

EXPERIMENT 3&4

DOCKER & DOCKER HUB

- LOGIN

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

- PULL IMAGE FROM DOCKER HUB

```
login: 0000000000
[dhyeypatel@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

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

- VIEW RUNNING CONTAINERS

```
dhweypatel@Dhweys-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	0.0.0.0:8088->8080/tcp	my-tomcat-server
af78a6276b8f	moby/buildkit:buildx-stable-1	"buildkitd --allow-i-"	6 months ago	Up 8 minutes		buildx_buildkit_admiring_ramano

- STOP RUNNING CONTAINER

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

- VIEW ALL RUNNING AND NON RUNNING CONTAINERS

```

chavezpavel@00hveys-MacBook-Air desktop % docker ps -a
CONTAINER ID   IMAGE                                COMMAND                  CREATED          STATUS          PORTS          NAMES
6fbad61a1b9c   tomcat:latest                       "catalina.sh run"       23 seconds ago   Exited (143)   5 seconds ago   my-tomcat-server
a7f8ae627ab8f   moby/buildkit:buildx-stable-1      "buildkitd --allow-="   6 months ago    Up 8 minutes   buildkit_buildkit_admiring_ramona

```

- 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
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_BASE: /usr/local/tomcat
07-Sep-2025 18:51:49.393 INFO [main] org.apache.catalina.startup.VersionLoggerListener.log CATALINA_HOME: /usr/local/tomcat
07-Sep-2025 18:51:49.405 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.base/java.util.concurrent=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 18:51:49.422 INFO [main] org.apache.catalina.core.AprLifecycleListener.initializeSSL OpenSSL successfully initialized [OpenSSL 3.0.13 30 Jan 2024]
07-Sep-2025 18:51:49.666 INFO [main] org.apache.coyote.AbstractProtocol.init Initializing ProtocolHandler ["http-nio-8080"]
07-Sep-2025 18:51:49.681 INFO [main] org.apache.catalina.startup.Catalina.load Server initialization in [434] 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# ^C
root@148c6dc96bfc:/usr/local/tomcat# ^C
root@148c6dc96bfc:/usr/local/tomcat# █
```


- CONTAINER ON LOCAL HOST

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Apache Tomcat/8.5.41

 THE APACHE SOFTWARE FOUNDATION
<http://www.apache.org/>

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

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

[Server Status](#)
[Manager App](#)
[Host Manager](#)

