

## EXPERIMENT 3&4

### DOCKER & DOCKER HUB

- LOGIN

```
[dhyepatel@Dhyeys-MacBook-Air desktop % docker login -u dhyey2907  
[Password:  
Login Succeeded
```

- PULL IMAGE FROM DOCKER HUB

```
Login Succeeded  
[dhyepatel@Dhyeys-MacBook-Air desktop % docker pull tomcat:latest  
latest: Pulling from library/tomcat  
4f4fb700ef54: Already exists  
cc43ec4c1381: Download complete  
7a7a6425082b: Download complete  
c94d114b4100: Download complete  
393d23927f0e: Already exists  
09baae02538f: Already exists  
0135212c894b: Already exists  
29795b0d35ae: Download complete  
Digest: sha256:e72d6851e5ee0ef010bb1089216da5fc4b719556e6c3714023cc94429ce586a3  
Status: Downloaded newer image for tomcat:latest  
docker.io/library/tomcat:latest
```

- CONTAINERISE IMAGE AND RUN THE CONTAINER

```
dhyepatel@Dhyeys-MacBook-Air desktop % docker run -d -p 8888:8080 --name my-tomcat-server tomcat:latest  
6fbadbe1ab9cc7cb83d13f98f668487bd563649e601c8150779fa7ba40905686
```

- VIEW RUNNING CONTAINERS

```
dhyepatel@Dhyeys-MacBook-Air desktop % docker ps  
CONTAINER ID IMAGE COMMAND CREATED STATUS PORTS NAMES  
6fbadbe1ab9c tomcat:latest "catalina.sh run" 11 seconds ago Up 11 seconds 0.0.0.0:8888->8080/tcp my-tomcat-server  
a7f8a6276b8f moby/buildkit:buildx-stable-1 "buildkitd --allow-i..." 6 months ago Up 8 minutes buildx_buildkit_admiring_raman0
```

- STOP RUNNING CONTAINER

```
dhyepatel@Dhyeys-MacBook-Air desktop % docker stop my-tomcat-server  
my-tomcat-server
```

- VIEW ALL RUNNING AND NON RUNNING CONTAINERS

```
dhyepatel@Dhyeys-MacBook-Air desktop % docker ps -a  
CONTAINER ID IMAGE COMMAND CREATED STATUS PORTS NAMES  
6fbadbe1ab9c tomcat:latest "catalina.sh run" 23 seconds ago Exited (143) 5 seconds ago my-tomcat-server  
a7f8a6276b8f moby/buildkit:buildx-stable-1 "buildkitd --allow-i..." 6 months ago Up 8 minutes buildx_buildkit_admiring_raman0
```

- START CONTAINER

```
dhyeypatel@Dhyeys-MacBook-Air desktop % docker start my-tomcat-server
my-tomcat-server
```

- STOP CONTAINER

```
dhyeypatel@Dhyeys-MacBook-Air desktop % docker stop my-tomcat-server
docker rm my-tomcat-server
my-tomcat-server
```

