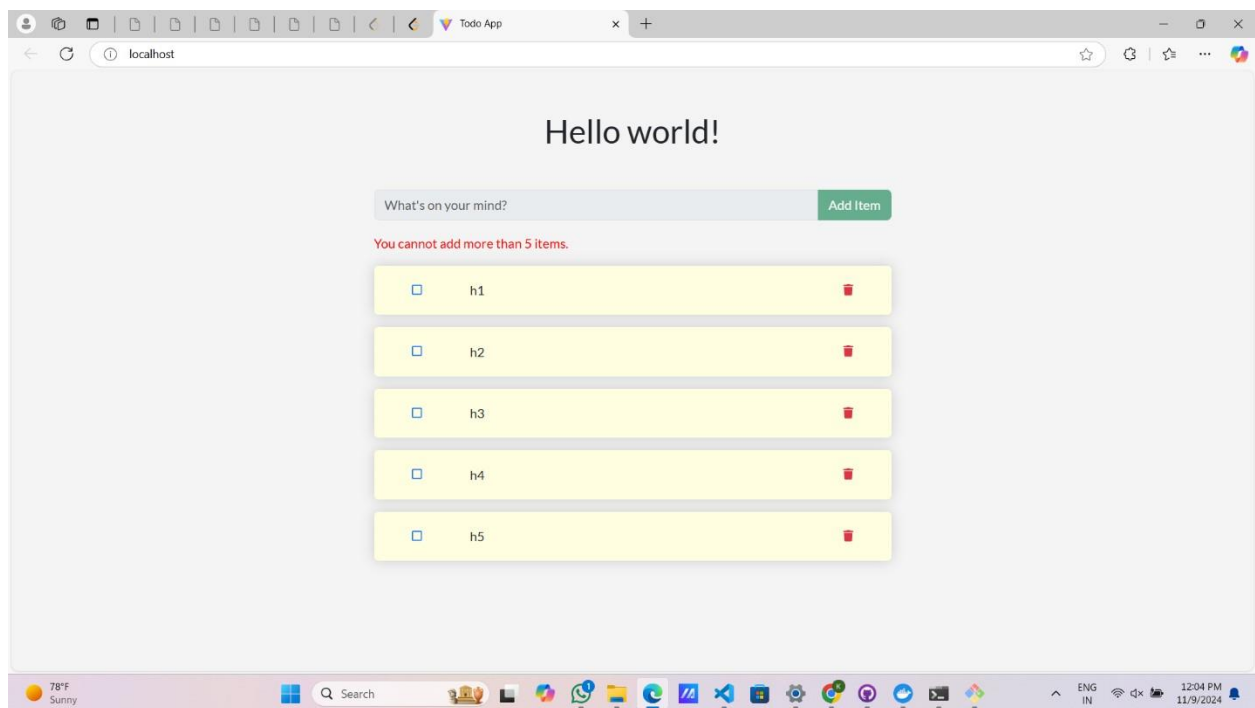
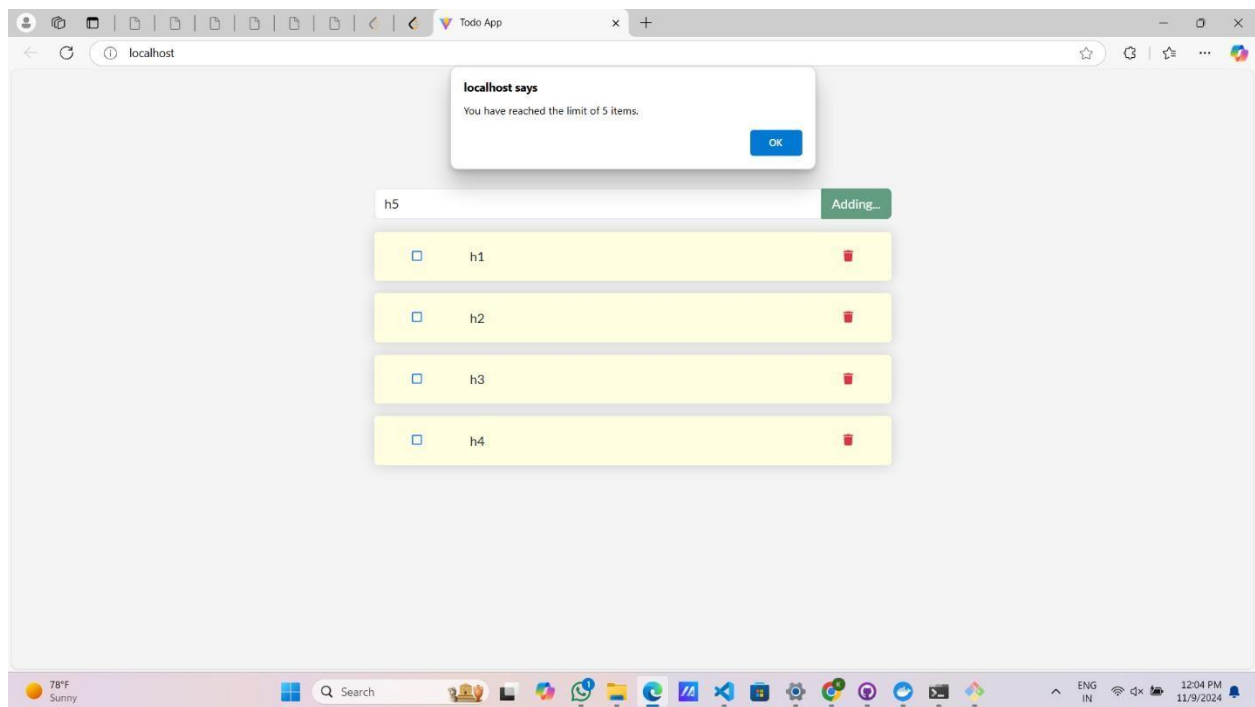
Engine running | Kubernetes running RAM 7.35 GB CPU 3.88% Disk 1009.45 GB avail. of 1081.10 GB

