1. Create your own NGINX docker image(not using official image)
- Create a Dockerfile for NGINX image
- Edit file /usr/share/nginx/html/index.html and add a custom index.html through docker file
- Create a container from Nginx image and publish port 8080
- Exec bash on it and install nano
- Check on localhost:8080 changes
- Push image to docker hub in your docker registry, ECR, GCR

Solution:

1. Create an index.html file.
2. Create a default file for the NGINX server and specify it's path in the Dockerfile.
3. Create a Dockerfile for NGINX.
4. Build the image using the following command:
   docker build . -t q1-nginx:v2.0 -t q1-nginx:latest
5. Run the image using:
   docker run -itd -p 8080:80 --name=av-q1 q1-nginx
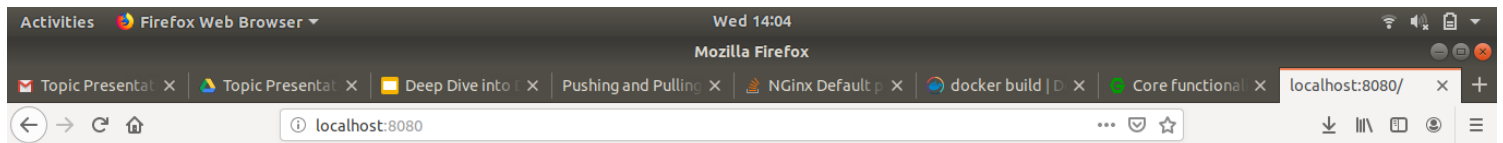
6. open your browser and type "localhost:8080" in your address bar. You'll see the following page:

```
File  Edit  View  Search  Terminal  Help
avinash@Quantiphi-929:~/Documents/containerization/asgn/q1$ docker image ls
REPOSITORY             TAG              IMAGE ID        CREATED           SIZE
q1-nginx               latest           dc775588efc7    19 minutes ago    151MB
q1-nginx               v2.0             dc775588efc7    19 minutes ago    151MB
q1-nginx               v1.0             76e41673b073    About an hour ago 64.2MB
flash-sample           v1               1ff1573f1a46    47 hours ago      417MB
flask-sample-one-av    latest           1ff1573f1a46    47 hours ago      417MB
nginx                  latest           e445ab08b2be    7 days ago        126MB
ubuntu                 16.04            5e13f8dd4c1a    7 days ago        120MB
ubuntu                 latest           3556258649b2    7 days ago        64.2MB
hello-world            latest           fce289e99eb9    7 months ago      1.84kB
avinash@Quantiphi-929:~/Documents/containerization/asgn/q1$ docker run -itd -p 8080:80 --name=av-q1 q1-nginx
ed0b12d8913146e54603355fd6ea91f5acc0756b3ace2a2d32fe3d115d5cec55
avinash@Quantiphi-929:~/Documents/containerization/asgn/q1$ docker ps
CONTAINER ID    IMAGE         COMMAND              CREATED          STATUS          PORTS                    NAMES
ed0b12d89131    q1-nginx      "nginx -g 'daemon of…"  5 seconds ago    Up 3 seconds    0.0.0.0:8080->80/tcp     av-q1
avinash@Quantiphi-929:~/Documents/containerization/asgn/q1$ []
```

