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Subject : Microservice Architecture and programming

Practical 1:

Definition
1. Learn Git related commands about how to create project and manage it on Git environment
locally as well as on GitHub/Gitlab.
Capture necessary screens for the work you are doing for the submission with few lines of writeup in your own terms.
2. You are expected to learn basics of Docker and the commands to work with it, use the Docker
playground for the same.
For this you will need to create your account on Docker.com and follow the instructions on this
URL, and use (Alpine Image of Linux - primary experimentation).
https://training.play-with-docker.com/ops-s1-hello

1. Play with Docker classroom

```
[node1] (local) root@192.168.0.28 ~
$ uname -a
Linux node1 4.4.0-210-generic #242-Ubuntu SMP Fri Apr 16 09:57:56 UTC 2021 x86_64
 Linux
```

Steps: 1.Running the first Container

```
[node1] (local) root@192.168.0.28 ~
$ docker container run hello-world
Unable to find image 'hello-world:latest' locally
latest: Pulling from library/hello-world
719385e32844: Pull complete
Digest: sha256:dcba6daec718f547568c562956fa47e1b03673dd010fe6ee58ca806767031d1c
Status: Downloaded newer image for hello-world:latest

Hello from Docker!
This message shows that your installation appears to be working correctly.

To generate this message, Docker took the following steps:
 1. The Docker client contacted the Docker daemon.
 2. The Docker daemon pulled the "hello-world" image from the Docker Hub.
    (amd64)
 3. The Docker daemon created a new container from that image which runs the
    executable that produces the output you are currently reading.
 4. The Docker daemon streamed that output to the Docker client, which sent it
    to your terminal.

To try something more ambitious, you can run an Ubuntu container with:
 $ docker run -it ubuntu bash
```

2. Pull Alpine Test Container

```
[node1] (local) root@192.168.0.28 ~
$ docker image pull alpine
Using default tag: latest
latest: Pulling from library/alpine
7264a8db6415: Pull complete
Digest: sha256:7144f7bab3d4c2648d7e59409f15ec52a18006a128c733fcff20d3a4a54ba44a
Status: Downloaded newer image for alpine:latest
docker.io/library/alpine:latest
```

3.list down the all containers

```
[node1] (local) root@192.168.0.28 ~
$ docker image ls
REPOSITORY    TAG       IMAGE ID       CREATED         SIZE
alpine        latest    7e01a0d0a1dc   2 weeks ago     7.34MB
hello-world   latest    9c7a54a9a43c   3 months ago    13.3kB
```

4.Run Alpine Container

```
[node1] (local) root@192.168.0.28 ~
$ docker container run alpine ls -l
total 8
drwxr-xr-x    2 root     root          4096 Aug  7 13:09 bin
drwxr-xr-x    5 root     root           340 Aug 26 16:11 dev
drwxr-xr-x    1 root     root            66 Aug 26 16:11 etc
drwxr-xr-x    2 root     root             6 Aug  7 13:09 home
drwxr-xr-x    7 root     root           243 Aug  7 13:09 lib
drwxr-xr-x    5 root     root            44 Aug  7 13:09 media
drwxr-xr-x    2 root     root             6 Aug  7 13:09 mnt
drwxr-xr-x    2 root     root             6 Aug  7 13:09 opt
dr-xr-xr-x  510 root     root             0 Aug 26 16:11 proc
drwx------    2 root     root             6 Aug  7 13:09 root
drwxr-xr-x    2 root     root             6 Aug  7 13:09 run
drwxr-xr-x    2 root     root          4096 Aug  7 13:09 sbin
drwxr-xr-x    2 root     root             6 Aug  7 13:09 srv
dr-xr-xr-x   13 root     root             0 Aug 24 06:05 sys
drwxrwxrwt    2 root     root             6 Aug  7 13:09 tmp
drwxr-xr-x    7 root     root            66 Aug  7 13:09 usr
drwxr-xr-x   12 root     root           137 Aug  7 13:09 var
```

5.echo command

```
[node1] (local) root@192.168.0.28 ~
$ docker container run alpine echo "hello from alpine"
hello from alpine
```

6.run command

```
[node1] (local) root@192.168.0.28 ~
$ docker container run alpine /bin/sh
```

```
[node1] (local) root@192.168.0.28 ~
$ docker container run -it alpine /bin/ash
/ #  echo "hello world" > hello.txt
/ # ls
bin         etc         home        media       opt         root        sbin        sys         usr
dev         hello.txt   lib         mnt         proc        run         srv         tmp         var
/ #
```

