Containerize the App

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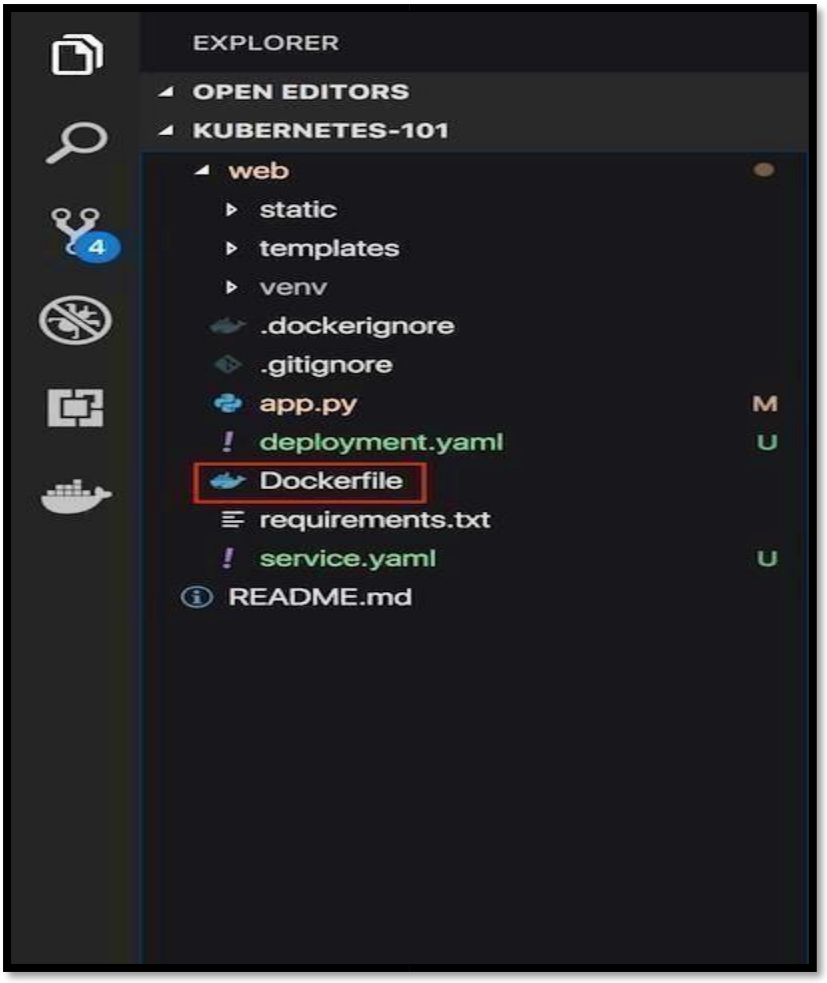
Project Name	Skills/Job Recommender Application

Containerize your Flask application

- In your project directory, create a file named "Docker file." *Suggestion: Name your fileexactly "Docker file," nothing else.*



A "Docker file" is used to indicate to Docker a base image, the Docker settings you need, and a list ofcommands you would like to have executed to prepare and start your new container.

- In the file, paste this code:

```
FROM python:2.7
LABEL maintainer="Kunal Malhotra, kunal.malhotra1@ibm.com"
```

```
.    RUN apt-get update
..   RUN mkdir /app
..   WORKDIR /app
..   COPY . /app
.    RUN pip install -r requirements.txt
     EXPOSE 5000
     ENTRYPOINT [ "python" ]
     CMD["app.py" ]
```

Explanation and breakdown of the above Dockerfile code

1. The first part of the code above is:

```
FROM python:2.7
```

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Because this Flask application uses Python 2.7, we want an environment that supports it and already has it installed. Fortunately, DockerHub has an official image that's installed on top of Ubuntu. In one line, we will have a base Ubuntu image with Python 2.7, virtualenv, and pip. There are tons of images on DockerHub, but if you would like to start off with a fresh Ubuntu image and build on top of it, you could do that.

3. Let's look at the next part of the code:

```
4.  LABEL maintainer="Kunal Malhotra, kunal.malhotra1@ibm.com"
5.  RUN apt-get update
```

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6. Note the maintainer and update the Ubuntu package index. The command is `RUN`, which is a function that runs the command after it.

```
7.  RUN mkdir /app
8.  WORKDIR /app
9.  COPY . /app
```

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10. Now it's time to add the Flask application to the image. For simplicity, copy the application under the `/app` directory on our Docker Image.

`WORKDIR` is essentially a **cd** in bash, and `COPY` copies a certain directory to the provided directory in an image. `ADD` is another command that does the same thing as `COPY`, but it also allows you to add a repository from a URL. Thus, if you want to clone your git repository instead of copying it from your local repository (for staging and production purposes), you can use that. `COPY`, however, should be used most of the time unless you have a URL.

