

## ASSIGNMENT 5 – DOCKER LAB 7

### MAIN TOPICS: Docker, Docker engine and CLI, REST API, image, Containerd, Docker network

Assignment Build a Docker image containing the REST server developed in a previous assignment. Steps:

- Write the Dockerfile of your image with all the required packages and your code;
- Build the image;
- Run the container and verify that it's working (Did you EXPOSE the correct port?).

Requirements:

- All the requirements of your Python app can be declared inside a requirements.txt file.
- You can create an account on Docker Hub, login and push your image [optional]

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(vai in VSC per app.py e il file di DOCKERFILE da spiegare per l'assignment 5)

IN MAC TERMINAL:

Check on the correct directory that contains the DockerFile (Desktop->esercizidistr)

BUILD THE IMAGE:

**docker build -t myserver .**

(-t stands for a tag and "." is for the context:

"Docker, look for the DockerFile and all the necessary files in the current directory)

**docker ps**

RUN THE DOCKER AND CHECK:

I specify to open only one port and to make the port mapping with the conventional: "port-on-host:port-on-container"

**docker run -d -p 8080:5001 --name my-running-app myserver**

(-d stands for detached, to run in background)

(otherwise I should have published all ports with -P or --publish-all in order to automatically configure the NAT of our machine) (in that case we make a container port available to everyone (Docker host address known in that case)

**docker ps**

To test it (just the deterministic as an example from the app.py file output)

```
curl -X POST http://localhost:5001/response/v1/resources \
-H "Content-Type: application/json" \
-d '{"distr": "deterministic", "params": {"fixed": 3}, "task": "cpu"}'
```

**docker logs my-running-app**

```
Host-011:esercizidistr mariapiabuonomo$ curl -X POST http://localhost:8080/response/v1/resources \
> -H "Content-Type: application/json" \
> -d '{"distr": "deterministic", "params": {"fixed": 3}, "task": "cpu"}'
{
  "distr": "deterministic",
  "id": "2510e7df-6006-4e0f-bdbf-142a18f8a646",
  "params": {
    "fixed": 3
  },
  "task": "cpu"
}
Host-011:esercizidistr mariapiabuonomo$ docker logs my-running-app
* Serving Flask app 'app'
* Debug mode: on
WARNING: This is a development server. Do not use it in a production deployment. Use a production WSGI
server instead.
* Running on all addresses (0.0.0.0)
* Running on http://127.0.0.1:5001
* Running on http://172.17.0.2:5001
Press CTRL+C to quit
* Restarting with stat
* Debugger is active!
* Debugger PIN: 258-153-472
192.168.65.1 - - [25/Jan/2026 08:23:24] "POST /response/v1/resources HTTP/1.1" 201 -
192.168.65.1 - - [25/Jan/2026 08:24:18] "POST /response/v1/resources HTTP/1.1" 201 -
192.168.65.1 - - [25/Jan/2026 08:24:54] "POST /response/v1/resources HTTP/1.1" 201 -
192.168.65.1 - - [25/Jan/2026 08:28:09] "POST /response/v1/resources HTTP/1.1" 201 -
Host-011:esercizidistr mariapiabuonomo$
```

Optional part:

**docker ps**

**docker stop <ID>** (of the previous one)

**docker rm <ID>**

**docker build -t myrestserver .** (I build another image)

**docker tag myrestserver simplicementeria/myrestserver:v1** (It's a sort of alias in order to refer to my local image, by including the user name of the register (mine of Docker Hub))

“my restserver:v1” is necessary for Docker Hub to know exactly where to push the image on the cloud. Otherwise the push image would fail.

