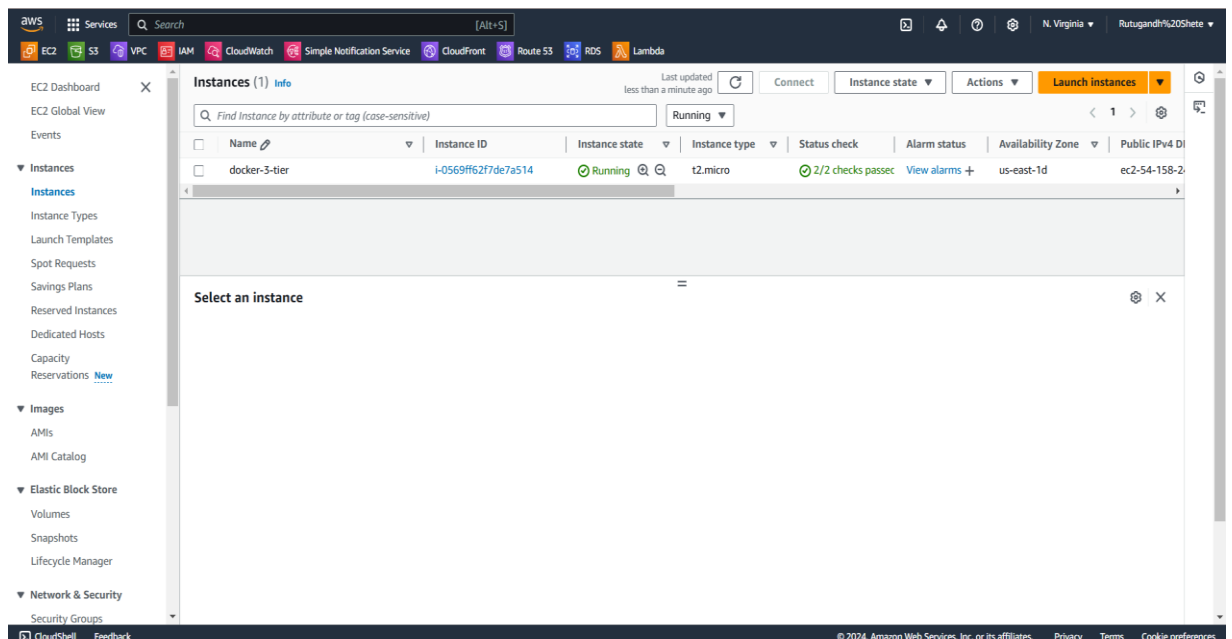


DEVOPS

No:-	Content
1.	Docker
2.	

Steps:

- Launch one ec2 instance



- Install docker in it “yum install docker -y”

```
[ec2-user@ip-172-31-35-246 ~]$ sudo -i
[root@ip-172-31-35-246 ~]# yum update
Last metadata expiration check: 0:13:12 ago on Tue Oct 29 07:18:59 2024.
Dependencies resolved.
Nothing to do.
Complete!
[root@ip-172-31-35-246 ~]# yum install docker -y
Last metadata expiration check: 0:13:23 ago on Tue Oct 29 07:18:59 2024.
Dependencies resolved.

Package                               Architecture      Version            Repository          Size
Installing:
docker                                x86_64            25.0.6-1.amzn2023.0.2  amazonlinux         44 M
Installing dependencies:
containerd                            x86_64            1.7.22-1.amzn2023.0.2  amazonlinux         36 M
iptables-lib                            x86_64            1.8.8-3.amzn2023.0.2  amazonlinux         401 k
iptables-nft                            x86_64            1.8.8-3.amzn2023.0.2  amazonlinux         183 k
libcgroup                             x86_64            3.0-1.amzn2023.0.1    amazonlinux         75 k
libnetfilter_conntrack                 x86_64            1.0.8-2.amzn2023.0.2  amazonlinux         50 k
libnftnl                               x86_64            1.0.1-19.amzn2023.0.2 amazonlinux         30 k
libnftnl                               x86_64            1.2.2-2.amzn2023.0.2  amazonlinux         84 k
pigz                                   x86_64            2.5-1.amzn2023.0.3    amazonlinux         83 k
runc                                   x86_64            1.1.14-1.amzn2023.0.1  amazonlinux         3.2 M

Transaction Summary
Install 10 Packages
Total download size: 84 M
Installed size: 317 M
Downloading Packages:
(1/10): iptables-lib-1.8.8-3.amzn2023.0.2.x86_64.rpm                2.9 MB/s | 401 kB  00:00
(2/10): iptables-nft-1.8.8-3.amzn2023.0.2.x86_64.rpm              2.1 MB/s | 183 kB  00:00
(3/10): libcgroup-3.0-1.amzn2023.0.1.x86_64.rpm                  1.1 MB/s | 75 kB  00:00
(4/10): libnetfilter_conntrack-1.0.8-2.amzn2023.0.2.x86_64.rpm    2.5 MB/s | 50 kB  00:00
(5/10): libnftnl-1.0.1-19.amzn2023.0.2.x86_64.rpm                1.0 MB/s | 30 kB  00:00
(6/10): libnftnl-1.2.2-2.amzn2023.0.2.x86_64.rpm                 1.8 MB/s | 84 kB  00:00
(7/10): pigz-2.5-1.amzn2023.0.3.x86_64.rpm                       2.9 MB/s | 83 kB  00:00
(8/10): runc-1.1.14-1.amzn2023.0.1.x86_64.rpm                     14 MB/s | 3.2 MB  00:00
(9/10): containerd-1.7.22-1.amzn2023.0.2.x86_64.rpm              26 MB/s | 36 MB  00:01
(10/10): docker-25.0.6-1.amzn2023.0.2.x86_64.rpm                 25 MB/s | 44 MB  00:01
Total                                                                46 MB/s | 84 MB  00:01
Running transaction check
Transaction check succeeded.
Running transaction test
```

- Start docker using “systemctl start docker” and “systemctl enable docker”

```
root@ip-172-31-35-246 ~]# systemctl start docker
root@ip-172-31-35-246 ~]# systemctl enable docker
Created symlink /etc/systemd/system/multi-user.target.wants/docker.service → /usr/lib/systemd/system/docker.service.
root@ip-172-31-35-246 ~]#
```

- Create One main directory “studentapp”

```
[root@ip-172-31-35-246 ~]# tree
.
└── studentapp
```

- Enter into “studentapp”, after entering into that directory create 2 directories
1. database, 2. backend

```
[root@ip-172-31-35-246 ~]# cd studentapp/
[root@ip-172-31-35-246 studentapp]# mkdir database
[root@ip-172-31-35-246 studentapp]# mkdir backend
[root@ip-172-31-35-246 studentapp]# tree
.
├── backend
└── database
```

- Enter into database directory and create 2 files “1. dockerfile & 2.student.sql”

```
[root@ip-172-31-35-246 studentapp]# cd database/
[root@ip-172-31-35-246 database]# touch dockerfile
[root@ip-172-31-35-246 database]# touch student.sql
[root@ip-172-31-35-246 database]# tree
.
├── dockerfile
└── student.sql
```

- Edit student.sql “vim student.sql”

```
[root@ip-172-31-35-246 database]# vim student.sql
[root@ip-172-31-35-246 database]# cat student.sql
create database studentapp;
use studentapp;
CREATE TABLE if not exists students(student_id INT NOT NULL AUTO_INCREMENT,
    student_name VARCHAR(100) NOT NULL,
    student_addr VARCHAR(100) NOT NULL,
    student_age VARCHAR(3) NOT NULL,
    student_qual VARCHAR(20) NOT NULL,
    student_percent VARCHAR(10) NOT NULL,
    student_year_passed VARCHAR(10) NOT NULL,
    PRIMARY KEY (student_id)
);
```