78° | Search | 12:23 PM 11/9/2024

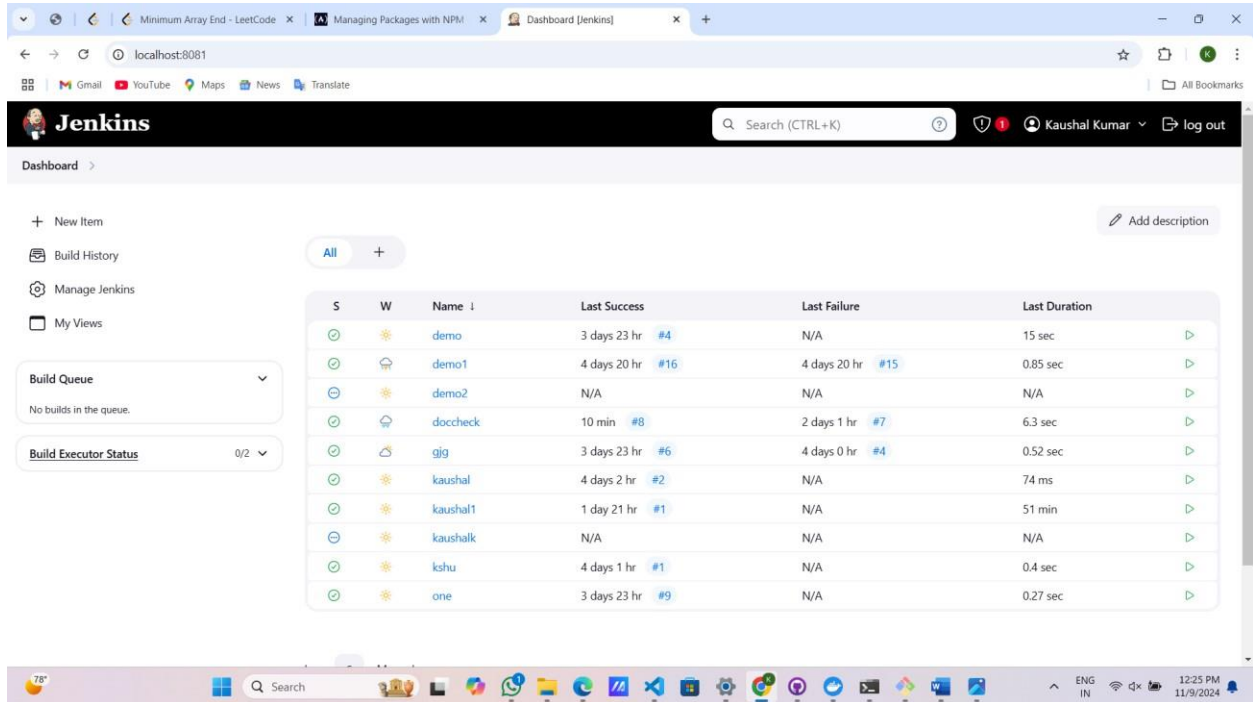


# TO-DO APP



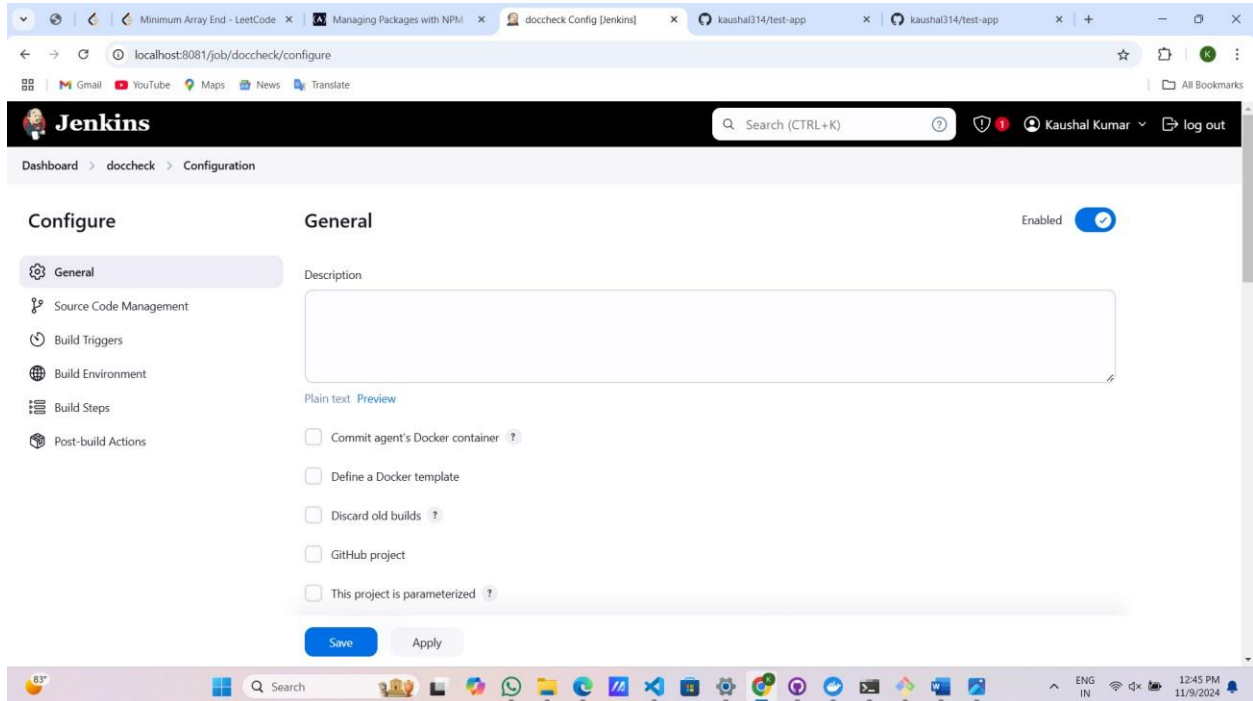


# JENKINS



The screenshot shows the Jenkins Dashboard in a web browser. The browser's address bar displays 'localhost:8081'. The Jenkins header includes a search bar, a user profile for 'Kaushal Kumar', and a 'log out' link. The dashboard features a sidebar with navigation options: 'New Item', 'Build History', 'Manage Jenkins', and 'My Views'. A 'Build Queue' section indicates 'No builds in the queue.' and a 'Build Executor Status' section shows '0/2' executors. The main area displays a table of build jobs with columns for status, icon, name, last success, last failure, and last duration.