- LOGS OF RUNNING CONTAINER

```
dhyeypatel@Dhyeys-MacBook-Air desktop % docker logs my-tomcat-server
07-Sep-2025 18:51:49.388 INFO [main] org.apache.catalina.startup.VersionLoggerListener.log Server version name: Apache Tomcat/11.0.11
07-Sep-2025 18:51:49.392 INFO [main] org.apache.catalina.startup.VersionLoggerListener.log Server built:   Sep 1 2025 10:24:44 UTC
07-Sep-2025 18:51:49.393 INFO [main] org.apache.catalina.startup.VersionLoggerListener.log Server version number: 11.0.11.0
07-Sep-2025 18:51:49.393 INFO [main] org.apache.catalina.startup.VersionLoggerListener.log OS Name: Linux
07-Sep-2025 18:51:49.393 INFO [main] org.apache.catalina.startup.VersionLoggerListener.log OS Version: 6.12.5-linuxkit
07-Sep-2025 18:51:49.393 INFO [main] org.apache.catalina.startup.VersionLoggerListener.log Architecture: aarch64
07-Sep-2025 18:51:49.393 INFO [main] org.apache.catalina.startup.VersionLoggerListener.log Java Home: /opt/java/openjdk
07-Sep-2025 18:51:49.393 INFO [main] org.apache.catalina.startup.VersionLoggerListener.log JVM Version: 21.0.8+9-LTS
07-Sep-2025 18:51:49.393 INFO [main] org.apache.catalina.startup.VersionLoggerListener.log JVM Vendor: Eclipse Adoptium
07-Sep-2025 18:51:49.393 INFO [main] org.apache.catalina.startup.VersionLoggerListener.log CATALINA_HOME: /usr/local/tomcat
07-Sep-2025 18:51:49.393 INFO [main] org.apache.catalina.startup.VersionLoggerListener.log Command line argument: -Djava.util.logging.config.file=/usr/local/tomcat/conf/logging.properties
07-Sep-2025 18:51:49.405 INFO [main] org.apache.catalina.startup.VersionLoggerListener.log Command line argument: -Djava.util.logging.manager=org.apache.juli.ClassLoaderLogManager
07-Sep-2025 18:51:49.405 INFO [main] org.apache.catalina.startup.VersionLoggerListener.log Command line argument: -Djdk.tls.ephemeralDHKeySize=2048
07-Sep-2025 18:51:49.406 INFO [main] org.apache.catalina.startup.VersionLoggerListener.log Command line argument: -Dorg.apache.catalina.security.SecurityListener.UMASK=0027
07-Sep-2025 18:51:49.406 INFO [main] org.apache.catalina.startup.VersionLoggerListener.log Command line argument: --add-opens=java.base/java.lang=ALL-UNNAMED
07-Sep-2025 18:51:49.406 INFO [main] org.apache.catalina.startup.VersionLoggerListener.log Command line argument: --add-opens=java.base/java.lang.reflect=ALL-UNNAMED
07-Sep-2025 18:51:49.406 INFO [main] org.apache.catalina.startup.VersionLoggerListener.log Command line argument: --add-opens=java.base/java.io=ALL-UNNAMED
07-Sep-2025 18:51:49.406 INFO [main] org.apache.catalina.startup.VersionLoggerListener.log Command line argument: --add-opens=java.base/java.util=ALL-UNNAMED
07-Sep-2025 18:51:49.406 INFO [main] org.apache.catalina.startup.VersionLoggerListener.log Command line argument: --add-opens=java.rmi/sun.rmi.transport=ALL-UNNAMED
07-Sep-2025 18:51:49.406 INFO [main] org.apache.catalina.startup.VersionLoggerListener.log Command line argument: --enable-native-access=ALL-UNNAMED
07-Sep-2025 18:51:49.406 INFO [main] org.apache.catalina.startup.VersionLoggerListener.log Command line argument: -Dcatalina.base=/usr/local/tomcat
07-Sep-2025 18:51:49.406 INFO [main] org.apache.catalina.startup.VersionLoggerListener.log Command line argument: -Dcatalina.home=/usr/local/tomcat
07-Sep-2025 18:51:49.406 INFO [main] org.apache.catalina.startup.VersionLoggerListener.log Command line argument: -Djava.io.tmpdir=/usr/local/tomcat/temp
07-Sep-2025 18:51:49.413 INFO [main] org.apache.catalina.core.AprLifecycleListener.lifecycleEvent Loaded Apache Tomcat Native library [2.0.9] using APR version [1.7.2].
07-Sep-2025 18:51:49.412 INFO [main] org.apache.catalina.core.AprLifecycleListener.initializeSSL OpenSSL successfully initialized [OpenSSL 3.0.13 30 Jan 2024]
07-Sep-2025 18:51:49.440 INFO [main] org.apache.catalina.core.StandardProtocolHandler startInternal [http://0.0.0.0:8080]
07-Sep-2025 18:51:49.441 INFO [main] org.apache.catalina.startup.Catalina.load Server startup in [450] milliseconds
07-Sep-2025 18:51:49.705 INFO [main] org.apache.catalina.core.StandardService.startInternal Starting service [Catalina]
07-Sep-2025 18:51:49.706 INFO [main] org.apache.catalina.core.StandardEngine.startInternal Starting Servlet engine: [Apache Tomcat/11.0.11]
07-Sep-2025 18:51:49.714 INFO [main] org.apache.coyote.AbstractProtocol.start Starting ProtocolHandler ["http-nio-8080"]
07-Sep-2025 18:51:49.720 INFO [main] org.apache.catalina.startup.Catalina.start Server startup in [38] milliseconds
dhyeypatel@Dhyeys-MacBook-Air desktop % docker exec -it my-tomcat-server /bin/bash
root@148c6dc96bfc:/usr/local/tomcat# 
root@148c6dc96bfc:/usr/local/tomcat# 
root@148c6dc96bfc:/usr/local/tomcat# 
```

