Experiment No. 07

AIM: To study and implement Docker basics

THEORY:

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Containerization is a lightweight virtualization technique that allows applications to run in isolated environments called containers. Unlike traditional virtual machines, containers share the host operating system's kernel, making them more efficient and faster to start. Docker is one of the most popular platforms for containerization.

Docker allows developers to package an application along with all its dependencies, libraries, and configuration files into a single unit called a Docker container. This ensures the application runs consistently across different environments—whether it's development, testing, or production. Docker uses a file called a *Dockerfile* to automate the creation of images, which are then used to spin up containers.

With Docker, scaling applications becomes simpler, and deployment is faster and more reliable. It also helps in reducing conflicts between environments and improves CI/CD pipelines.

In this experiment, we aim to understand how Docker works, how to build Docker images, and how to run and manage containers. Through hands-on implementation, we'll explore Docker commands and learn how containerization can streamline development workflows.

IMPLEMENTATION:



```
/d/MiscRepos/sepm_lab/flles glt:(master)±9 (16.855s)

docker pull nginx

Using default tag: latest
latest: Pull complete
97f5c0f51d43: Pull complete
52ea34f5b92: Pull complete
417c4bccf534: Pull complete
417c4bccf534: Pull complete
22eb46e871a: Pull complete
2373fe654e984: Pull complete
Digest: sha256:1224b44bfc9ccd1f3cedf4b592d4d1e8bddb78b51ec2ed5056c52d3692baebc19
Status: Downloaded newer image for nginx:latest

docker.io/library/nginx:latest

/d/MiscRepos/sepm_lab/flles glt:(master)±9 (1.127s)
docker tmages

/d/MiscRepos/sepm_lab/flles glt:(master)±9 (1.127s)
docker inages

/d/MiscRepos/sepm_lab/flles glt:(master)±9 (1.127s)
/docker inages

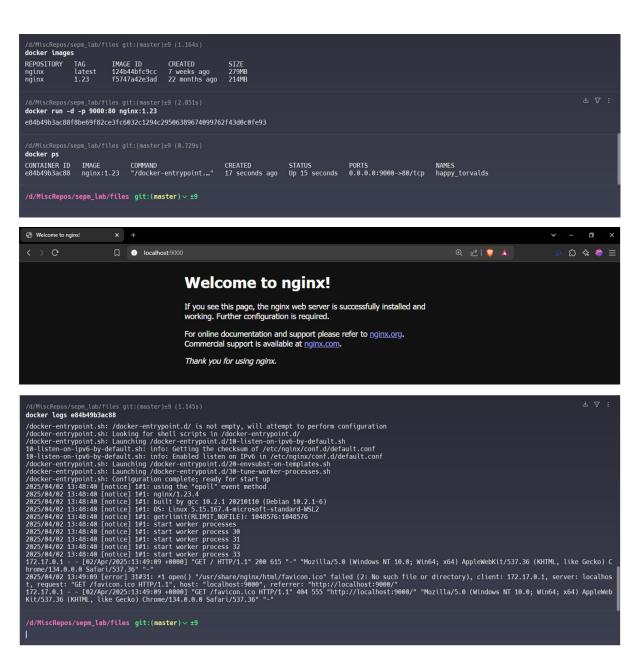
/d/MiscRepos/sepm_lab/flles glt:(master)±9 (1.127s)
/docker inages
/docker inages
/docker inages
/d/MiscRepos/sepm_lab/flles glt:(master)±9 (1.127s)
/docker inages
/docker in
```