- Edit dockerfile “vim dockerfile”

```
FROM mariadb
LABEL database = "studentapp"
ENV MARIADB_ROOT_PASSWORD=1234
COPY student-rds.sql /docker-entrypoint-initdb.d/
CMD ["mariadb"]
```

- Build image “docker build -t db .”

```
[root@ip-172-31-35-246 database]# docker build -t db .
[+] Building 8.5s (7/7) FINISHED
=> [internal] load build definition from dockerfile
=> => transferring dockerfile: 240B
=> [internal] load metadata for docker.io/library/mariadb:latest
=> [internal] load .dockerignore
=> => transferring context: 2B
=> [internal] load build context
=> => transferring context: 520B
=> [1/2] FROM docker.io/library/mariadb:latest@sha256:4a1de8fa2a929944373d7421105500ff6f889ce90dcb883fbb2fdb070e4d4276
=> => resolve docker.io/library/mariadb:latest@sha256:4a1de8fa2a929944373d7421105500ff6f889ce90dcb883fbb2fdb070e4d4276
=> => sha256:4a1de8fa2a929944373d7421105500ff6f889ce90dcb883fbb2fdb070e4d427e 5.13kB / 5.13kB
=> => sha256:ffa476c95395cd3b4eb869267744494a9d0926308102070c8bd1367cefbb1842 2.48kB / 2.48kB
=> => sha256:4b8711c6c639fa9166e6a617c421e2fc43296c8add9a846fe8237b8ac9184d51 8.70kB / 8.70kB
=> => sha256:ff65ddf9395be21bfe1f320b7705e539ee44c1053034f801b1a3cbbf2d0f4056 29.75MB / 29.75MB
=> => sha256:d4d47b8d6ea097dcf6c6d64ef12fa26e71fd141d72991e8fd24229b45c708c6b 5.35MB / 5.35MB
=> => sha256:60bf5e4921ebf40cdeb9808d25882e73722afca373a3b3f38ecf24f105d817ea 1.34kB / 1.34kB
=> => sha256:e38fc7e50f91c37a0d822eeee9b8edc4a8fc386ca6db4709ec73ffdc15b1f52e 116B / 116B
=> => sha256:725acd03a3bc5090a20483353b8e4cd62df0a69d49d852ee5201a85b8622a092 329B / 329B
=> => sha256:db106334738c626481137264559382cb5bd33a57bd8ae1a08abc4190af7719fb 87.49MB / 87.49MB
=> => sha256:234171a3de7d7b4a5b3db938740204e157ec3d0d0ab13db1a9f7037f150d62d3 3.98kB / 3.98kB
=> => sha256:25efdea61d9c3a2a5455155d0ccf1fea3169802cae37cfa5bb07cb5708716961 8.42kB / 8.42kB
=> => extracting sha256:ff65ddf9395be21bfe1f320b7705e539ee44c1053034f801b1a3cbbf2d0f4056
=> => extracting sha256:60bf5e4921ebf40cdeb9808d25882e73722afca373a3b3f38ecf24f105d817ea
=> => extracting sha256:d4d47b8d6ea097dcf6c6d64ef12fa26e71fd141d72991e8fd24229b45c708c6b
=> => extracting sha256:e38fc7e50f91c37a0d822eeee9b8edc4a8fc386ca6db4709ec73ffdc15b1f52e
=> => extracting sha256:725acd03a3bc5090a20483353b8e4cd62df0a69d49d852ee5201a85b8622a092
=> => extracting sha256:db106334738c626481137264559382cb5bd33a57bd8ae1a08abc4190af7719fb
=> => extracting sha256:234171a3de7d7b4a5b3db938740204e157ec3d0d0ab13db1a9f7037f150d62d3
=> => extracting sha256:25efdea61d9c3a2a5455155d0ccf1fea3169802cae37cfa5bb07cb5708716961
=> [2/2] COPY student.sql /docker-entrypoint-initdb.d/
=> => exporting to image
=> => exporting layers
=> => writing image sha256:9919439f51b1fa714bb9189f0c19d36b9e4de7b8c3590a84beb9898ab95a5d07
=> => naming to docker.io/library/db
```

