DOCKER(TWO TIER PROJECT)

Step I : Launch instance using http,ssh,mysql,all tcp allow this port in our Ec2 instance.

Step II : after connecting instance, install docker using “yum install docker -y” command, then start docker using “systemctl start docker”.

```
[ec2-user@ip-172-31-31-40 ~]$ sudo su
[root@ip-172-31-31-40 ec2-user]# yum install docker -y
```

```
Complete!
[root@ip-172-31-31-40 ec2-user]# systemctl start docker
[root@ip-172-31-31-40 ec2-user]# systemctl enable docker
Created symlink /etc/systemd/system/multi-user.target.wants/docker.service → /usr/lib/systemd/system/docker.
```

Step III : we need mysql image for database pull the mysql image using “docker pull mysql”.

```
reated symlink /etc/systemd/system/multi-user.target.wants/doc
root@ip-172-31-31-40 ec2-user]# docker pull mysql
sing default tag: latest
atest: Pulling from library/mysql
2ba873cb070a: Pull complete
```

Step IV : to see image hit ‘‘docker images”

```
[root@ip-172-31-31-40 ec2-user]# docker images
REPOSITORY   TAG       IMAGE ID       CREATED       SIZE
mysql        latest    65f3f983cb08   3 weeks ago   632MB
[root@ip-172-31-31-40 ec2-user]#
```

Step V : Create and run mysql Container using “docker run -d -p 3306:3306 -e MYSQL_ROOT_PASSWORD=1234 --name mysql_container mysql” .

```
[root@ip-172-31-31-40 ec2-user]# docker run -d -p 3306:3306 -e MYSQL_ROOT_PASSWORD=1234 --name mysql_contain
6c69ea43d9ecc28d753a4860a883b65a51da502c53ab28ef21c82689d19a1c6c
```

Step VI : to see running container use “docker ps” command.

```
root@ip-172-31-31-40 ec2-user]# docker ps
ONTAINER ID   IMAGE     COMMAND                  CREATED          STATUS          PORTS
c69ea43d9ec   mysql     "docker-entrypoint.s…"   54 seconds ago   Up 52 seconds   0.0.0.0:3306->3306/tcp, ::
```

Step VII : then enter the container using “docker exec -it container(name/id) /bin/bash” .

```
[root@ip-172-31-31-40 ec2-user]# docker exec -it mysql_container /bin/bash
bash-4.4#
```

Step VIII : then hit “mysql -u root -p1234” for enter in mysql.

```
bash-4.4# mysql -u root -p1234
mysql: [Warning] Using a password on the command line interface can be insecure.
Welcome to the MySQL monitor.  Commands end with ; or \g.
Your MySQL connection id is 8
Server version: 8.3.0 MySQL Community Server - GPL

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owners.

Type 'help;' or '\h' for help. Type '\c' to clear the current input statement.

mysql>
```

Step IX: then create Database using above commands, “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)

);

```
mysql> create database studentapp;
Query OK, 1 row affected (0.00 sec)

mysql> use studentapp;
Database changed
mysql> 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)
    -> );
Query OK, 0 rows affected (0.03 sec)
```

Step X : to see table structure use “desc students”.

```
mysql> desc students;
+--------------------+--------------+------+-----+---------+----------------+
| Field              | Type         | Null | Key | Default | Extra          |
+--------------------+--------------+------+-----+---------+----------------+
| student_id         | int          | NO   | PRI | NULL    | auto_increment |
| student_name       | varchar(100) | NO   |     | NULL    |                |
| student_addr       | varchar(100) | NO   |     | NULL    |                |
| student_age        | varchar(3)   | NO   |     | NULL    |                |
| student_qual       | varchar(20)  | NO   |     | NULL    |                |
| student_percent    | varchar(10)  | NO   |     | NULL    |                |
| student_year_passed | varchar(10) | NO   |     | NULL    |                |
+--------------------+--------------+------+-----+---------+----------------+
7 rows in set (0.00 sec)

mysql>
```

Step XI : then using “exit” exit from mysql.

```
mysql> exit
Bye
```

Step XII : using “docker inspect container_name” it will provide you IP address assigned to your mysql container.

```
root@ip-172-31-31-40 ec2-user]# docker inspect mysql_container

  {
      "Id": "6c69ea43d9ecc28d753a4860a883b65a51da502c53ab28ef21c82689d19a1c6c",
      "Created": "2024-04-16T03:59:22.768466166Z",
      "Path": "docker-entrypoint.sh",
      "Args": [
          "mysqld"
```

Using “ctrl+p+q” exit from running container without stopping it.

Step XIII : Now we have to host the application using tomcat.

