CONTAINERIZE THE APP

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Project Name	Skill / Job Recommender Application
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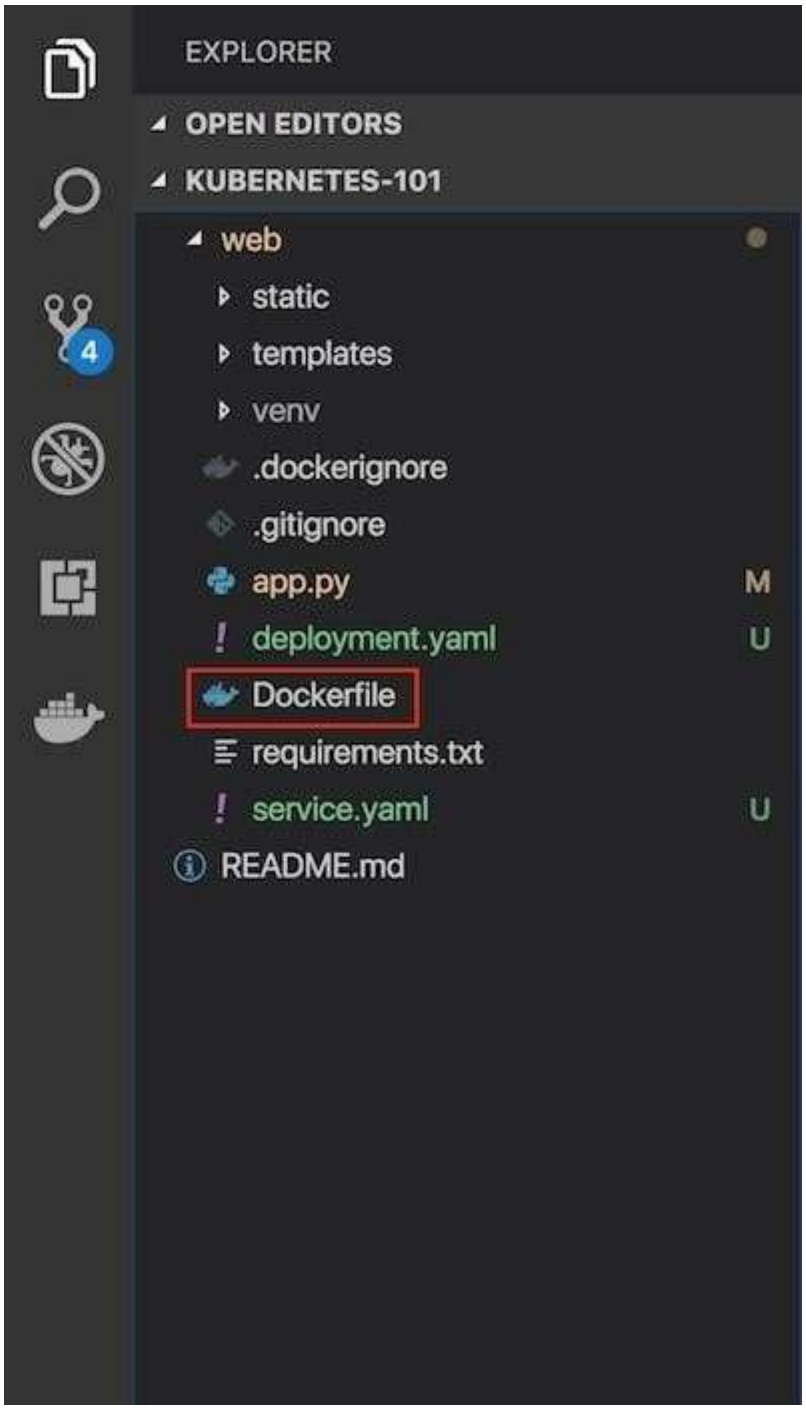
Containerize your Flask application

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



A "Dockerfile" is used to indicate to Docker a base image, the Docker settings you need, and a list of commands 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="jefrin,jefrin@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"]

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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="jefrin-jefrin@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,