- Run container “docker run -itd - - name database_c1 -p 3306:3306 db”

```
[root@ip-172-31-35-246 database]# docker run -itd --name database_c1 -p 3306:3306 db
fa0b834b7fec82c57af3f43efb790d1ff45f8d84c836cac9c60cbece5356b8d
[root@ip-172-31-35-246 database]# docker images
REPOSITORY TAG IMAGE ID CREATED SIZE
db latest 9919439f51b1 About a minute ago 407MB
[root@ip-172-31-35-246 database]# docker ps
CONTAINER ID IMAGE COMMAND CREATED STATUS PORTS NAMES
fa0b834b7fec db "docker-entrypoint.s..." 11 seconds ago Up 9 seconds 0.0.0.0:3306->3306/tcp, :::3306->3306/tcp database_c1
```

- Copy database container IP “docker inspect container_id”
- Enter into backend directory and create 2 files “1. Dockerfile & 2. Context.xml”

```
[root@ip-172-31-35-246 backend]# touch dockerfile
[root@ip-172-31-35-246 backend]# touch context.xml
[root@ip-172-31-35-246 backend]# tree
```

```
├── context.xml
└── dockerfile
```

- Edit context.xml file “vim context.xml”

```

<!--
Licensed to the Apache Software Foundation (ASF) under one or more
contributor license agreements. See the NOTICE file distributed with
this work for additional information regarding copyright ownership.
The ASF licenses this file to You under the Apache License, Version 2.0
(the "License"); you may not use this file except in compliance with
the License. You may obtain a copy of the License at

    http://www.apache.org/licenses/LICENSE-2.0

Unless required by applicable law or agreed to in writing, software
distributed under the License is distributed on an "AS IS" BASIS,
WITHOUT WARRANTIES OR CONDITIONS OF ANY KIND, either express or implied.
See the License for the specific language governing permissions and
limitations under the License.
-->
<!-- The contents of this file will be loaded for each web application -->
<Context>
  <Resource name="jdbc/TestDB" auth="Container" type="javax.sql.DataSource"
    maxTotal="100" maxIdle="30" maxWaitMillis="10000"
    username="root" password="1234" driverClassName="com.mysql.jdbc.Driver"
    url="jdbc:mysql://172.17.0.2:3306/studentapp"/>
  <!-- Default set of monitored resources. If one of these changes, the -->
  <!-- web application will be reloaded. -->
  <WatchedResource>WEB-INF/web.xml</WatchedResource>
  <WatchedResource>${catalina.base}/conf/web.xml</WatchedResource>
  <!-- Uncomment this to disable session persistence across Tomcat restarts -->
  <!--
    <Manager pathname="" />
  -->
</Context>
-- INSERT --

```

- Edit dockerfile “vim dockerfile”

```

FROM ubuntu
USER root

# Update and install required packages
RUN apt update -y && \
    apt install default-jdk -y && \
    apt install unzip -y

# Set up the working directory
WORKDIR /opt/tomcat

# Download and extract Tomcat
ADD https://dlcdn.apache.org/tomcat/tomcat-9/v9.0.96/bin/apache-tomcat-9.0.96.zip /opt/tomcat/
RUN unzip apache-tomcat-9.0.96.zip -d /opt/tomcat && \
    rm apache-tomcat-9.0.96.zip

# Add student.war and MySQL connector
ADD https://s3-us-west-2.amazonaws.com/studentapi-cit/student.war /opt/tomcat/apache-tomcat-9.0.96/webapps/
ADD https://s3-us-west-2.amazonaws.com/studentapi-cit/mysql-connector.jar /opt/tomcat/apache-tomcat-9.0.96/lib/

# Copy context.xml to the correct location
COPY context.xml /opt/tomcat/apache-tomcat-9.0.96/conf/context.xml

# Grant execute permissions to catalina.sh
RUN chmod +x /opt/tomcat/apache-tomcat-9.0.96/bin/catalina.sh

# Expose Tomcat's default port
EXPOSE 8080

# Start Tomcat
CMD ["/opt/tomcat/apache-tomcat-9.0.96/bin/catalina.sh", "run"]

