

# Exercise report

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## Program explanation:

The python script is a simple web application using the Flask framework. It creates a basic web server that listens on port 8080 and responds with “Hello World”.

- **Dockerize the python app:**

Because I didn't use before docker I had to install the docker from the official website (windows version). Then I created a docker file in the same directory as my 'hello\_world.py' script. This file is containing instructions for building the docker image.

```
# Use an official Python runtime as a parent image
FROM python:3.8-slim

# Set the working directory in the container
WORKDIR /app

# Copy the current directory contents into the container at /app
COPY . /app

# Make port 8080 available to the world outside this container
EXPOSE 8080

RUN pip install flask

# Define environment variable
ENV NAME World

# Run the command to start your application
CMD ["python", "hello_world.py"]
```

After writing the above in the Dockerfile I typed in the PyCharm terminal the 2 following commands in order to build the docker image and run the docker container.

```
docker build -t hello_world-app .
```

```
docker run -p 8080:8080 hello_world-app
```

To then test the application, I opened a web browser and navigated to localhost:8080 within the docker container.

- **Publish docker image to docker hub:**

Firstly, I typed docker login in order to login in my docker account. Then I typed

```
docker tag helloworld hellsbells998/TRG:latest
```

in order to tag the docker image in the desired repository name

After tagging the docker image I typed:

```
docker push hellsbells998/trg
```

In order to push the docker image to docker hub.

For other users to pull my work it is possible using **docker pull** command.

- **Create a docker compose file that will contain the image you build and an nginx proxy**

Firstly, we need to create a docker-compose.yml file in the same directory with the script.

```

version: '3'
services:
  nginx-proxy:
    image: nginx:latest
    ports:
      - "80:80"
    links:
      - hello-world-app
    volumes:
      - ./nginx-config/nginx.conf:/etc/nginx/conf.d/default.conf

  hello-world-app:
    build:
      context: .
      dockerfile: Dockerfile
    expose:
      - "8080"

```

Here we define 2 services. The volume's part will be explained later.

The nginx-proxy service used the official nginx image and exposes port 80 for public access.

The hello-world-app build the docker image from the Dockerfile and exposes port 8080 but it is not publicly accessible.

By default, the Nginx container is publicly accessible on port 80, and it can proxy requests to the Flash application. In order to configure Nginx, we need a config file. First, we need to create a directory nginx-config and place nginx configuration file.

```

server {
    listen 80;
    server_name localhost;

    location / {
        proxy_pass http://hello-world-app:8080;
        proxy_set_header Host $host;
        proxy_set_header X-Real-IP $remote_addr;
    }
}

```

Conf file that forwards requests to the Flask application.

So, in the docker-compose.yml we add a volume definition for the config file.

Then in order to start the docker compose configuration we need to run the following command:

**docker-compose up**

Now, Nginx will proxy requests to my Flask application, making it publicly accessible while keeping the Flask app itself not.