**DOCKER**

Docker is a platform for developers and sysadmins to **build, run, and share** applications with containers. The use of containers to deploy applications is called containerization.

Containerization is increasingly popular because containers are:

* Flexible.
* Lightweight.
* Portable.
* Loosely coupled
* Scalable
* Secure

**Images and containers**

A container is nothing but a running process, with some added encapsulation features applied to it in order to keep it isolated from the host and from other containers. One of the most important aspects of container isolation is that each container interacts with its own private filesystem; this filesystem is provided by a Docker **image**. An image includes everything needed to run an application - the code or binary, runtimes, dependencies, and any other filesystem objects required.

**Download and install Docker Desktop**

<https://docs.docker.com/docker-for-windows/install/>

**Test Docker version**

 Run -> docker –version

**Create Docker image of Simple Python Application**

1. **Create a directory**
2. **Enter into Directory**
3. **Create Dockerfile**

It is require to create Docker image. It contains instructions that are read by Docker.

* **FROM** — set base image
* **RUN** — execute command in container
* **ENV** — set environment variable
* **WORKDIR** — set working directory
* **VOLUME** — create mount-point for a volume
* **CMD** — set executable for container

**// Dockerfile:** It cannot have any extension. Use VS Code.

FROM python

COPY . /src

CMD ["python", "/src/index.py"]

1. **Create a Python file**

Create a python file to execute in the Docker container.

**// index.py**

**print** ("Hello from python file");

1. **Create Docker Image**

To create Docker image of this python application, we need to use the following Docker command.

 docker build -t app .

1. **Check the available Docker images**

We can see all the available Docker images by the following command.

 docker images

1. **Run Docker**

After creating Docker image, now we can run it by using the following command.

docker run app

**Pushing and Pulling to and from Docker Hub**

**Getting an image to Docker Hub**

Imagine you made your own Docker image and would like to share it with the world you can sign up for an account on <https://hub.docker.com/>. After verifying your email, you are ready to go and upload your first docker image.

1. **Log in on**[**https://hub.docker.com/**](https://hub.docker.com/)
2. **Click on Create Repository.**
3. **Choose a name (e.g. SampleRepo) and a description for your repository and click Create.**
4. **Log into the Docker Hub from the command line**

docker login --username={yourhubusername}

Enter your password when prompted. If everything worked you will get a message similar to

Login Succeeded

1. **Check the image ID using**

docker images

and tag your image

docker tag {ImageID} {yourhubusername}/{RepositoryName}:{Tagname}

1. **Push your image to the repository you created**

docker push {yourhubusername}/{ RepositoryName }:{Tagname}

Your image is now available for everyone to use.

1. **Pull your image from the repository you created**

docker pull {yourhubusername}/{ RepositoryName }:{Tagname}

* **Deleting Docker Container**

Run the following command from your docker console to see a list of your containers:

docker ps -a

Run docker rm {containerid} to remove just that container.

* **Delete all the containers**

To delete all your containers, run:

$ docker ps -q -a | xargs docker rm

* -q prints only the container ID’s
* -a prints all containers
* passing all container IDs to xargs, docker rm deletes all containers
* **Deleting Docker Images**
* **Delete a Single Image**

1. Retrieve the Image ID using docker images (The Image IDs should be in the third column.)
2. Run docker rmi <image\_id>

For example:

$ docker rmi 60959f29de3a

**Continuoulsy Running a Container**

docker run -t -d {image name}

**Container Bash**

docker exec -it {container id} bash

**Docker RUN**

docker run -it(take user input) {images}