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

which 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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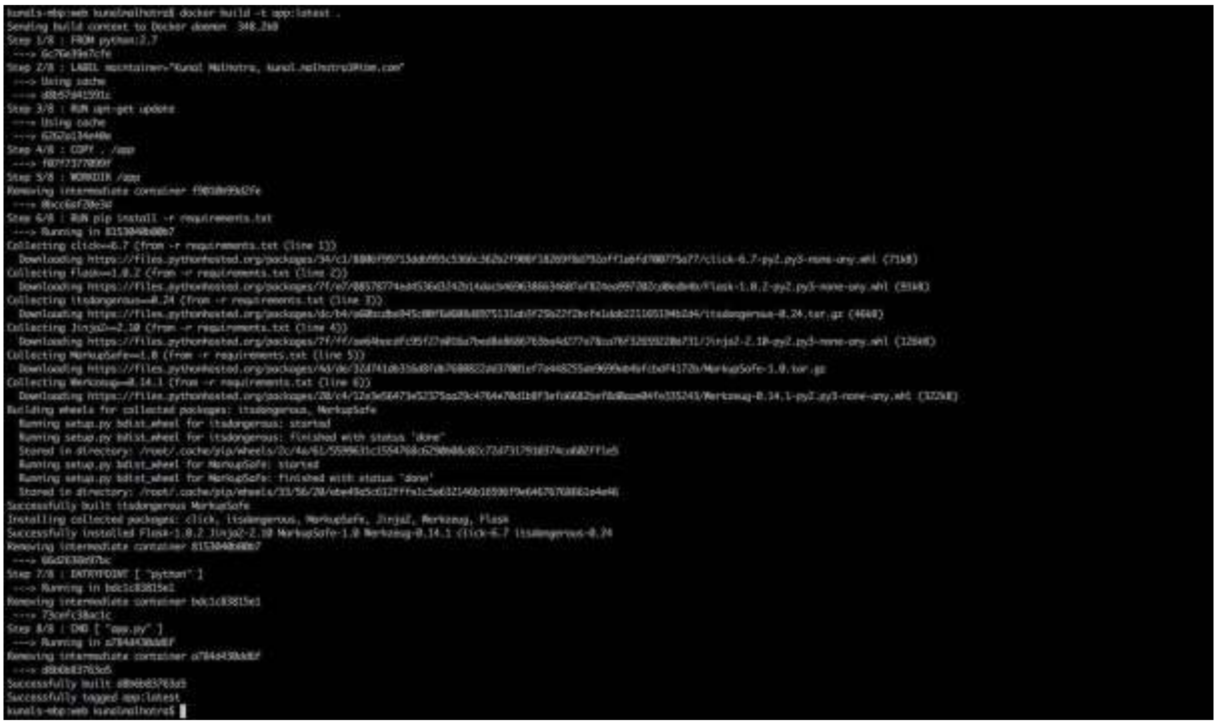
Build an image from the Dockerfile

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 .