**docker push simplicementeria/myrestserver:v1** (upload of the image on the remote register, so the application can be used by everyone online even without the source code)

**docker run -p 8080:5001 simplicementeria/myrestserver:v1** (it creates and run the new container basing on the uploaded image)

If I test it with curl as before in another terminal I can see that the remote server is correctly working!

```
source /Users/mariapiabuonomo/Desktop/esercizidistr/
mariapiabuonomo@MacBookAir: ~/esercizidistr % source /U
(.venv) mariapiabuonomo@MacBookAir: ~/esercizidistr % /
izidistr/app.py
* Serving Flask app 'app'
* Debug mode: on
WARNING: This is a development server. Do not use it
* Running on all addresses (0.0.0.0)
* Running on http://127.0.0.1:5001
* Running on http://192.168.1.44:5001
Press CTRL+C to quit
* Restarting with stat
* Debugger is active!
* Debugger PIN: 928-619-948
127.0.0.1 - - [26/Jan/2026 15:43:49] "GET /response/v1/resources HTTP/1.1" 200 -
127.0.0.1 - - [26/Jan/2026 15:43:53] "PUT /response/v1/resources/ee646ff0-f5b0-412b-9730-381fb4834e16 HTTP/1.1" 404 -
127.0.0.1 - - [26/Jan/2026 15:44:24] "PUT /response/v1/resources/49203a6b-c99a-4264-a972-3588d3ed6661 HTTP/1.1" 404 -
127.0.0.1 - - [26/Jan/2026 15:45:37] "POST /response/v1/resources HTTP/1.1" 201 -

MacBookAir:esercizidistr mariapiabuonomo$ curl -X POST http://localhost:5001/response/v1/resources
-H "Content-Type: application/json" \
-d '{"distr": "deterministic", "params": {"fixed": 3}, "task": "cpu"}'
{"distr": "deterministic",
"id": "09a683a7-2664-404a-afa9-6130f47efcb4",
"params": {
"fixed": 3
},
"task": "cpu"
}
MacBookAir:esercizidistr mariapiabuonomo$
```

(PS the resource not found was because of the post on the wrong port!)

Test on the PUT:

**curl -X PUT http://localhost:5001/response/v1/resources/0a531d5b-ec9d-4aae-a9fd-6587b5af2679 \**

**-H "Content-Type: application/json" \**

**-d '{"distr": "deterministic", "params": {"fixed": 1}, "task": "cpu"}'**

(by changing the cpu number)

```
(.venv) mariapiabuonomo@MacBookAir: ~/esercizidistr % /
izidistr/app.py
WARNING: This is a development server. Do not use it
* Running on all addresses (0.0.0.0)
* Running on http://127.0.0.1:5001
* Running on http://192.168.1.44:5001
Press CTRL+C to quit
* Restarting with stat
* Debugger is active!
* Debugger PIN: 928-619-948
127.0.0.1 - - [26/Jan/2026 15:43:49] "GET /response/
127.0.0.1 - - [26/Jan/2026 15:43:53] "PUT /response/
127.0.0.1 - - [26/Jan/2026 15:44:24] "PUT /response/v1/resources/49203a6b-c99a-4264-a972-3588d3ed6661 HTTP/1.1" 404 -
127.0.0.1 - - [26/Jan/2026 15:45:37] "POST /response/v1/resources HTTP/1.1" 201 -
127.0.0.1 - - [26/Jan/2026 15:47:46] "PUT /response/v1/resources/09a683a7-2664-404a-afa9-6130f47efcb4 HTTP/1.1" 404 -
127.0.0.1 - - [26/Jan/2026 15:48:33] "POST /response/v1/resources HTTP/1.1" 201 -
127.0.0.1 - - [26/Jan/2026 15:48:43] "GET /response/v1/resources HTTP/1.1" 200 -
127.0.0.1 - - [26/Jan/2026 15:49:24] "PUT /response/v1/resources/0a531d5b-ec9d-4aae-a9fd-6587b5af2679 HTTP/1.1" 200 -

MacBookAir:esercizidistr mariapiabuonomo$ curl -X PUT http://localhost:5001/response/v1/resources/0
31d5b-ec9d-4aae-a9fd-6587b5af2679 \
-H "Content-Type: application/json" \
-d '{"distr": "deterministic", "params": {"fixed": 1}, "task": "cpu"}'
{"distr": "deterministic",
"id": "0a531d5b-ec9d-4aae-a9fd-6587b5af2679",
"params": {
"fixed": 1
},
"task": "cpu"
}
MacBookAir:esercizidistr mariapiabuonomo$
```