- CONTAINER ON LOCAL HOST

If you're seeing this, you've successfully installed Tomcat. Congratulations!

**Developer Quick Start**

- [Tomcat Setup](#)
- [First Web Application](#)

**Recommended Reading:**

- [Security Considerations HOW-TO](#)
- [Manager Application HOW-TO](#)
- [Clustering/Session Replication HOW-TO](#)

**Documentation**

- [Tomcat 8.5 Documentation](#)
- [Tomcat 8.5 Configuration](#)
- [Tomcat Wiki](#)

Find additional important configuration information in:

\$CATALINA\_HOME/ RUNNING .txt

Developers may be interested in:

- [Tomcat 8.5 Bug Database](#)
- [Tomcat 8.5 JavaDocs](#)
- [Tomcat 8.5 SVN Repository](#)

**Getting Help**

**FAQ and Mailing Lists**

The following mailing lists are available:

<b>tomcat-announce</b> Important announcements, releases, security vulnerability notifications. (Low volume).
<b>tomcat-users</b> User support and discussion
<b>taglibs-user</b> User support and discussion for Apache Taglibs
<b>tomcat-dev</b> Development mailing list, including commit messages

- INSPECT CONTAINER

```
Last login: Sun Sep  7 21:47:06 on ttys007
dhyeypatel@Dhyeys-MacBook-Air desktop % docker inspect my-tomcat-server
[{"Id": "148c6dc96bfc3e93fc58d7bceec2bd649ceaf0035c4cc0c4b4f14789440e4c5b",
 "Created": "2025-09-07T18:51:48.785287429Z",
 "Path": "catalina.sh",
 "Args": [
   "-run"
 ],
 "State": {
   "Status": "running",
   "Running": true,
   "Paused": false,
   "Restarting": false,
   "OOMKilled": false,
   "Dead": false,
   "Pid": 1814,
   "ExitCode": 0,
   "Error": "",
   "StartedAt": "2025-09-07T18:51:48.866326721Z",
   "FinishedAt": "0001-01-01T00:00:00Z"
 },
 "Image": "sha256:e7dd6851e5ee0ef018bb1089216d35fc4b719556e6c3714023c94429ce586a3",
 "ResolvConfPath": "/var/lib/docker/containers/148c6dc96bfc3e93fc58d7bceec2bd649ceaf0035c4cc0c4b4f14789440e4c5b/resolv.conf",
 "HostnamePath": "/var/lib/docker/containers/148c6dc96bfc3e93fc58d7bceec2bd649ceaf0035c4cc0c4b4f14789440e4c5b/hostname",
 "HostPath": "/var/lib/docker/containers/148c6dc96bfc3e93fc58d7bceec2bd649ceaf0035c4cc0c4b4f14789440e4c5bhosts",
 "LogPath": "/var/lib/docker/containers/148c6dc96bfc3e93fc58d7bceec2bd649ceaf0035c4cc0c4b4f14789440e4c5b/148c6dc96bfc3e93fc58d7bceec2bd649ceaf0035c4cc0c4b4f14789440e4c5b-json.log",
 "Name": "my-tomcat-server",
 "RestartCount": 0,
 "Driver": "overlay2",
 "Platform": "linux",
 "MountLabel": "",
 "ProcessLabel": "",
 "AppArmorProfile": "",
 "ExecIDs": [
   "308ebef1b2cdf7897d48b882da5f3391b5fcf32c3216837e6dea07e82032be2e"
 ],
 "HostConfig": {
   "Binds": null,
   "ContainerIDFile": "",
   "LogConfig": {
     "Type": "json-file",
     "Config": {}
   },
   "NetworkMode": "bridge",
   "PortBindings": [
     {
       "HostIP": "",
       "HostPort": "8888"
     }
   ]
 },
 "RestartPolicy": {
   "Name": "no",
   "MaximumRetryCount": 0
 },
 "AutoRemove": false,
 "VolumeDriver": "",
 "VolumesFrom": null,
 "ConsoleSize": [
   65
 ]}
```