S	W	Name	Last Success	Last Failure	Last Duration
🟢	☀️	demo	3 days 23 hr #4	N/A	15 sec
🟢	☀️	demo1	4 days 20 hr #16	4 days 20 hr #15	0.85 sec
🟡	☀️	demo2	N/A	N/A	N/A
🟢	☀️	doccheck	10 min #8	2 days 1 hr #7	6.3 sec
🟢	☀️	gig	3 days 23 hr #6	4 days 0 hr #4	0.52 sec
🟢	☀️	kaushal	4 days 2 hr #2	N/A	74 ms
🟢	☀️	kaushal1	1 day 21 hr #1	N/A	51 min
🟡	☀️	kaushalk	N/A	N/A	N/A
🟢	☀️	kshu	4 days 1 hr #1	N/A	0.4 sec
🟢	☀️	one	3 days 23 hr #9	N/A	0.27 sec



The screenshot shows the Jenkins Configuration page for the 'doccheck' job. The browser's address bar displays 'localhost:8081/job/doccheck/configure'. The page has a sidebar with configuration options: 'General', 'Source Code Management', 'Build Triggers', 'Build Environment', 'Build Steps', and 'Post-build Actions'. The 'General' tab is selected, showing a 'Description' text area, a 'Plain text' preview, and several checkboxes for build options. The 'Enabled' toggle is checked.

**Configure** **General** Enabled

Description

Plain text [Preview](#)

- ☐ Commit agent's Docker container
- ☐ Define a Docker template
- ☐ Discard old builds
- ☐ GitHub project
- ☐ This project is parameterized

[Save](#) [Apply](#)



Dashboard > doccheck > Configuration

## Configure

- General
- Source Code Management
- Build Triggers
- Build Environment
- Build Steps**
- Post-build Actions

### Build Steps

**Execute Windows batch command**

Command

[See the list of available environment variables](#)

```
docker --version
docker images
docker run hello-world
docker ps
docker pull nginx
```

Advanced

Add build step

### Post-build Actions

Add post-build action

Save Apply

Dashboard > doccheck

## Jenkins

Search (CTRL+K) Kaushal Kumar log out

Status

Changes

Workspace

Build Now

Configure

Delete Project

Rename

### doccheck

Add description

### Permalinks

- Last build (#8), 11 min ago
- Last stable build (#8), 11 min ago
- Last successful build (#8), 11 min ago
- Last failed build (#7), 2 days 1 hr ago
- Last unsuccessful build (#7), 2 days 1 hr ago
- Last completed build (#8), 11 min ago

### Builds

Filter

Today

- #8 12:14 PM

November 7, 2024

- #7 10:54 AM

localhost:8081/job/doccheck/build?delay=0sec

Dashboard > doccheck > #8

Status

</> Changes

Console Output

Edit Build Information

Delete build '#8'

Timings

<- Previous Build

#8 (Nov 9, 2024, 12:14:24 PM)

Add description

Keep this build forever



Started by user Kaushal Kumar

Started 12 min ago

Took 6.3 sec



This run spent:

- 14 ms waiting;
- 6.3 sec build duration;
- 6.3 sec total from scheduled to completion.