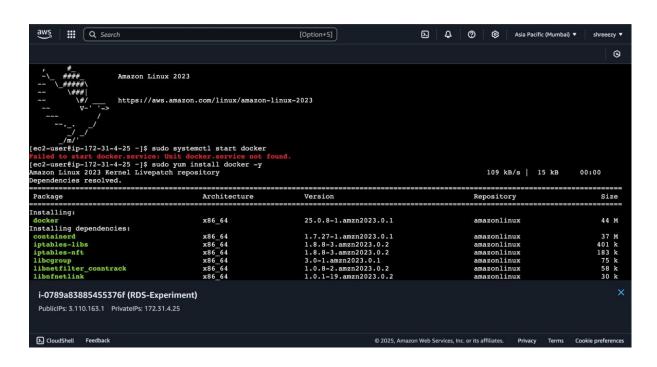
```
docker run nginx:1.23

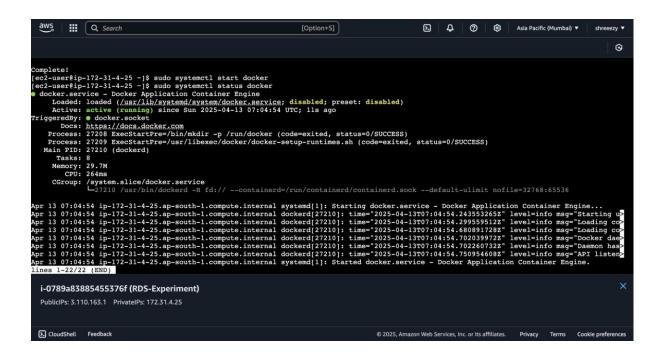
/docker-entrypoint.sh: /docker-entrypoint.d/ is not empty, will attempt to perform configuration
/docker-entrypoint.sh: Looking for shell scripts in /docker-entrypoint.d/
/docker-entrypoint.sh: Launching /docker-entrypoint.d/locker-entrypoint.sh: Launching /docker-entrypoint.d/locker-entrypoint.sh: Launching /docker-entrypoint.d/locker-entrypoint.d/locker-entrypoint.sh: Launching /docker-entrypoint.d/locker-entrypoint.d/locker-entrypoint.sh: Launching /docker-entrypoint.d/locker-entrypoint.sh: Launching /docker-entrypoint.d/locker-entrypoint.sh: Launching /docker-entrypoint.d/locker-entrypoint.sh: Configuration complete; ready for start up
2025/04/02 13:34:51 [notice] ##1: using the "epoll" event method
2025/04/02 13:34:51 [notice] ##1: suing the "epoll" event method
2025/04/02 13:34:51 [notice] ##1: Using the "epoll" event method
2025/04/02 13:34:51 [notice] ##1: start worker processes
2025/04/02 13:34:51 [notice] ##1: start worker processes
2025/04/02 13:34:51 [notice] ##1: start worker processes
2025/04/02 13:34:51 [notice] ##1: start worker processes 30
2025/04/02 13:34:51 [notice] ##1: start worker process 31
2025/04/02 13:34:51 [notice] ##1: start worker process 31
2025/04/02 13:34:51 [notice] ##1: start worker process 32
```