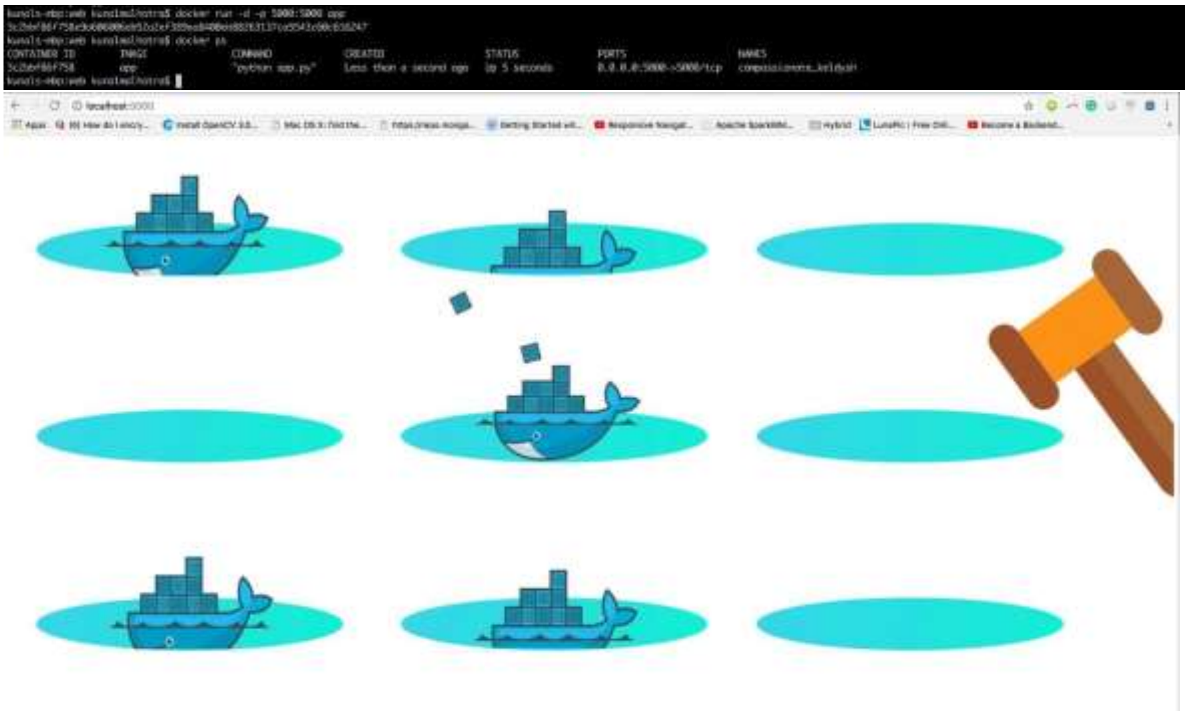


```
kunals-mbp:web kunalmalhotra$ docker build -t app:latest .
Sending build context to Docker daemon  348.2kB
Step 1/8 : FROM python:2.7
 ---> [illegible]
Step 2/8 : LABEL maintainer="Kunal Malhotra, kunal.malhotra1@ibm.com"
 ---> Using cache
 ---> [illegible]
Step 3/8 : RUN apt-get update
 ---> Using cache
 ---> [illegible]
Step 4/8 : COPY . /app
 ---> [illegible]
Step 5/8 : WORKDIR /app
Removing intermediate container [illegible]
 ---> [illegible]
Step 6/8 : RUN pip install -r requirements.txt
 ---> Running in [illegible]
Collecting click==6.7 (from -r requirements.txt (line 1))
  Downloading https://files.pythonhosted.org/packages/34/c1/[illegible]/click-6.7-py2.py3-none-any.whl (71kB)
Collecting Flask==1.0.2 (from -r requirements.txt (line 2))
  Downloading https://files.pythonhosted.org/packages/7f/e7/[illegible]/Flask-1.0.2-py2.py3-none-any.whl (91kB)
Collecting itsdangerous==0.24 (from -r requirements.txt (line 3))
  Downloading https://files.pythonhosted.org/packages/dc/b4/[illegible]/itsdangerous-0.24.tar.gz (46kB)
Collecting Jinja2==2.10 (from -r requirements.txt (line 4))
  Downloading https://files.pythonhosted.org/packages/7f/ff/[illegible]/Jinja2-2.10-py2.py3-none-any.whl (126kB)
Collecting MarkupSafe==1.0 (from -r requirements.txt (line 5))
  Downloading https://files.pythonhosted.org/packages/4d/de/[illegible]/MarkupSafe-1.0.tar.gz
Collecting Werkzeug==0.14.1 (from -r requirements.txt (line 6))
  Downloading https://files.pythonhosted.org/packages/20/c4/[illegible]/Werkzeug-0.14.1-py2.py3-none-any.whl (322kB)
Building wheels for collected packages: itsdangerous, MarkupSafe
  Running setup.py bdist_wheel for itsdangerous: started
  Running setup.py bdist_wheel for itsdangerous: finished with status 'done'
  Stored in directory: /root/.cache/pip/wheels/2c/4a/61/[illegible]
  Running setup.py bdist_wheel for MarkupSafe: started
  Running setup.py bdist_wheel for MarkupSafe: finished with status 'done'
  Stored in directory: /root/.cache/pip/wheels/33/56/20/[illegible]
Successfully built itsdangerous MarkupSafe
Installing collected packages: click, itsdangerous, MarkupSafe, Jinja2, Werkzeug, Flask
Successfully installed Flask-1.0.2 Jinja2-2.10 MarkupSafe-1.0 Werkzeug-0.14.1 click-6.7 itsdangerous-0.24
Removing intermediate container [illegible]
 ---> [illegible]
Step 7/8 : ENTRYPOINT [ "python" ]
 ---> Running in [illegible]
Removing intermediate container [illegible]
 ---> [illegible]
Step 8/8 : CMD [ "app.py" ]
 ---> Running in [illegible]
Removing intermediate container [illegible]
 ---> [illegible]
Successfully built [illegible]
Successfully tagged app:latest
kunals-mbp:web kunalmalhotra$
```

Run your container locally and test

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

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



```
kunals-mbp:web kunalmal/notra$ docker run -d -p 5000:5000 app
3c2bbf86f758[illegible]
kunals-mbp:web kunalmal/notra$ 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   [illegible]
kunals-mbp:web kunalmal/notra$
```