Step XIV : for that we need centos 7 image .using “docker run -it -p 8080:8080 centos:7” it will pull the image and we will enter in container.

```
[root@ip-172-31-31-40 ec2-user]# docker run -it -p 8080:8080 centos:7
Unable to find image 'centos:7' locally
7: Pulling from library/centos
2d473b07cdd5: Pull complete
Digest: sha256:be65f488b7764ad3638f236b7b515b3678369a5124c47b8d32916d6487418ea4
Status: Downloaded newer image for centos:7
```

Step XV : then change directory and go to opt directory using “cd opt”

Step XVI : download the apache-tomcat using above command ““curl -O https://dlcdn.apache.org/tomcat/tomcat9/v9.0.87/bin/apache-tomcat-9.0.87.tar.gz”.

```
[root@9315ea2e6714 opt]# curl -O https://dlcdn.apache.org/tomcat/tomcat-9/v9.0.87/bin/apache-tomcat-9.0.87.tar.gz
  % Total    % Received % Xferd  Average Speed   Time    Time     Time  Current
                                 Dload  Upload   Total   Spent    Left  Speed
00 11.1M  100 11.1M    0     0  31.1M      0 --:--:-- --:--:-- --:--:-- 31.1M
```

Step XVII: Extract it using “ tar -xvf apache-tomcat-9.0.87.tar.gz”.

```
[root@9315ea2e6714 opt]# tar -xvf apache-tomcat-9.0.87.tar.gz
apache-tomcat-9.0.87/conf/
apache-tomcat-9.0.87/conf/catalina.policy
```

Step XVIII: using above command download student.war file “ curl -O https://tiiibucket.s3.amazonaws.com/student.war”.

```
[root@9315ea2e6714 opt]# tar -xvf apache-tomcat-9.0.87.tar.gz
apache-tomcat-9.0.87/conf/
apache-tomcat-9.0.87/conf/catalina.policy
```

Step XIX : also download “curl -O https://webapp-akash.s3.amazonaws.com/mysqlconnector-j-8.3.0.jar” to download the connector file.

```
root@9315ea2e6714 opt]# curl -O https://webapp-akash.s3.amazonaws.com/mysql-connector-j-8.3.0.jar
  % Total    % Received % Xferd  Average Speed   Time    Time     Time  Current
                                 Dload  Upload   Total   Spent    Left  Speed
100 2437k  100 2437k    0     0  8225k      0 --:--:-- --:--:-- --:--:-- 8233k
```

Step XX : now move student.war file /webapps/ and mysql-connector jar in /lib/.

```
[root@9315ea2e6714 opt]# mv student.war apache-tomcat-9.0.87/webapps/
[root@9315ea2e6714 opt]# mv mysql-connector-j-8.3.0.jar apache-tomcat-9.0.87/lib/
```

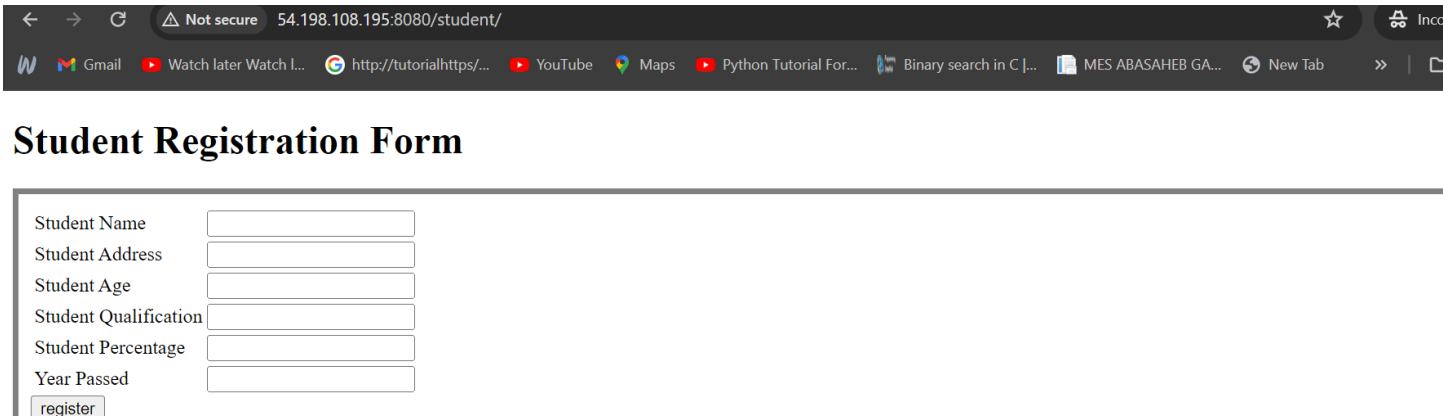
Step XXI : for Tomcat we need java using “yum install java -y’ install java.

```
root@9315ea2e6714 opt]# yum install java -y
```