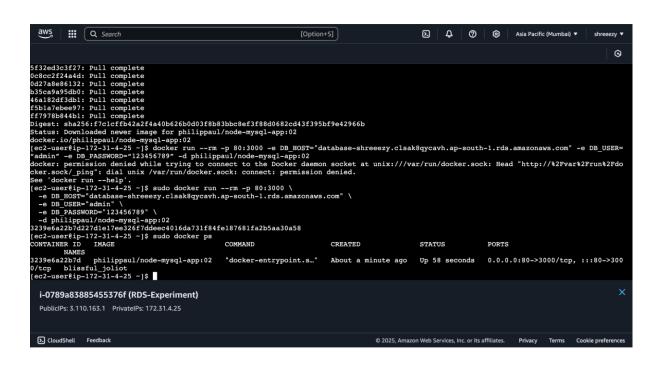
```
/d/MiscRepos/sepm_lab/files git:(master)±9 (2.813s)
docker run -d nginx:1.23
  a8c8bd4b3b4912b37e3d407427e975a56fd722df027f0012e2c03c4199f77291
  docker ps
  CONTAINER ID IMAGE COMMAND CREATED STATUS PORTS NAMES a8c8bd4b3b49 nginx:1.23 "/docker-entrypoint..." 8 seconds ago Up 6 seconds 80/tcp amazing_jepsen
  /d/MiscRepos/sepm_lab/files git:(master)±9 (0.647s)
docker logs a8c8bd4b3b49
docker logs a8c8bd4b3b49

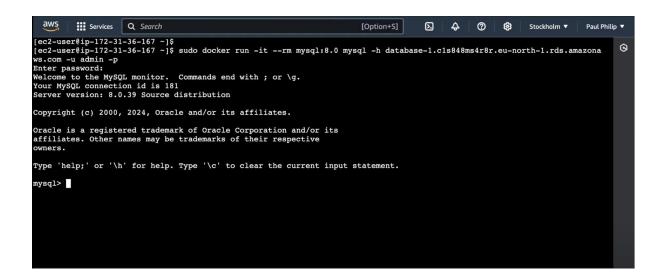
/docker-entrypoint.sh: /docker-entrypoint.d/ is not empty, will attempt to perform configuration /docker-entrypoint.sh: Looking for shell scripts in /docker-entrypoint.d/
/docker-entrypoint.sh: Louking for shell scripts in /docker-entrypoint.d/
/docker-entrypoint.sh: Launching /docker-entrypoint.d/10-listen-on-ipv6-by-default.sh info: Fabled listen on TPv6 in /etc/nginx/conf.d/default.conf
10-listen-on-ipv6-by-default.sh: info: Fabled listen on TPv6 in /etc/nginx/conf.d/default.conf
/docker-entrypoint.sh: Launching /docker-entrypoint.d/20-envsubst-on-templates.sh
/docker-entrypoint.sh: Launching /docker-entrypoint.d/30-tune-worker-processes.sh
/docker-entrypoint.sh: Configuration complete; ready for start up
2025/94/02 13:40:12 [notice] 1#1: using the "epoll" event method
2025/94/02 13:40:12 [notice] 1#1: built by gcc 10.2.1 20210110 (Debian 10.2.1-6)
2025/94/02 13:40:12 [notice] 1#1: getrlimit(RLIMIT_NOFILE): 1048576:1048576
2025/94/02 13:40:12 [notice] 1#1: start worker processes
2025/94/02 13:40:12 [notice] 1#1: start worker process 30
2025/94/02 13:40:12 [notice] 1#1: start worker process 31
2025/94/02 13:40:12 [notice] 1#1: start worker process 32
    /d/MiscRepos/sepm_lab/files git:(master) \sim \pm 9
  /d/MiscRepos/sepm_lab/files git:(master)±9
docker run nginx:latest
docker run nginx:latest
/docker-entrypoint.sh: /docker-entrypoint.d/ is not empty, will attempt to perform configuration
/docker-entrypoint.sh: Looking for shell scripts in /docker-entrypoint.d/
/docker-entrypoint.sh: Looking for shell scripts in /docker-entrypoint.d/
/docker-entrypoint.sh: Launching /docker-entrypoint.d/10-listen-on-ipv6-by-default.sh
10-listen-on-ipv6-by-default.sh: info: Enabled listen on IPv6 in /tet/nginx/conf.d/default.conf
10-listen-on-tpv6-by-default.sh: info: Enabled listen on IPv6 in /tet/nginx/conf.d/default.conf
/docker-entrypoint.sh: Sourcing /docker-entrypoint.d/15-local-resolvers.envsh
/docker-entrypoint.sh: Launching /docker-entrypoint.d/20-envsubst-on-templates.sh
/docker-entrypoint.sh: Launching /docker-entrypoint.d/30-tune-worker-processes.sh
/docker-entrypoint.sh: Configuration complete; ready for start up
2025/04/02 13:43:21 [notice] 1#1: using the "epoll" event method
2025/04/02 13:43:21 [notice] 1#1: built by gcc 12.2.0 (Debian 12.2.0-14)
2025/04/02 13:43:21 [notice] 1#1: Start worker processes
2025/04/02 13:43:21 [notice] 1#1: start worker processes
2025/04/02 13:43:21 [notice] 1#1: start worker process 30
2025/04/02 13:43:21 [notice] 1#1: start worker process 31
2025/04/02 13:43:21 [notice] 1#1: start worker process 32
  docker ps
  CONTAINER ID IMAGE COMMAND CREATED STATUS PORTS NAMES b59407459184 nginx:latest "/docker-entrypoint..." 11 seconds ago Up 10 seconds 80/tcp intelligent_beaver a8c8bd4b3b49 nginx:1.23 "/docker-entrypoint..." 3 minutes ago Up 3 minutes 80/tcp amazing_jepsen
    /d/MiscRepos/sepm_lab/files git:(master) < ±9
    docker ps
    CONTAINER ID IMAGE COMMAND CREATED STATUS PORTS NAMES a8c8bd4b3b49 nginx:1.23 "/docker-entrypoint..." 6 minutes ago Up 6 minutes 80/tcp amazing_jepsen
    /d/MiscRepos/sepm_lab/files git:(master)±9 (1.199s) docker stop a8c8bd4b3b49
    a8c8bd4b3b49
  /d/MiscRepos/sepm_lab/files git:(master)±9 (0.668s) docker ps
    CONTAINER ID IMAGE COMMAND CREATED STATUS PORTS NAMES
    /d/MiscRepos/sepm_lab/files git:(master) \lor \pm 9
```