7.list all Containers

```
[node1] (local) root@192.168.0.28 ~
$ docker container ls
CONTAINER ID   IMAGE     COMMAND   CREATED   STATUS    PORTS     NAMES
```

8.View Containers status

```
[node1] (local) root@192.168.0.28 ~
$ docker container ls -a
CONTAINER ID   IMAGE         COMMAND                  CREATED          STATUS
PORTS     NAMES
8c1a46e465d3   alpine        "/bin/ash"               8 minutes ago    Exited (127) 16 seconds ago
          recursing_mahavira
2e8d0e36ec40   alpine        "/bin/sh"                14 minutes ago   Exited (0) 14 minutes ago
          happy_blackburn
894d1fd3f698   alpine        "echo 'hello from al…"   15 minutes ago   Exited (0) 15 minutes ago
          peaceful_villani
be0b1854deb6   alpine        "ls -l"                  17 minutes ago   Exited (0) 17 minutes ago
          nervous_golick
0f267d41a5f8   hello-world   "/hello"                 36 minutes ago   Exited (0) 36 minutes ago
          festive_cartwright
```

9.Container Isolation

```
[node1] (local) root@192.168.0.28 ~
$ docker container run alpine ls
bin
dev
etc
home
lib
media
mnt
opt
proc
root
run
sbin
srv
sys
tmp
usr
var
```

```
$ docker container run -it alpine /bin/ash
Unable to find image 'alpine:latest' locally
latest: Pulling from library/alpine
7264a8db6415: Pull complete
Digest: sha256:7144f7bab3d4c2648d7e59409f15ec52a18006a128c733fcff20d3a4a54ba
44a
Status: Downloaded newer image for alpine:latest
```

```
[node1] (local) root@192.168.0.28 ~
$ docker container ls -a
CONTAINER ID   IMAGE         COMMAND                  CREATED          STATUS
PORTS     NAMES
c7220e49c8ba   alpine        "ls"                     29 seconds ago   Exited (0) 28 seconds ago
          sharp_mendel
d9d603426413   alpine        "/bin/ash"               3 minutes ago    Exited (0) 40 seconds ago
          dazzling_curie
8c1a46e465d3   alpine        "/bin/ash"               23 minutes ago   Exited (127) 14 minutes ago
          recursing_mahavira
2e8d0e36ec40   alpine        "/bin/sh"                29 minutes ago   Exited (0) 29 minutes ago
          happy_blackburn
894d1fd3f698   alpine        "echo 'hello from al…"   30 minutes ago   Exited (0) 30 minutes ago
          peaceful_villani
be0b1854deb6   alpine        "ls -l"                  32 minutes ago   Exited (0) 32 minutes ago
          nervous_golick
0f267d41a5f8   hello-world   "/hello"                 51 minutes ago   Exited (0) 51 minutes ago
          festive_cartwright
```

10.Start and Execute Container

```
[node1] (local) root@192.168.0.18 ~
$ docker container start ea520dcd9d46
ea520dcd9d46
[node1] (local) root@192.168.0.18 ~
$ docker container exec ea520dcd9d46 ls
bin
dev
etc
home
lib
media
mnt
opt
proc
root
run
sbin
srv
sys
tmp
usr
var
```

2.Git Related Commands

1.Initialize a new Git repository

```
ABCD@LAPTOP-AVJC0KDS MINGW64 /e/sem-7/MAP/prac_1/API
$ git init
Initialized empty Git repository in E:/sem-7/MAP/prac_1/API/.git/

ABCD@LAPTOP-AVJC0KDS MINGW64 /e/sem-7/MAP/prac_1/API (master)
$ git config user.name tirth

ABCD@LAPTOP-AVJC0KDS MINGW64 /e/sem-7/MAP/prac_1/API (master)
$ git config user.email tirthchavda33@gmail.com
```

2. Create and Manage Files

```
ABCD@LAPTOP-AVJC0KDS MINGW64 /e/sem-7/MAP/prac_1/API (master)
$ git add .

ABCD@LAPTOP-AVJC0KDS MINGW64 /e/sem-7/MAP/prac_1/API (master)
$ git commit -m "first commit"
[master (root-commit) 6c09e90] first commit
 6 files changed, 535 insertions(+)
 create mode 100644 app.py
 create mode 100644 app1.py
 create mode 100644 app2.py
 create mode 100644 app3.py
 create mode 100644 app4.py
 create mode 100644 app5.py
```

