

ASSIGNMENT: GAMEOFLIFE-DOCKERFILE

Problem Statement: Deploy **game-of-life.war** on Tomcat server using **Dockerfile**

Solution:

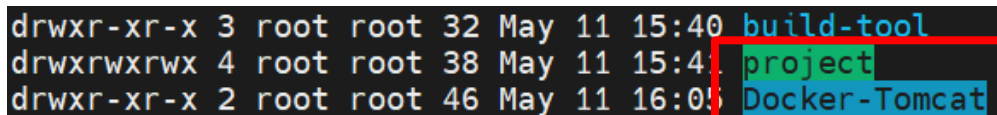
1. Launched an EC2 instance and installed java-openjdk8, git and docker using the below commands:

```
yum install java-1.8.0-openjdk-devel.x86_64 -y
yum install git -y
yum install docker -y
```

2. Downloaded the **apache-maven-3.9.2.bin.zip** and configured Maven using Environment variable inside the **.bash_profile** in the root directory

```
wget https://dlcdn.apache.org/maven/maven-3/3.9.2/binaries/apache-maven-3.9.2-bin.zip
unzip apache-maven-3.9.2.bin.zip
```

3. Created directory named **project** and initialized git inside this directory using **git init** command:



```
drwxr-xr-x 3 root root 32 May 11 15:40 build-tool
drwxrwxrwx 4 root root 38 May 11 15:41 project
drwxr-xr-x 2 root root 46 May 11 16:05 Docker-Tomcat
```

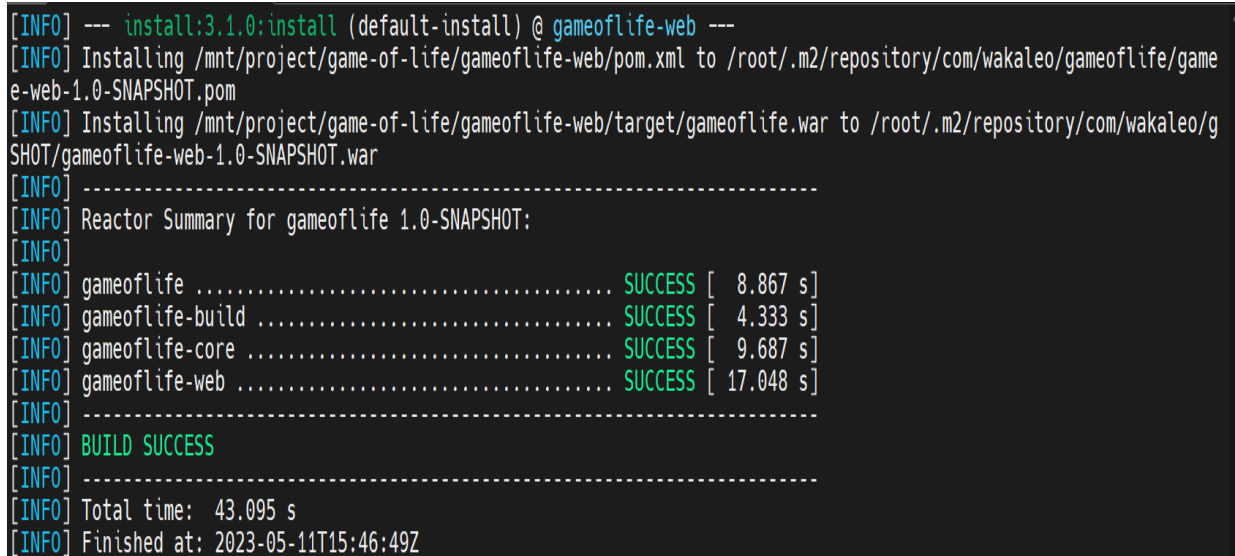
4. Cloned the Remote Repository **game-of-life** from github to the project directory using the following command:

```
git clone https://github.com/chitrangsawant/game-of-life.git
```