Developer Quick Start
[Tomcat Setup](#) [Realms & AAA](#) [Examples](#) [Servlet Specifications](#)
[First Web Application](#) [JDBC DataSources](#) [Tomcat Versions](#)

Managing Tomcat
For security, access to the [manager webapp](#) is restricted. Users are defined in:
\$CATALINA_HOME/conf/tomcat-users.xml
In Tomcat 8.5 access to the manager application is split between different users.
[Read more...](#)
[Release Notes](#)
[Changelog](#)
[Migration Guide](#)
[Security Notices](#)

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

- INSPECT CONTAINER

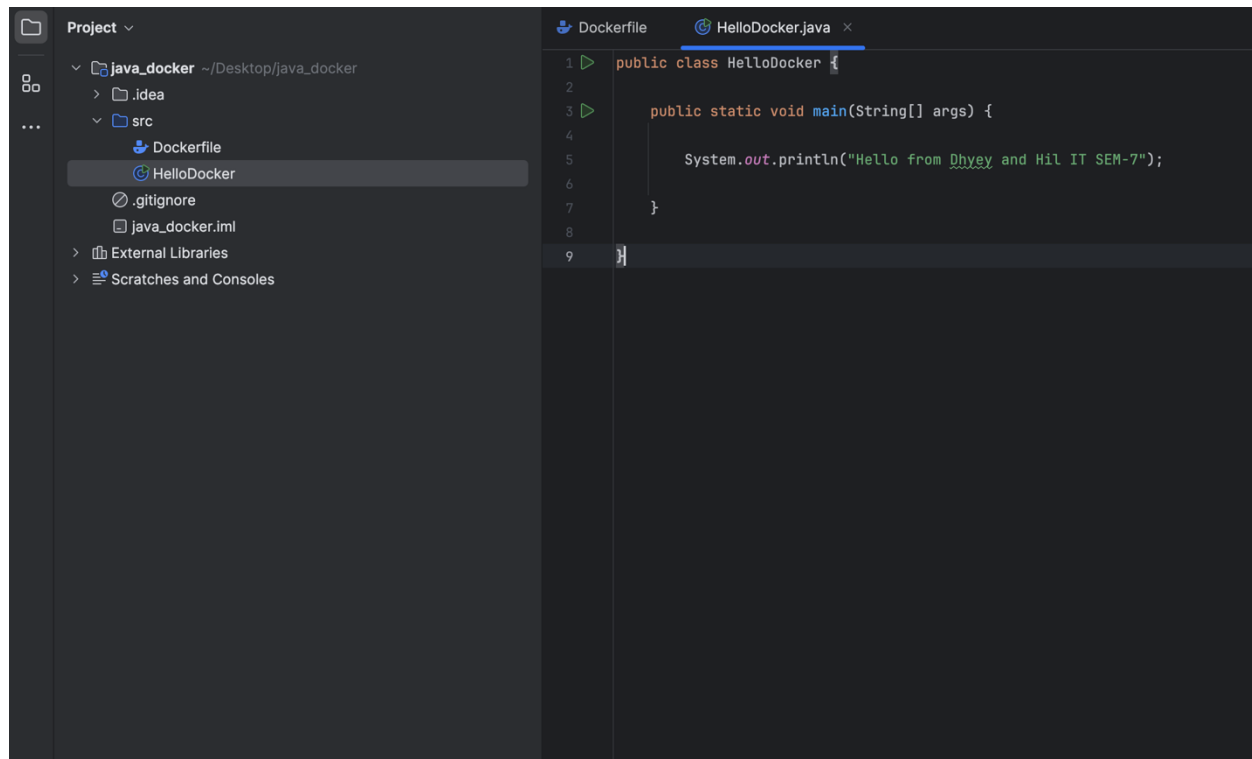
```
Last login: Sun Sep  7 21:47:06 on ttys007
dhyeypatel@Dhyeys-MacBook-Air desktop % docker inspect my-tomcat-server
[
  {
    "Id": "148c6dc96bfc3e93fc58d7bceec2bd649ceaf0035c4cc0c4b4f14789440e4c5b",
    "Created": "2025-09-07T18:51:48.785287429Z",
    "Path": "catalina.sh",
    "Args": [
      "run"
    ],
    "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:e72d6851e5ee0ef018bb1089216da5fc4b719556e6c3714023cc94429ce586a3",
    "ResolvConfPath": "/var/lib/docker/containers/148c6dc96bfc3e93fc58d7bceec2bd649ceaf0035c4cc0c4b4f14789440e4c5b/resolv.conf",
    "HostnamePath": "/var/lib/docker/containers/148c6dc96bfc3e93fc58d7bceec2bd649ceaf0035c4cc0c4b4f14789440e4c5b/hostname",
    "HostsPath": "/var/lib/docker/containers/148c6dc96bfc3e93fc58d7bceec2bd649ceaf0035c4cc0c4b4f14789440e4c5b/hosts",
    "LogPath": "/var/lib/docker/containers/148c6dc96bfc3e93fc58d7bceec2bd649ceaf0035c4cc0c4b4f14789440e4c5b/148c6dc96bfc3e93fc58d7bceec2bd649ceaf0035c4cc0c4b4f14789440e4c5b-json.log",
    "Name": "/my-tomcat-server",
    "RestartCount": 0,
    "Driver": "overlayfs",
    "Platform": "linux",
    "MountLabel": "",
    "ProcessLabel": "",
    "AppArmorProfile": "",
    "ExecIDs": [
      "308eebe1b2cdf7897d48b882da5f3391b5fc32c3216837e6dea07e82032be2e"
    ],
    "HostConfig": {
      "Binds": null,
      "ContainerIDFile": "",
      "LogConfig": {
        "Type": "json-file",
        "Config": {}
      },
      "NetworkMode": "bridge",
      "PortBindings": {
        "8080/tcp": [
          {
            "HostIp": "",
            "HostPort": "8080"
          }
        ]
      },
      "RestartPolicy": {
        "Name": "no",
        "MaximumRetryCount": 0
      },
      "AutoRemove": false,
      "VolumeDriver": "",
      "VolumesFrom": null,
      "ConsoleSize": [
        65,

```

- VIEW ALL DOCKER IMAGES