No changes.

localhost:8081/job/doccheck/8/console

REST API Jenkins 2.479.1

Dashboard > doccheck > #8 > Console Output

Status

</> Changes

Console Output

Edit Build Information

Delete build '#8'

Timings

<- Previous Build

Console Output

Download

Copy

View as plain text

Started by user Kaushal Kumar

Running as SYSTEM

Building in workspace C:\ProgramData\Jenkins\jenkins\workspace\doccheck

[doccheck] \$ cmd /c call c:\Windows\TEMP\jenkins12578679568962015410.bat

C:\ProgramData\Jenkins\jenkins\workspace\doccheck>docker --version  
Docker version 27.3.1, build ce12230

C:\ProgramData\Jenkins\jenkins\workspace\doccheck>docker images

REPOSITORY	SIZE	TAG	IMAGE ID
getting-started-todo-app-main-client	1.74GB	latest	69126b2b07f3 2 days ago
mynewimage	279MB	1.0	f1b3dbe03f56 2 days ago
kaushal314/getting-started-todo-app-main	1.61GB	latest	f356d3c00ae9 2 days ago
myapp	1.61GB	1.0	fd1f56a6465f 2 days ago
getting-started-todo-app-main-backend	1.7GB	latest	6dc06a66ad8a 3 days ago
jenkins/jenkins		latest	c419b505a815 3 days ago

Dashboard > doccheck > #8 > Console Output

```
months ago 8.2MB latest 2ec46aba67db 16
phpmyadmin
months ago 799MB 7ecf567ea070 18
docker/desktop-vpnkit-controller dc331cb22850be0cd97c84a9cfecaf44a1afb6e
months ago 47MB d211f485f2dd 18
hello-world latest
months ago 24.4KB 7031c1b28338 2
registry.k8s.io/pause 3.9
years ago 1.07MB 115d77efe6e2 3
docker/desktop-storage-provisioner v2.0
years ago 59.2MB 257fbfffc95 5
casanode/welcome arm
years ago 28.1MB ef079061209e 5
okteto/welcome latest
years ago 109MB

C:\ProgramData\Jenkins\jenkins\workspace\doccheck>docker run hello-world

Hello from Docker!
This message shows that your installation appears to be working correctly.

To generate this message, Docker took the following steps:
1. The Docker client contacted the Docker daemon.
2. The Docker daemon pulled the "hello-world" image from the Docker Hub.
   (amd64)
3. The Docker daemon created a new container from that image which runs the
   executable that produces the output you are currently reading.
4. The Docker daemon streamed that output to the Docker client, which sent it
```

Dashboard > doccheck > #8 > Console Output

```
getting-started-todo-app-main-phpmyadmin-1
1da1ae044508 mysql:8.0 "docker-entrypoint.s..." 12 minutes ago Up 12 minutes 3306/tcp, 33060/tcp
25890efc35ef getting-started-todo-app-main-client "docker-entrypoint.s..." 12 minutes ago Up 12 minutes
05ebabda70d3 getting-started-todo-app-main-backend "docker-entrypoint.s..." 12 minutes ago Up 12 minutes
df4aa679ebb1 traefik:v2.11 "/entrypoint.sh --pr..." 12 minutes ago Up 12 minutes 0.0.0.0:80->80/tcp
809e21f54733 okteto/welcome:latest "/app/run.sh" 3 hours ago Up 3 hours 80/tcp
funny_swartz
336ce451feaf 28402db69fec "/docker-entrypoint..." 3 hours ago Up 3 hours
k8s_nginx_nginx-depl-85c9d7c5f4-9s74x_default_eb75fee8-957c-4c60-a571-688bc19e036c_2

C:\ProgramData\Jenkins\jenkins\workspace\doccheck>docker pull nginx
Using default tag: latest
latest: Pulling from library/nginx
Digest: sha256:28402db69fec7c17e179ea87882667f1e054391138f77ffa0c3eb388efc3ffb
Status: Image is up to date for nginx:latest
docker.io/library/nginx:latest

C:\ProgramData\Jenkins\jenkins\workspace\doccheck>exit 0
Finished: SUCCESS
```