5. Build the **gameoflife.war** file by running the following command inside **game-of-life** directory.

```
mvn clean install
```

below image shows successful build of **gameoflife.war** file using mvn clean install command:



```
[INFO] --- install:3.1.0:install (default-install) @ gameoflife-web ---
[INFO] Installing /mnt/project/game-of-life/gameoflife-web/pom.xml to /root/.m2/repository/com/wakaleo/gameoflife/game
e-web-1.0-SNAPSHOT.pom
[INFO] Installing /mnt/project/game-of-life/gameoflife-web/target/gameoflife.war to /root/.m2/repository/com/wakaleo/g
SHOT/gameoflife-web-1.0-SNAPSHOT.war
[INFO] -----
[INFO] Reactor Summary for gameoflife 1.0-SNAPSHOT:
[INFO]
[INFO] gameoflife ..... SUCCESS [ 8.867 s]
[INFO] gameoflife-build ..... SUCCESS [ 4.333 s]
[INFO] gameoflife-core ..... SUCCESS [ 9.687 s]
[INFO] gameoflife-web ..... SUCCESS [ 17.048 s]
[INFO] -----
[INFO] BUILD SUCCESS
[INFO] -----
[INFO] Total time: 43.095 s
[INFO] Finished at: 2023-05-11T15:46:49Z
```

- Created a new directory called **Docker-Tomcat** inside **mnt** directory, and created **Dockerfile** with the following syntax (also refer below image):

```
FROM tomcat:9-jdk8
COPY ./gameoflife.war /usr/local/tomcat/webapps/
EXPOSE 8080
CMD ["/usr/local/tomcat/bin/catalina.sh", "run"]
```

A screenshot of a terminal window with a dark background. The terminal shows the content of a Dockerfile being edited. The text is as follows: FROM tomcat:9-jdk8, COPY ./gameoflife.war /usr/local/tomcat/webapps/, EXPOSE 8080, and CMD ["/usr/local/tomcat/bin/catalina.sh", "run"]. The terminal window has a title bar with a home icon, a network icon, and the address 2. 43.204.107.21 (ec2-user).

```
FROM tomcat:9-jdk8
COPY ./gameoflife.war /usr/local/tomcat/webapps/
EXPOSE 8080
CMD ["/usr/local/tomcat/bin/catalina.sh", "run"]
```

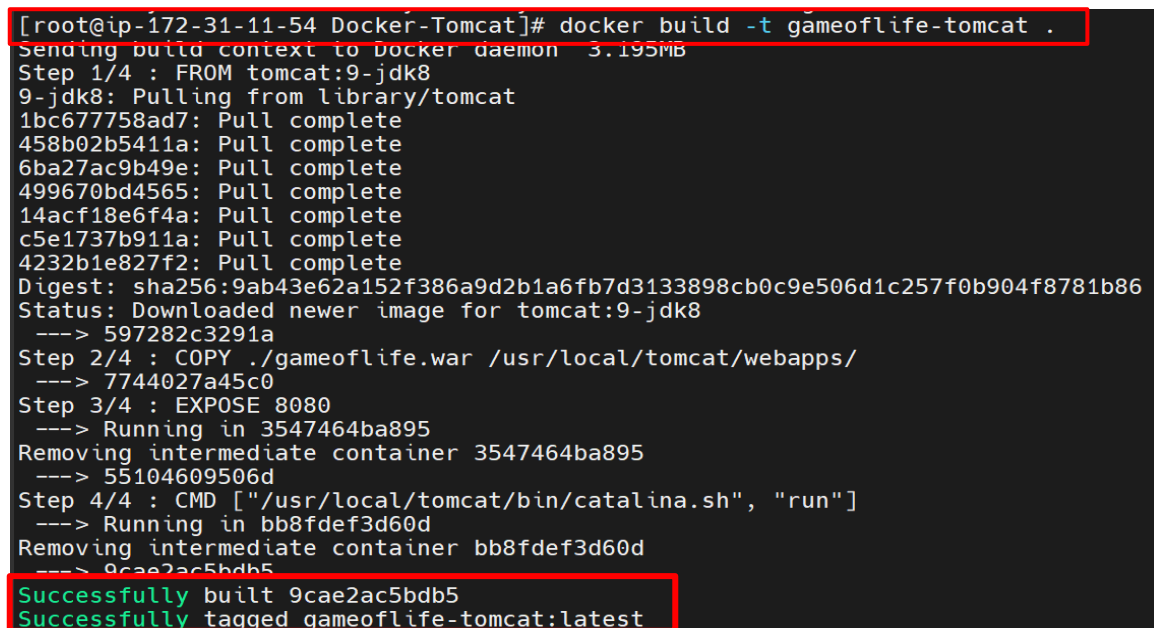
- Copied the **gameoflife.war** inside the **Docker-Tomcat** directory where the **Dockerfile** was created.

```
cp -r /mnt/project/ game-of-life/gameoflife-web/target/gameoflife.war /mnt/Tomcat-Docker
```