7. exec bash and install nano:

```
File  Edit  View  Search  Terminal  Help
flask-sample-one-av    latest           1ff1573f1a46    47 hours ago      417MB
nginx                  latest           e445ab08b2be    7 days ago        126MB
ubuntu                 16.04            5e13f8dd4c1a    7 days ago        120MB
ubuntu                 latest           3556258649b2    7 days ago        64.2MB
hello-world            latest           fce289e99eb9    7 months ago      1.84kB
avinash@Quantiphi-929:~/Documents/containerization/asgn/q1$ docker run -itd -p 8080:80 --name=av-q1 q1-nginx
ed0b12d8913146e54603355fd6ea91f5acc0756b3ace2a2d32fe3d115d5cec55
avinash@Quantiphi-929:~/Documents/containerization/asgn/q1$ docker ps
CONTAINER ID    IMAGE         COMMAND              CREATED          STATUS          PORTS                    NAMES
ed0b12d89131    q1-nginx      "nginx -g 'daemon of…"  5 seconds ago    Up 3 seconds    0.0.0.0:8080->80/tcp     av-q1
avinash@Quantiphi-929:~/Documents/containerization/asgn/q1$ docker exec av-q1 bash
avinash@Quantiphi-929:~/Documents/containerization/asgn/q1$ docker exec -it av-q1 bash
root@ed0b12d89131:/# apt-get install nano
Reading package lists... Done
Building dependency tree
Reading state information... Done
Suggested packages:
  spell
The following NEW packages will be installed:
  nano
0 upgraded, 1 newly installed, 0 to remove and 0 not upgraded.
Need to get 231 kB of archives.
After this operation, 778 kB of additional disk space will be used.
Get:1 http://archive.ubuntu.com/ubuntu bionic/main amd64 nano amd64 2.9.3-2 [231 kB]
Fetched 231 kB in 0s (7323 kB/s)
debconf: delaying package configuration, since apt-utils is not installed
Selecting previously unselected package nano.
(Reading database ... 4857 files and directories currently installed.)
Preparing to unpack .../nano_2.9.3-2_amd64.deb ...
Unpacking nano (2.9.3-2) ...
Setting up nano (2.9.3-2) ...
update-alternatives: using /bin/nano to provide /usr/bin/editor (editor) in auto mode
update-alternatives: warning: skip creation of /usr/share/man/man1/editor.1.gz because associated file /usr/share/man/man1/nano.1.gz (of link group ed
itor) doesn't exist
update-alternatives: using /bin/nano to provide /usr/bin/pico (pico) in auto mode
update-alternatives: warning: skip creation of /usr/share/man/man1/pico.1.gz because associated file /usr/share/man/man1/nano.1.gz (of link group pico
) doesn't exist
root@ed0b12d89131:/# nano
root@ed0b12d89131:/# exit
exit
avinash@Quantiphi-929:~/Documents/containerization/asgn/q1$ []
```

8. Now, to push your image on docker hub:

```
avinash@Quantiphi-929:~/Documents/containerization/asgn/q1$ docker tag dc775588efc7 aavinashves/q1-nginx
avinash@Quantiphi-929:~/Documents/containerization/asgn/q1$ docker image ls
REPOSITORY              TAG           IMAGE ID        CREATED             SIZE
aavinashves/q1-nginx    latest        dc775588efc7    36 minutes ago      151MB
q1-nginx                latest        dc775588efc7    36 minutes ago      151MB
q1-nginx                v2.0          dc775588efc7    36 minutes ago      151MB
q1-nginx                v1.0          76e41673b073    About an hour ago   64.2MB
flash-sample            v1            1ff1573f1a46    47 hours ago        417MB
flask-sample-one-av     latest        1ff1573f1a46    47 hours ago        417MB
nginx                   latest        e445ab08b2be    7 days ago          126MB
ubuntu                  16.04         5e13f8dd4c1a    7 days ago          120MB
ubuntu                  latest        3556258649b2    7 days ago          64.2MB
hello-world             latest        fce289e99eb9    7 months ago        1.84kB
avinash@Quantiphi-929:~/Documents/containerization/asgn/q1$ docker push aavinashves/q1-nginx
The push refers to repository [docker.io/aavinashves/q1-nginx]
3e69970eb548: Mounted from aavinashves/q1-ngnix
6e5959229410: Mounted from aavinashves/q1-ngnix
e4f340cf6316: Mounted from aavinashves/q1-ngnix
b079b3fa8d1b: Mounted from aavinashves/q1-ngnix
a31dbd3063d7: Mounted from aavinashves/q1-ngnix
c56e09e1bd18: Mounted from aavinashves/q1-ngnix
543791078bdb: Mounted from aavinashves/q1-ngnix
latest: digest: sha256:3e1d5f8c27f51f5170d6edb00b62a1caef9425cf6723fb74e029cbdaa317bdf7 size: 1779
avinash@Quantiphi-929:~/Documents/containerization/asgn/q1$
```