```
dhyeypatel@Dhyeys-MacBook-Air src % 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
dhyeypatel@Dhyeys-MacBook-Air src %
```

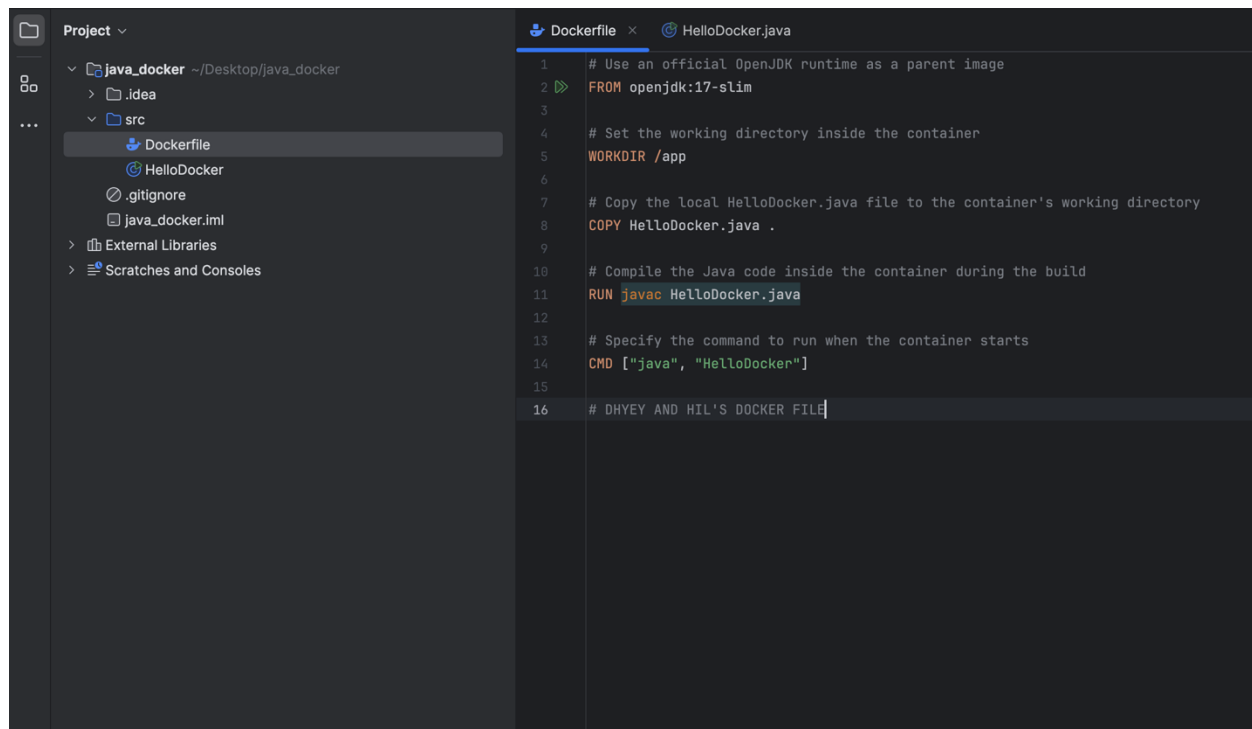
- CONSOLE APPLICATION CODE



The screenshot shows an IDE with a project named 'java_docker' located at '~\Desktop\java_docker'. The project structure includes a 'src' directory containing 'Dockerfile', 'HelloDocker', '.gitignore', and 'java_docker.iml'. The 'HelloDocker.java' file is open in the editor, showing the following code:

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

- DOCKERFILE CODE



The screenshot shows the same IDE with the 'Dockerfile' file open in the editor. The project structure is the same as in the previous screenshot. The 'Dockerfile' code is as follows:

```
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 # DHYEV AND HIL'S DOCKER FILE
```

- BUILD IMAGE FROM DOCKER FILE

```
Terminal Local x + v
dhyeypatel@Dhyeys-MacBook-Air src % docker build -t my-java-app .
[+] Building 27.4s (18/18) 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: 28
=> [1/4] FROM docker.io/library/openjdk:17-slim@sha256:aaa3b3cb27e3e520b8f116863d0580c438ed55ecfa0bc126b41f68c3f62f9774
=> resolve docker.io/library/openjdk:17-slim@sha256:aaa3b3cb27e3e520b8f116863d0580c438ed55ecfa0bc126b41f68c3f62f9774
=> => sha256:a59f13dc084e185af417a4c6d1be2534adaff0c4f35ac2166a539260f4e8e945 1.36MB / 1.36MB
=> => sha256:1d5035d2d5c6c24e610a9317c6907a7c58efd512757d559841e5d0851512ed9c 186.53MB / 186.53MB
=> => sha256:6d4a449ac69c579312443ded09f57c4894e7adb42f7406abd364f95982fafc59 30.07MB / 30.07MB
=> => extracting sha256:6d4a449ac69c579312443ded09f57c4894e7adb42f7406abd364f95982fafc59
=> => extracting sha256:a59f13dc084e185af417a4c6d1be2534adaff0c4f35ac2166a539260f4e8e945
=> => extracting sha256:1d5035d2d5c6c24e610a9317c6907a7c58efd512757d559841e5d0851512ed9c
=> [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:a16031516c856b63b73735e96fb10cbf5c1ca4c5328e7426a181da0b52b7d00c
=> => 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/ki1xutzcue62od21222rdigsv
dhyeypatel@Dhyeys-MacBook-Air src %
```

- RUN CONTAINER

```
Terminal Local x + v
dhyeypatel@Dhyeys-MacBook-Air src % docker run --rm my-java-app
Hello from Dhyey and Hil IT SEM-7
dhyeypatel@Dhyeys-MacBook-Air src %
```

- PUSH IMAGE TO DOCKER HUB

```
dhyeypatel@Dhyeys-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