- VIEW ALL DOCKER IMAGES

REPOSITORY	TAG	IMAGE ID	CREATED	SIZE
dhyey2907/my-java-app	1.0	72f9770ea788	53 minutes ago	633MB
my-java-app	latest	72f9770ea788	53 minutes ago	633MB
tomcat	latest	e72d6851e5ee	2 days ago	741MB
moby/buildkit	buildx-stable-1	2c59b0a95f5b	6 months ago	303MB

- CONSOLE APPLICATION CODE

The screenshot shows a Java project structure on the left and two code editors on the right. The project tree includes a .idea folder, a src folder containing a Dockerfile and HelloDocker.java, a .gitignore file, and a java\_docker.iml file. The HelloDocker.java editor shows the following code:

```
1 public class HelloDocker {  
2     public static void main(String[] args) {  
3         System.out.println("Hello from Dhyey and Hil IT SEM-7");  
4     }  
5 }  
6  
7 }  
8 }  
9 }
```

- DOCKERFILE CODE

The screenshot shows the same Java project structure on the left and two code editors on the right. The Dockerfile editor shows the following code:

```
1 # Use an official OpenJDK runtime as a parent image  
2 FROM openjdk:17-slim  
3  
4 # Set the working directory inside the container  
5 WORKDIR /app  
6  
7 # Copy the local HelloDocker.java file to the container's working directory  
8 COPY HelloDocker.java .  
9  
10 # Compile the Java code inside the container during the build  
11 RUN javac HelloDocker.java  
12  
13 # Specify the command to run when the container starts  
14 CMD ["java", "HelloDocker"]  
15  
16 # DHYEY AND HIL'S DOCKER FILE
```

