Commands used to build Server and their Explanation

1) docker pull python:

   Explanation: This command is used to download python docker image from the internet.

2) docker run --name Assignment01_server1 --mount type=bind,source=C:\Users\nalin\Downloads\anmol_chabbra_40221995_A1\Server,target=/DS COMP6231 --shm-size 2GB -it python bash

   Explanation: This creates a container Assignment01_server1 from python image and runs the container in bash and mount it to local folder given in source path to target folder path and shm-size allocates 2 GB shared volume to container.

3) Inside Assignment01_server1 container bash commands

   a) apt-get update: It downloads and installs the updates for each outdated package and dependency on your system.

   b) apt-get install nano net-tools iputils-ping: To install ping, ifconfig and nano tools on container.

   c) ifconfig : To get network configuration information we copy inet address from here and and save it somewhere.

   d) cd DS_COMP6231: To change the current working directory to DS_COMP6231.

   e) ls -a: It list all files including hidden one as well.

   f) nano server.py Open server.py in terminal-based text editor and after opening we change HOST field to container inet address we got earlier.

   g) Ctrl + X : to come out of the server file.

   h) Save by pressing y and then press Enter

   j) python3 server.py : To run server python file.

   k) Ctrl + P and then Ctrl + Q: to come out of container to back to terminal.

4) docker commit Assignment01_server1 t1_clientserver_img

Explanation: This command is used to commit a container's file changes or settings into a new image so we are here committing Assignment01_server1 as t1_clientserver_img image.

Commands used to build client1 and their Explanation

1. docker run --name Assignment1_client1 --mount type=bind,source=C:\Users\nalin\Downloads\anmol_chabbra_40221995_A1\Client_01, target=/DS_COMP6231 --shm-size 2GB -it t1_clientserver_img /bin/bash

   Explanation: This command creates a container Assignment1_client1 out of t1_clientserver_img image and runs it in bash mode and mount it to local folder given in source path to target folder path and shm-size is used to allocate 2 GB shared volume to container.

2. Inside Assignment1_client1 container bash commands:
   a) ls -a: It list all files including hidden one as well.

   b) cd DS_COMP6231 : To change the current working directory to DS_COMP6231.

   c) nano client.py: This open client.py in terminal-based editor nano and then we change host field in here to container running server.py file inet/IP address.

   d) Ctrl + X: to exit from editor.

   e) Y : (Save by pressing y and then press Enter)

   f) python3 client.py: This is used to run client.py python file.

Commands used to build client2 and their Explanation

1. docker run --name Assignment1_client2 --mount type=bind,source=C:\Users\nalin\Downloads\anmol_chabbra_40221995_A1\Client_01, target=/DS_COMP6231 --shm-size 2GB -it t1_clientserver_img /bin/bash

   Explanation: This command creates a container Assignment1_client2 out of t1_clientserver_img image and runs it in bash mode and mount it to local folder given in source path to target folder path and shm-size is used to allocate 2 GB shared volume to container.

2. Inside Assignment1_client2 container bash commands:
   a) ls -a: It list all files including hidden one as well.

   b) cd DS_COMP6231 : To change the current working directory to DS_COMP6231.

   c) nano client.py: This open client.py in terminal-based editor nano and then we change host field in here to container running server.py file inet/IP address.

d) Ctrl + X: to exit from editor.

e) Y : (Save by pressing y and then press Enter)

f) python3 client.py: This is used to run client.py python file.

Commands used to build client3 and their Explanation

1. docker run --name Assignment1_client3 --mount type=bind,source=C:\Users\nalin\Downloads\anmol_chabbra_40221995_A1\Client_01, target=/DS_COMP6231 --shm-size 2GB -it t1_clientserver_img /bin/bash

Explanation: This command creates a container Assignment1_client2 out of t1_clientserver_img image and runs it in bash mode and mount it to local folder given in source path to target folder path and shm-size is used to allocate 2 GB shared volume to container.

2. Inside Assignment1_client2 container bash commands:
    a) ls -a: It list all files including hidden one as well.

    b) cd DS_COMP6231 : To change the current working directory to DS_COMP6231.

    c) nano client.py: This open client.py in terminal-based editor nano and then we change host field in here to container running server.py file inet/IP address.

    d) Ctrl + X: to exit from editor.

    e) Y : (Save by pressing y and then press Enter)

    f) python3 client.py: This is used to run client.py python file.

IP/Ports used in each container and the shared storage paths

1. IP address and ports used
    - Server: 172.17.0.2, Port: 654232

2. Shared Storage paths
    - Server: C:\Users\nalin\Downloads\anmol_chabbra_40221995_A1\Server

    - Client1: C:\Users\nalin\Downloads\anmol_chabbra_40221995_A1\Client_01

- Client2:
  C:\Users\nalin\Downloads\anmol_chabbra_40221995_A1\Client_02

- Client3:
  C:\Users\nalin\Downloads\anmol_chabbra_40221995_A1\Client_03