# Name: Lingzi Jin

Note, in this homework, we will use FASTAPI web framework. (https://fastapi.tiangolo.com/)

## Step 1: design two docker apps. One is for city to zipcode, another one is zipcode to weather.

Create python venv, and install FASTAPI and uvicorn

python3 -m venv venv

pip3 install fastapi

pip3 install uvicorn



Graphical user interface, text, application, chat or text message

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## Step 2: create code for the two apps using hard coded logic, commit change to git:

### 2.1 city to zip code: (host in 8000)

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### 2.2 zip code to weather: (host in 8001)

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## Step3: containerize the two web services:

### 3.1 city to zip code: (host in 8000)

Collect the dependency of our python program: pip3 freeze > dependency.txt

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### Create docker file and create a work dir name is /city-to-zip-app, copy the dependency file into it and run pip install to install all dependency. Copy the app dir into the container /app folder, run python ./app/main.py at the end:

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Compile docker container and run it at port 8000

docker build -t docker1-city-to-zip .

docker run -p 8000:8000 docker1-city-to-zip

lingzijin@Lingzis-MacBook-Pro docker1\_city\_to\_zip % docker run -p 8000:8000 docker1-city-to-zip

INFO: Started server process [1]

INFO: Waiting for application startup.

INFO: Application startup complete.

INFO: Uvicorn running on http://0.0.0.0:8000 (Press CTRL+C to quit)

Test at localhost:

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Graphical user interface, text, application

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### Graphical user interface, text, application Description automatically generated

### Server log:

### Text Description automatically generated

### 3.2 zip code to weather: (host in 8001)

Details are very similar to 3.1. we will only screen shot test result:

Graphical user interface, text, application

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Graphical user interface, text, application

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Graphical user interface, text, application

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Server log:

Text

Description automatically generated

## Step4: make two container work together. (optional)

The idea here is simple, host container2 first in 8001, then host container1. Hard code container2’s endpoint into container1. Such as:

url = f"http://10.0.0.46:8001/ziptoweather/{zipcode}"

Note that, I try to use localhost:8080 to represent container2, but I get an error:

MaxRetryError: HTTPConnectionPool(host='localhost', port=8001): Max retries exceeded with url: /ziptoweather/94085 (Caused by NewConnectionError('<urllib3.connection.HTTPConnection object at 0xffff9e735520>: Failed to establish a new connection: [Errno 111] Connection refused'))

**Turns out I need to use my IP address instead of localhost.**

Test Result:

Query city and get weather:

Graphical user interface, text, application

Description automatically generated

Server 1 Log:

Text

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Server2 log:

Text

Description automatically generated