- BUILD IMAGE FROM DOCKER FILE

```
Terminal Local × + ✓
dhyeyapatel@Dhyey-MacBook-Air ~ % docker build -t my-java-app .
[+] Building 27.4s (10/10) FINISHED
    => [internal] load build definition from Dockerfile
    => => transferring dockerfile: 517B
    => [internal] load metadata for docker.io/library/openjdk:17-slim
    => [auth] library/openjdk:pull token for registry-1.docker.io
    => [internal] load .dockerignore
    => => transferring context: 2B
    => [1/4] FROM docker.io/library/openjdk:17-slim@sha256:aaa3b3cb27e3e520b8f116863d0580c438ed55ecfa0bc126b41f68c3f62f9774
    => => resolve docker.io/library/openjdk:17-slim@sha256:aaa3b3cb27e3e520b8f116863d0580c438ed55ecfa0bc126b41f68c3f62f9774
    => => sha256:a59f13dc084e185af417a4cc6d1be2534adaff0c4f35ac2166a539260fe4e8e945 1.36MB / 1.36MB
    => => sha256:1d5035d2d5c6c24e610a9317c6907a7c58ef5d12757d559841e5d0851512ed9c 186.53MB / 186.53MB
    => => sha256:6d4a449ac69c579312443ded09f57c4894e7adb42f7406abd364f95982fafc59 30.07MB / 30.07MB
    => => extracting sha256:d6d4a449ac69c579312443ded09f57c4894e7adb42f7406abd364f95982fafc59
    => => extracting sha256:a59f13dc08e4185af417a4cc6d1be2534adaff0c4f35ac2166a539260fe4e8e945
    => => extracting sha256:1d5035d2d5c6c24e610a9317c6907a7c58ef5d12757d559841e5d0851512ed9c
    => [internal] load build context
    => => transferring context: 227B
    => [2/4] WORKDIR /app
    => [3/4] COPY HelloDocker.java .
    => [4/4] RUN javac HelloDocker.java
    => exporting to image
    => => exporting layers
    => => exporting manifest sha256:a16031516c856b63b73735e9fb10cbfc5clca4c5328e7426a181da0b52b7d00c
    => => exporting config sha256:ca6da75a356140dca4432bb3238f06684481a6864bec0f12093bfc96fa237a52
    => => exporting attestation manifest sha256:c14756ab359a0d5b4d40b584d9bf3fd365853013a255d72e15df6355cc22bca2
    => => exporting manifest list sha256:72f9770ea788b071f9f09c04755029b80510dc7e039893870df5e7ec88c1d06f
    => => naming to docker.io/library/my-java-app:latest
    => => unpacking to docker.io/library/my-java-app:latest

View build details: docker-desktop://dashboard/build/desktop-linux/desktop-linux/k1xutzcue62od21222rdigsy
dhyeyapatel@Dhyey-MacBook-Air ~ %
```

- RUN CONTAINER

```
Terminal Local + ▾  
dhyeypatel@Dheyys-MacBook-Air src % docker run --rm my-java-app  
Hello from Dheyey and Hil IT SEM-7  
dhyeypatel@Dheyys-MacBook-Air src %
```

- PUSH IMAGE TO DOCKER HUB

```
dhyeypatel@Dhyey-MacBook-Air src % docker push dhyey2907/my-java-app:1.0
The push refers to repository [docker.io/dhyey2907/my-java-app]
471d05ec3956: Layer already exists
1d5035d2d5c6: Pushed
5a1e04c43115: Layer already exists
8a02d09ebb78: Layer already exists
6d4a449ac69c: Pushed
a59f13dc084e: Layer already exists
96e609fb4ae2: Already exists
1.0: digest: sha256:72f9770ea788b071f9f09c04755029b80510dc7e039893870df5e7ec88c1d06f size: 856
```

- PUSHED IMAGE ON DOCKER HUB

The screenshot shows the Docker Hub 'My Hub' interface. On the left, there's a sidebar with a user profile icon for 'dhyey2907' and sections for 'Repositories', 'Collaborations', 'Settings', 'Default privacy', 'Notifications', 'Billing', 'Usage', 'Pulls', and 'Storage'. The 'Repositories' section is currently selected. The main area displays a table of repositories under the heading 'Repositories'. The table has columns for 'Name', 'Last Pushed', 'Contains', 'Visibility', and 'Scout'. There are three entries:

Name	Last Pushed	Contains	Visibility	Scout
dhyey2907/my-java-app	13 minutes ago	IMAGE	Public	Inactive
dhyey2907/hello-world-nodeapp	14 days ago	IMAGE	Public	Inactive
dhyey2907/cause-connect-backend	7 months ago	IMAGE	Public	Inactive

At the top of the main area, there's a banner for 'Building AI Agents is Now Easy' with a link. Below the table, it says '1–3 of 3'.