3. Creating new Repository and connect local repository to remote

```
ABCD@LAPTOP-AVJC0KDS MINGW64 /e/sem-7/MAP/prac_1/API (master)
$ git remote add origin "https://github.com/tirth5/microservice1.git"

ABCD@LAPTOP-AVJC0KDS MINGW64 /e/sem-7/MAP/prac_1/API (master)
$ git remote -v
origin  https://github.com/tirth5/microservice1.git (fetch)
origin  https://github.com/tirth5/microservice1.git (push)
```

4. Push Local Commits to Remote

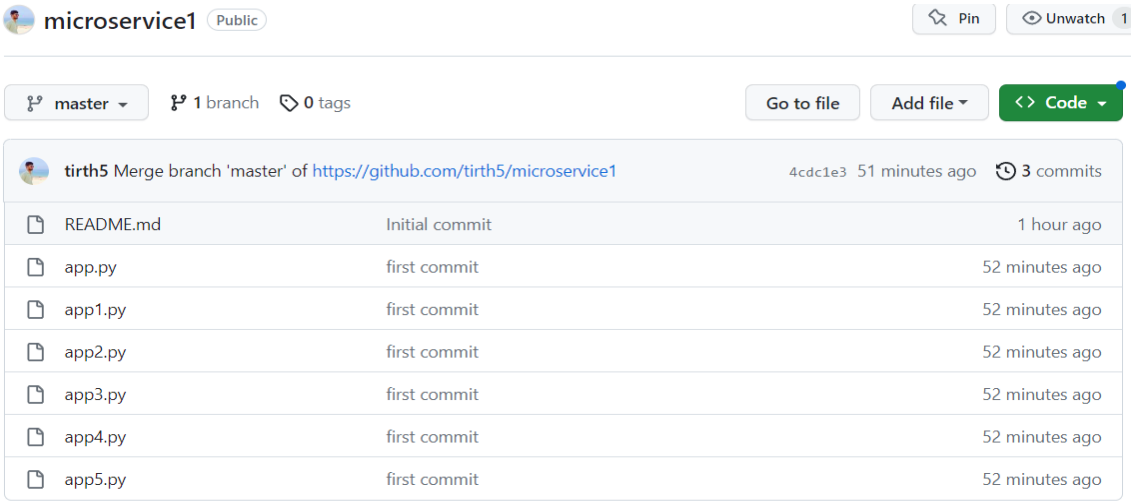
```
ABCD@LAPTOP-AVJC0KDS MINGW64 /e/sem-7/MAP/prac_1/API (master)
$ git pull origin master --allow-unrelated-histories
remote: Enumerating objects: 3, done.
remote: Counting objects: 100% (3/3), done.
remote: Total 3 (delta 0), reused 0 (delta 0), pack-reused 0
Unpacking objects: 100% (3/3), 597 bytes | 2.00 KiB/s, done.
From https://github.com/tirth5/microservice1
 * branch            master     -> FETCH_HEAD
 * [new branch]      master     -> origin/master
Merge made by the 'ort' strategy.
 README.md | 1 +
 1 file changed, 1 insertion(+)
 create mode 100644 README.md
```

```
ABCD@LAPTOP-AVJC0KDS MINGW64 /e/sem-7/MAP/prac_1/API (master)
$ git push origin master
info: please complete authentication in your browser...
Enumerating objects: 11, done.
Counting objects: 100% (11/11), done.
Delta compression using up to 4 threads
Compressing objects: 100% (10/10), done.
Writing objects: 100% (10/10), 1.97 KiB | 1008.00 KiB/s, done.
Total 10 (delta 6), reused 0 (delta 0), pack-reused 0
remote: Resolving deltas: 100% (6/6), done.
To https://github.com/tirth5/microservice1.git
   c50d4a2..4cdc1e3  master -> master
```

5. Manage Branches

```
ABCD@LAPTOP-AVJC0KDS MINGW64 /e/sem-7/MAP/prac_1/API (master)
$ git checkout -b new-feature
Switched to a new branch 'new-feature'
```

6. Push the new branch to remote



7. View the Status of git

```
ABCD@LAPTOP-AVJC0KDS MINGW64 /e/sem-7/MAP/prac_1/API (new-feature)
$ git status
On branch new-feature
nothing to commit, working tree clean
```

8. git pull

```
ABCD@LAPTOP-AVJC0KDS MINGW64 /e/sem-7/MAP/prac_1/API (new-feature)
$ git push origin master
Everything up-to-date
```

9. git clone

Git clone clones the remote repository

- **Conclusion**: After performing this practical, I learn about basics of docker and git commands.