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CMPT 353

Assignment 1

Part A:

1. docker build
   - This command creates a new docker image relying on a dockerfile and a "context". The context is a set of files at a specified location, be that a file path or url.
   - The primary purpose of a dockerfile relating to docker build is to specify what image to use and what options to configure for the container. For example,
     - FROM node:latest <- this will use the latest image for NodeJS
       EXPOSE 8080 <- this will open port 8080 on the container
       WORKDIR /usr/src/app <- this will set the working directory for the container at startup
       CMD ["/bin/bash"] <- this will run a command when the container has been built
   - The –t option with docker build is to set a tag for the image, this is separate from the container's name, and is useful for reusing the same image when standing up multiple containers.
2. docker run
   - This command initializes a container from the specified image and then starts the container.
   - **-p** this option maps a port on the host system to a port on the container, ex: "-p 80:8080" would connect http://localhost:80 to 8080 on the container.
   - **-v** this option connects a local volume to the container, ex: "-v "/home/richard/Documents/CMPT 353/2025/Assignment 1":/usr/src/app" would map from my local folder Assignment 1 to app in the container.
   - **-it** will connect to an interactive terminal once the container has started
   - --name adds a name for the container, notably this is independent from the label, ex: "--name python1" and "--name python2" can be used to create two instances of the same container from an image.

Part B:

Contents of dockerfile:

```
FROM python:latest //B: 1.
EXPOSE 8080 //B: 3.
WORKDIR /usr/src/app //B: 2.
CMD ["/bin/bash"] //B: 4.
```

Command to build image: //B: 5.

docker build –t my/python .

Part C:

C: 1. my/python

C: 2. --name python1

C: 3. -p 80:8080

C: 4. –v "/home/richard/Documents/CMPT 353/2025/Assignment1/python":/usr/src/app

C: 5. -it

docker run -v "/home/richard/Documents/CMPT 353/2025/Assignment 1/python":/usr/src/app -p 80:8080 --name python1 -it my/python

Part D:

Contents of docker-compose.yml:

```yaml
services:
python-app:
image: my/python
build: .
container_name: python1
ports:
- 8080:8080
volumes:
- /home/richard/Documents/CMPT 353/2025/Assignment1/python:/usr/src/app
command: "/bin/bash"
stdin_open: true
tty: true
```

Command to start container:

docker compose up -d