```

- Build image “docker build -t tomcat .”

```
[root@ip-172-31-35-246 backend]# docker build -t tomcat .
[+] Building 73.3s (17/17) FINISHED                                docker:default
=> [internal] load build definition from dockerfile
=> => transferring dockerfile: 1.1kB
=> [internal] load metadata for docker.io/library/ubuntu:latest
=> [internal] load .dockerignore
=> => transferring context: 2B
=> [1/9] FROM docker.io/library/ubuntu:latest@sha256:99c35190e22d294cdace2783ac55effc69d32896daaa265f0bbdbcd4fba3e5
=> => resolve docker.io/library/ubuntu:latest@sha256:99c35190e22d294cdace2783ac55effc69d32896daaa265f0bbdbcd4fba3e5
=> => sha256:99c35190e22d294cdace2783ac55effc69d32896daaa265f0bbdbcd4fba3e5 6.69kB / 6.69kB
=> => sha256:5d070ad5f77fed3522bb9994fc0f6997f5591203d4803ccce50f4039570ddde4_42kB / 42kB
=> => sha256:59ab366372d56772ab54e426183435eb0642152cb449ec7ab52473af8ca6a3f 2.30kB / 2.30kB
=> [internal] load build context
=> => transferring context: 1.68kB
=> https://s3-us-west-2.amazonaws.com/studentapi-cit/mysql-connector.jar
=> https://s3-us-west-2.amazonaws.com/studentapi-cit/student.war
=> https://d1cdn.apache.org/tomcat/tomcat-9/v9.0.96/bin/apache-tomcat-9.0.96.zip
=> [2/9] RUN apt update -y && apt install default-jdk -y && apt install unzip -y
=> [3/9] WORKDIR /opt/tomcat
=> [4/9] ADD https://d1cdn.apache.org/tomcat/tomcat-9/v9.0.96/bin/apache-tomcat-9.0.96.zip /opt/tomcat/
=> [5/9] RUN unzip apache-tomcat-9.0.96.zip -d /opt/tomcat && rm apache-tomcat-9.0.96.zip
=> [6/9] ADD https://s3-us-west-2.amazonaws.com/studentapi-cit/student.war /opt/tomcat/apache-tomcat-9.0.96/webapps/
=> [7/9] ADD https://s3-us-west-2.amazonaws.com/studentapi-cit/mysql-connector.jar /opt/tomcat/apache-tomcat-9.0.96/lib/
=> [8/9] COPY context.xml /opt/tomcat/apache-tomcat-9.0.96/conf/context.xml
=> [9/9] RUN chmod +x /opt/tomcat/apache-tomcat-9.0.96/bin/catalina.sh
=> exporting to image
=> => exporting layers
=> => writing image sha256:64d9fecdf9c1c8a1c5618babe33a7b0d6e32e605e0e4b133ffed3976ab11942c
=> => naming to docker.io/library/tomcat
```

- Run container “docker run -itd --name tomcat_c2 -p 8080:8080 tomcat

```
[root@ip-172-31-35-246 backend]# docker run -itd --name tomcat_c2 -p 8080:8080 tomcat
c62a7b1ceced18ea72884a3dda70cd5bdc5ec3e76a4233b6e9db20ab54725f93
```

- Now hit “public_ip:8080/student”

Student Registration Form

Student Name

Rutugandh shete

Student Address

pune

Student Age

20

Student Qualification

12

Student Percentage

67

Year Passed

2020

register

[Register Student](#)

Students List

Student ID	StudentName	Student Addr	Student Age	Student Qualification	Student Percentage	Student Year Passed	Edit	Delete
1	Rutugandh shete	pune	20	12	67	2020	edit	delete