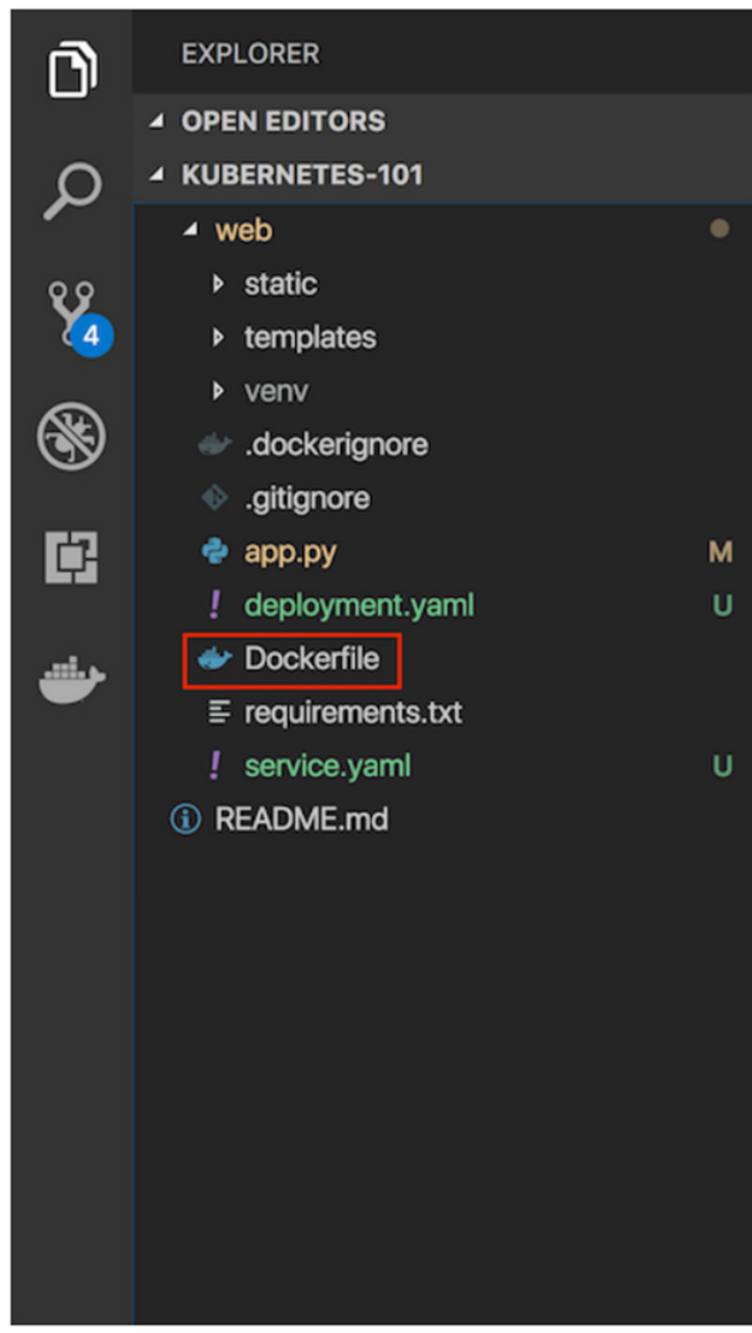


DEPLOYMENT OF APP IN IBM CLOUD

CONTAINERIZE YOUR FLASK APPLICATION



A "Docker file" 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="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 Docker file code

1.The first part of the code above is:

```
FROM python:2.7
```

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.

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

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

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

```
RUN mkdir /app  
WORKDIR /app  
COPY . /app
```

4. 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.

5. Now that we have our repository copied to the image, we will install all of our dependencies, which is defined in the requirements.txt part of the code.

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

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

```
EXPOSE 5000
```

7. ENTRYPOINT specifies the entry point of your application.

```
ENTRYPOINT [ "python" ]  
CMD [ "app.py" ]
```

Build an image from the Docker file

Open the terminal and type this command to build an image from your Docker file: `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` .

```
kunal@mbp:~$ docker build -t app:latest .
Sending build context to Docker daemon 348.2kB
Step 1/8 : FROM python:2.7
--> 6c76e39a7cfe
Step 2/8 : LABEL maintainer="Kunal Malhotra, kunal.malhotra@fhn.com"
--> Using cache
--> db57d41d31c
Step 3/8 : RUN apt-get update
--> Using cache
--> 6262d134e48e
Step 4/8 : COPY . /app
--> f0d77372709
Step 5/8 : WORKDIR /app
Removing intermediate container f9018e99a2fe
--> 0bccc6f2b3d
Step 6/8 : RUN pip install -r requirements.txt
--> Running in 8352400007
Collecting click==6.7 (from -r requirements.txt (line 3))
  Downloading https://files.pythonhosted.org/packages/34/c1/8886f997136d993c536c362b7f988f18269f8d730af11abf4700775a77/click-6.7-py3-none-any.whl (71kB)
Collecting Flask==1.0.2 (from -r requirements.txt (line 2))
  Downloading https://files.pythonhosted.org/packages/7f/47/80578774ed4536d342b14dcb46963863460af824ea997202cd0eb4b/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/b4/608cd89f5c00f6d008d8375131ab3f25b22f2b3ef1d0b22115519b2d4/itsdangerous-0.24.tar.gz (40kB)
Collecting Jinja2==2.10 (from -r requirements.txt (line 4))
  Downloading https://files.pythonhosted.org/packages/7f/4f/0e4b0dcf39f27a026a7ed8e8867639e4d277a78ca76f32659220a7312/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/50241dd3160f4b7688226d57021ef7944525d69693ab4bfcd4f4172b/MarkupSafe-1.0.tar.gz
Collecting Werkzeug==0.14.1 (from -r requirements.txt (line 6))
  Downloading https://files.pythonhosted.org/packages/20/c4/12e3e56473e52375a09c4764e701b63f06682bef8d0a0e4fe335243/Werkzeug-0.14.1-py2.py3-none-any.whl (32kB)
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/61/5599031c1554768c620b088d82c72d7317918374cd02ff1e5
  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/25/26/20/ee9e9d0c1c1f1f181c083240b1099f706467b7081e4e4e
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 8153040b007
--> 46d2369279c
Step 7/8 : ENTRYPOINT [ "python" ]
--> Running in bd1c83815e1
Removing intermediate container bd1c83815e1
--> 72cef380c1c
Step 8/8 : CMD [ "app.py" ]
--> Running in a7846430a8f
Removing intermediate container a7846430a8f
--> d886d83763e5
Successfully built d886d83763e5
Successfully tagged app:latest
kunal@mbp:~$
```

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.

```
kunal@mbp:~$ docker run -d -p 5000:5000 app
3c2ba7867758
kunal@mbp:~$ docker ps
CONTAINER ID        IMAGE               COMMAND             CREATED             STATUS              PORTS              NAMES
3c2ba7867758        app                 "python app.py"     Less than a second ago    Up 5 seconds        0.0.0.0:5000->5000/tcp    compassionate_heldysh
kunal@mbp:~$
```