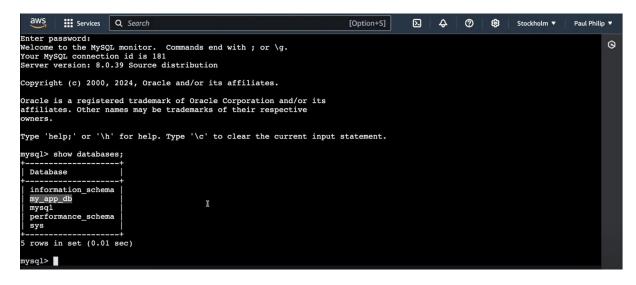


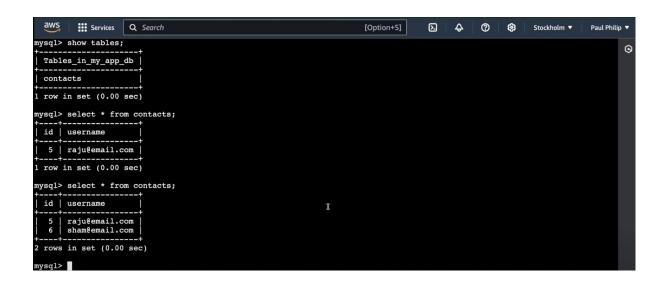


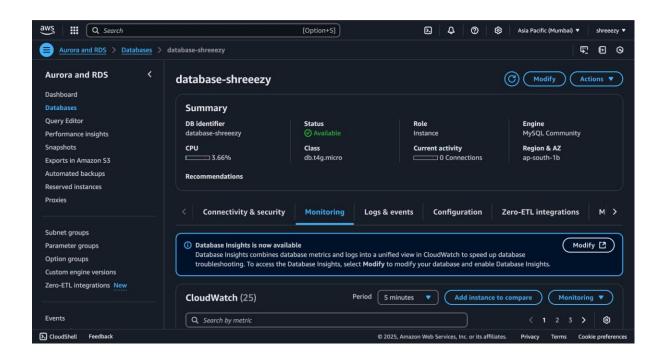












CONCLUSION: Hence, we have successfully studied and implemented the basics of Docker.