11. Now that we have our repository copied to the image, we will install all of our dependencies, which

```
RUN pip install --no-cache-dir -r requirements.txt
```

is defined in the `requirements.txt` part of the code.

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13. We want `EXPOSE 5000` to expose the port(5000) the Flask application runs on, so we use `EXPOSE`.

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15. `ENTRYPOINT` specifies the entrypoint of your application.
16. `ENTRYPOINT [ "python" ]`
17. `CMD [ "app.py" ]`

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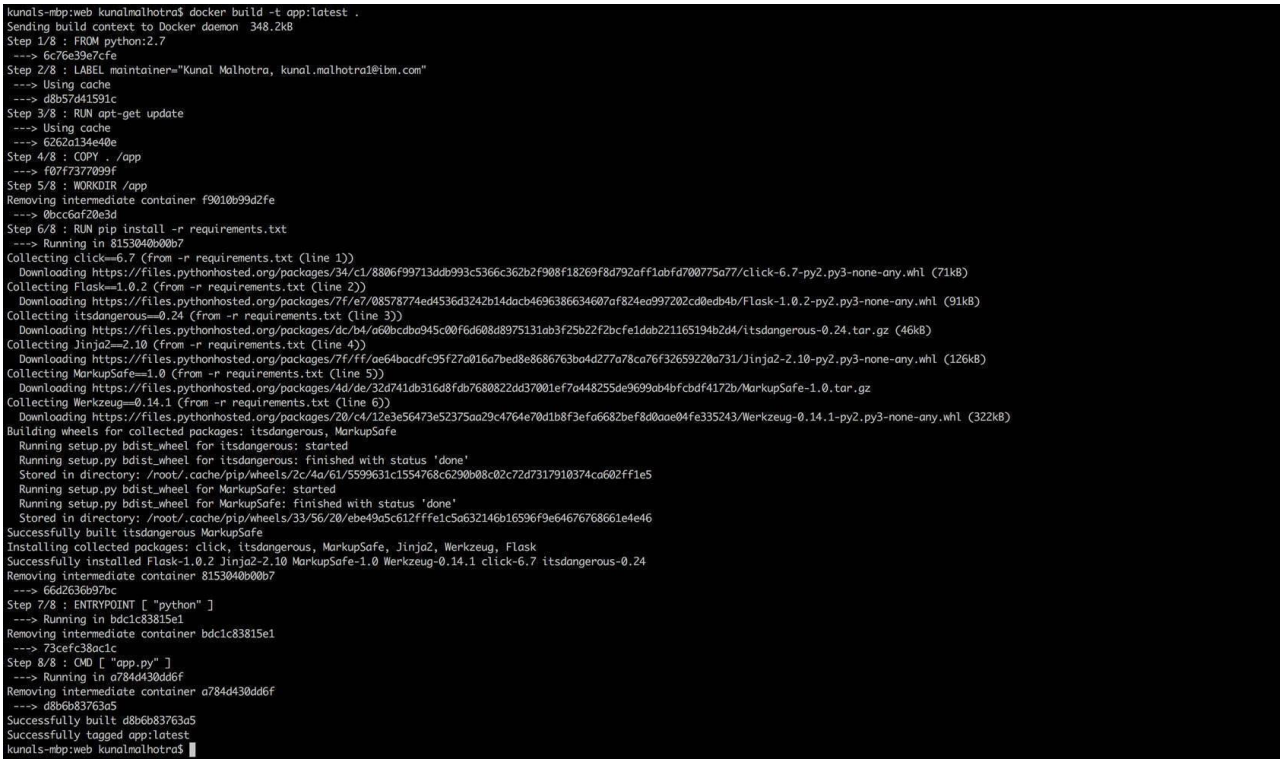
Build an image from the Dockerfile

Open the terminal and type this command to build an image from your Dockerfile: `docker build -t <image_name>:<tag> .` (note the period to indicate we're in our apps top level directory). For example: `docker build -t app:latest .`



Run your container locally and test

After you build your image successfully, type: `docker run -d -p 5000:5000 app`

This command will create a container that contains all the application code and dependencies from the image and runs it locally.

```
kunals-mbp:web kunalmalhotra$ docker run -d -p 5000:5000 app
3c2bbf86f758e9a606006eb52a2ef389ea8400eb88263137ca5543c60c616247
kunals-mbp:web kunalmalhotra$ docker ps
CONTAINER ID        IMAGE               COMMAND             CREATED             STATUS              PORTS                    NAMES
3c2bbf86f758        app                 "python app.py"     Less than a second ago   Up 5 seconds        0.0.0.0:5000->5000/tcp   compassionate_keldysh
kunals-mbp:web kunalmalhotra$
```