- Executed the following commands from the **Docker-Tomcat** directory where the **.war** file and **Dockerfile** were present:

```
docker build -t gameoflife-tomcat .
```

the following output was seen as per the image after executing the above command:

A screenshot of a terminal window showing the output of the 'docker build -t gameoflife-tomcat .' command. The output shows the build process, including pulling the tomcat:9-jdk8 image, copying the gameoflife.war file, exposing port 8080, and running the catalina.sh script. The final output is 'Successfully built 9cae2ac5bdb5' and 'Successfully tagged gameoflife-tomcat:latest'.

```
[root@ip-172-31-11-54 Docker-Tomcat]# docker build -t gameoflife-tomcat .
Sending build context to Docker daemon 3.195MB
Step 1/4 : FROM tomcat:9-jdk8
9-jdk8: Pulling from library/tomcat
1bc677758ad7: Pull complete
458b02b5411a: Pull complete
6ba27ac9b49e: Pull complete
499670bd4565: Pull complete
14acf18e6f4a: Pull complete
c5e1737b911a: Pull complete
4232b1e827f2: Pull complete
Digest: sha256:9ab43e62a152f386a9d2b1a6fb7d3133898cb0c9e506d1c257f0b904f8781b86
Status: Downloaded newer image for tomcat:9-jdk8
--> 597282c3291a
Step 2/4 : COPY ./gameoflife.war /usr/local/tomcat/webapps/
--> 7744027a45c0
Step 3/4 : EXPOSE 8080
--> Running in 3547464ba895
Removing intermediate container 3547464ba895
--> 55104609506d
Step 4/4 : CMD ["/usr/local/tomcat/bin/catalina.sh", "run"]
--> Running in bb8fdef3d60d
Removing intermediate container bb8fdef3d60d
--> 9cae2ac5bdb5
Successfully built 9cae2ac5bdb5
Successfully tagged gameoflife-tomcat:latest
```

9. The **docker images** command shows new image created as below:

```
[root@ip-172-31-11-54 Docker-Tomcat]# docker images
```

REPOSITORY	TAG	IMAGE ID	CREATED	SIZE
gameoflife-tomcat	latest	9cae2ac5bdb5	4 minutes ago	288MB
tomcat	9-jdk8	597282c3291a	22 hours ago	285MB

10. Created a container with the following command and binded the Port 8080 of Host server with the Container Port 8080

```
docker run -itdp 8080:8080 gameoflife-tomcat  
docker ps
```

the following was the output of the above commands

```
[root@ip-172-31-11-54 Docker-Tomcat]# docker run -itdp 8080:8080 gameoflife-tomcat  
aaa9732fd5881399022dd79c28451b60266148582f3735e36cbe6a2bace04baa  
[root@ip-172-31-11-54 Docker-Tomcat]#  
[root@ip-172-31-11-54 Docker-Tomcat]#  
[root@ip-172-31-11-54 Docker-Tomcat]# docker ps
```

CONTAINER ID	IMAGE	COMMAND	CREATED	STATUS	PORTS	NAMES
aaa9732fd588	gameoflife-tomcat	"/usr/local/tomcat/b..."	24 seconds ago	Up 23 seconds	0.0.0.0:8080→8080/tcp, :::8080→8080/tcp	goofy_shannon

```
[root@ip-172-31-11-54 Docker-Tomcat]#
```

11. Copied the Public IP of EC2 instance into the web browser along with Port 8080 and file name shows the following output on screen:

EC2 Management Console x tomcat Tags | Docker Hub x chitrangasawant/game-of-life: De x The Game Of Life x +

← → ↻ Not secure 43.204.107.21:8080/gameoflife/

Welcome to Conway's Game Of Life!

This is a really cool web version of Conway's famous Game Of Life. The Game of Life is a cellular automaton devised by the British mathematician John Horton Conway way back in 1970.

The universe of the Game of Life is an infinite two-dimensional orthogonal grid of square cells, each of which is in one of two possible states, live or dead. Every cell interacts with its eight neighbors, which are the cells that are directly horizontally, vertically, or diagonally adjacent. At each step in time, the following transitions occur:

- Any live cell with fewer than two live neighbours dies, as if caused by underpopulation.
- Any live cell with more than three live neighbours dies, as if by overcrowding.
- Any live cell with two or three live neighbours lives on to the next generation.
- Any dead cell with exactly three live neighbours becomes a live cell.

[New Game](#)

Game Of Life version 1.0-SNAPSHOT (build job \${env.JOB_NAME} - #\${env.BUILD_NUMBER})