Step XXII: then start Catalina.sh using “apache-tomcat/bin/catalina.sh start

```
[root@9315ea2e6714 opt]# apache-tomcat-9.0.87/bin/catalina.sh start
Using CATALINA_BASE:   /opt/apache-tomcat-9.0.87
Using CATALINA_HOME:   /opt/apache-tomcat-9.0.87
Using CATALINA_TMPDIR: /opt/apache-tomcat-9.0.87/temp
Using JRE_HOME:        /usr
Using CLASSPATH:       /opt/apache-tomcat-9.0.87/bin/bootstrap.jar:/opt/apache-tomcat-9.0.87/bin/tomcat-juli
Using CATALINA_OPTS:
Tomcat started.
```

Step XXIII : now hit the public IP :8080/student on other browser and see the registration page.



Step XXIV : now we have too configure data for saved to database go to context.xml file and add above changes in it.

```
[root@9315ea2e6714 opt]# vi apache-tomcat-9.0.87/conf/context.xml
```

Step XXV : give mysql container ip/database_name".

```
<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"/>
```

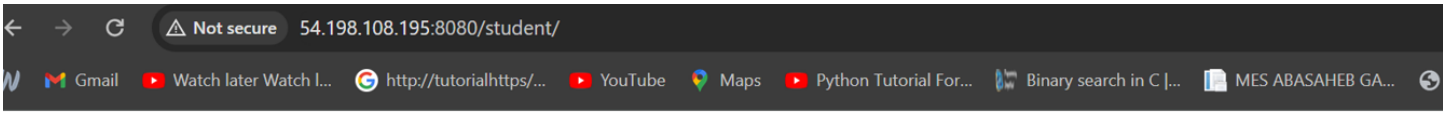
Step XXVI : then stop the Catalina.sh using "./apache-tomcat-9.0.87/bin/Catalina.sh stop" .

```
[root@9315ea2e6714 opt]# apache-tomcat-9.0.87/bin/catalina.sh stop
Using CATALINA_BASE:   /opt/apache-tomcat-9.0.87
Using CATALINA_HOME:   /opt/apache-tomcat-9.0.87
Using CATALINA_TMPDIR: /opt/apache-tomcat-9.0.87/temp
Using JRE_HOME:        /usr
Using CLASSPATH:       /opt/apache-tomcat-9.0.87/bin/bootstrap.jar:/opt/apache-tomcat-9.0.87/bin/tomcat-juli
Using CATALINA_OPTS:
```

Step XXVII: then again start the Catalina using "./apache-tomcat-9.0.87/bin/Catalina.sh start" .

```
[root@9315ea2e6714 opt]# apache-tomcat-9.0.87/bin/catalina.sh start
Using CATALINA_BASE:   /opt/apache-tomcat-9.0.87
Using CATALINA_HOME:   /opt/apache-tomcat-9.0.87
Using CATALINA_TMPDIR: /opt/apache-tomcat-9.0.87/temp
Using JRE_HOME:        /usr
Using CLASSPATH:       /opt/apache-tomcat-9.0.87/bin/bootstrap.jar:/opt/apache-tomcat-9.0.87/bin/tomcat-juli
Using CATALINA_OPTS:
Tomcat started.
[root@9315ea2e6714 opt]#
```

Step XXVIII: then again hit the ip in browser.

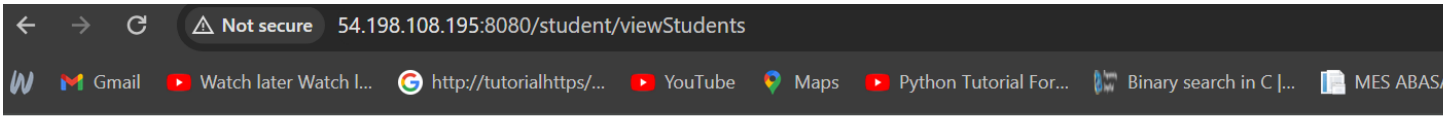


Student Registration Form

Student Name	Apurva
Student Address	Shirur
Student Age	21
Student Qualification	MCS
Student Percentage	89
Year Passed	2025

register

Step XXIX : see here, data saved successfully.



Register Student

Students List

Student ID	StudentName	Student Addrs	Student Age	Student Qualification	Student Percentage
1	Apurva	Shirur	21	MCS	89