REST API Jenkins 2.479.1

Minimum Array End - LeetCode x Managing Packages with NPM x gig [Jenkins] x kaushal314/test-app x test-app/ at main - kaushal314/ x +

localhost8081/job/gig/

Gmail YouTube Maps News Translate All Bookmarks

# Jenkins

Search (CTRL+K) Kaushal Kumar log out

Dashboard > gig

Status

Changes

Build with Parameters

Configure

Delete Pipeline

Stages

Rename

Pipeline Syntax

gig

this

Permalinks

- Last build (#6), 4 days 0 hr ago
- Last stable build (#6), 4 days 0 hr ago
- Last successful build (#6), 4 days 0 hr ago
- Last failed build (#4), 4 days 0 hr ago
- Last unsuccessful build (#4), 4 days 0 hr ago
- Last completed build (#6), 4 days 0 hr ago

Edit description

Builds

Filter /

November 5, 2024

- #6 12:27 PM
- #5 12:20 PM

localhost8081/job/gig/configure

83° Search ENG IN 1:05 PM 11/9/2024

Minimum Array End - LeetCode x Managing Packages with NPM x gig Config [Jenkins] x kaushal314/test-app x test-app/ at main - kaushal314/ x +

localhost8081/job/gig/configure

Gmail YouTube Maps News Translate All Bookmarks

# Jenkins

Search (CTRL+K) Kaushal Kumar log out

Dashboard > gig > Configuration

Configure

General

Advanced Project Options

Pipeline

General

Enabled

Description

this

Plain text Preview

☐ Discard old builds ?

☐ Do not allow concurrent builds

☐ Do not allow the pipeline to resume if the controller restarts

☐ GitHub project

☐ Pipeline speed/durability override ?

Save Apply

83° Search ENG IN 1:06 PM 11/9/2024

Dashboard > gig > Configuration

## Configure

General  
Advanced Project Options  
Pipeline

Definition  
Pipeline script

```
1 pipeline {  
2   agent any  
3   parameters {  
4     string(name: 'HELLO', defaultValue: 'Ar Jenkins', description: 'Who should I say hello to?')  
5     text(name: 'HOW', defaultValue: '', description: 'Enter some information about the person')  
6     booleanParam(name: 'TOUGHT', defaultValue: true, description: 'Toggle this value')  
7     choice(name: 'CHOICE', choices: ['One', 'Two', 'Three'], description: 'Pick something')  
8     password(name: 'PASS', defaultValue: 'SECRET', description: 'Enter a password')  
9   }  
10  stages {  
11    stage('Example') {  
12      steps {  
13        echo "Hello ${params.HELLO}"  
14        echo "Biography: ${params.HOW}"  
15        echo "Toggle: ${params.TOUGHT}"  
16        echo "Choice: ${params.CHOICE}"  
17        echo "Password: ${params.PASS}"  
18      }  
19    }  
20  }  
21 }
```

☒ Use Groovy Sandbox

Pipeline Syntax

Save Apply

REST API Jenkins 2.479.1

Dashboard > gig > #6

## Console Output

Status  
Changes  
Console Output  
Edit Build Information  
Delete build '#6'  
Parameters  
Timings  
Pipeline Overview  
Pipeline Console  
Replay  
Pipeline Steps  
Workspaces  
Previous Build

Started by user Kaushal Kumar  
[Pipeline] Start of Pipeline  
[Pipeline] node  
Running on Jenkins in C:\ProgramData\Jenkins\jenkins\workspace\gig  
[Pipeline] {  
[Pipeline] stage  
[Pipeline] { (Example)  
[Pipeline] echo  
Hello Ar Jenkins  
[Pipeline] echo  
Biography:  
[Pipeline] echo  
Toggle: true  
[Pipeline] echo  
Choice: One  
[Pipeline] echo  
Warning: A secret was passed to "echo" using Groovy String interpolation, which is insecure.  
Affected argument(s) used the following variable(s): [PASSWORD]  
See https://jenkins.io/redirect/groovy-string-interpolation for details.  
Password: SECRET  
[Pipeline] }  
[Pipeline] }

Download Copy View as plain text