9. GCR:

```
File  Edit  View  Search  Terminal  Help
avinash@Quantiphi-929:~/Documents/containerization/asgn/q1$ gcloud auth configure-docker
The following settings will be added to your Docker config file
located at [/home/avinash/.docker/config.json]:
 {
  "credHelpers": {
    "gcr.io": "gcloud",
    "us.gcr.io": "gcloud",
    "eu.gcr.io": "gcloud",
    "asia.gcr.io": "gcloud",
    "staging-k8s.gcr.io": "gcloud",
    "marketplace.gcr.io": "gcloud"
  }
}

Do you want to continue (Y/n)?  y

Docker configuration file updated.
avinash@Quantiphi-929:~/Documents/containerization/asgn/q1$ docker tag dc775588efc7 asia.gcr.io/pe-training/av-q1-nginx
avinash@Quantiphi-929:~/Documents/containerization/asgn/q1$ docker image ls
REPOSITORY                           TAG        IMAGE ID        CREATED             SIZE
asia.gcr.io/pe-training/av-q1-nginx  latest     dc775588efc7    45 minutes ago      151MB
aavinashves/q1-nginx                 latest     dc775588efc7    45 minutes ago      151MB
q1-nginx                             latest     dc775588efc7    45 minutes ago      151MB
q1-nginx                             v2.0       dc775588efc7    45 minutes ago      151MB
q1-nginx                             v1.0       76e41673b073    About an hour ago   64.2MB
flask-sample-one-av                  latest     1ff1573f1a46    2 days ago          417MB
flash-sample                         v1         1ff1573f1a46    2 days ago          417MB
nginx                                latest     e445ab08b2be    7 days ago          126MB
ubuntu                               16.04      5e13f8dd4c1a    7 days ago          120MB
ubuntu                               latest     3556258649b2    7 days ago          64.2MB
hello-world                          latest     fce289e99eb9    7 months ago        1.84kB
avinash@Quantiphi-929:~/Documents/containerization/asgn/q1$ docker push asia.gcr.io/pe-training/av-q1-nginx:latest
The push refers to repository [asia.gcr.io/pe-training/av-q1-nginx]
3e69970eb548: Pushed
6e5959229410: Pushed
e4f340cf6316: Pushed
b079b3fa8d1b: Layer already exists
a31dbd3063d7: Layer already exists
c56e09e1bd18: Layer already exists
543791078bdb: Layer already exists
latest: digest: sha256:3e1d5f8c27f51f5170d6edb00b62a1caef9425cf6723fb74e029cbdaa317bdf7 size: 1779
```

```
avinash@Quantiphi-929:~/Documents/containerization/asgn/q1$ gcloud container ima
ges list-tags asia.gcr.io/pe-training/av-q1-nginx
DIGEST          TAGS      TIMESTAMP
3e1d5f8c27f5    latest    2019-07-31T13:47:30
avinash@Quantiphi-929:~/Documents/containerization/asgn/q1$
```

10. ECR:
     1. create an ECR repo.

2. Run the following commands:

```
[root@ip-172-31-83-181 ec2-user]# docker tag dc775588efc7 488599217855.dkr.ecr.us-east-1.amazonaws.com/aavinash:latest
[root@ip-172-31-83-181 ec2-user]# docker push 488599217855.dkr.ecr.us-east-1.amazonaws.com/aavinash:latest
The push refers to repository [488599217855.dkr.ecr.us-east-1.amazonaws.com/aavinash]
3e69970eb548: Pushed
6e5959229410: Pushed
e4f340cf6316: Pushed
b079b3fa8d1b: Pushed
a31dbd3063d7: Pushed
c56e09e1bd18: Pushed
543791078bdb: Pushed
latest: digest: sha256:3e1d5f8c27f51f5170d6edb00b62a1caef9425cf6723fb74e029cbdaa317bdf7 size: 1779
[root@ip-172-31-83-181 ec2-user]#
```