Create Django Proxy Services Of Backend APIs

Skills Network

Estimated time needed: 120 minutes

In previous labs, you created car models and car-made Django models residing in a local SQLite repository. You are also provided with dealer and review models Mongo DB served by express API end points.

Now, you need to integrate those models and services to manage all entities such as dealers and reviews.

To integrate external dealer and review data, you need to call the API end points from the Django app and process the API results in Django views. Such Django views can be seen as proxy services to the end user because they fetch data from external resources per users' requests.

In this lab, you will create such Django views as proxy services.

Run the Mongo Server

The backend Mongo Express server needs to be up and running in one of the terminals in the lab environment. At this stage, the server code will have all the end points implemented already.

1. Open a new Terminal.
2. Git clone your repository with all the changes you have made in the previous tasks.
3. Change to the database directory.

```
cd /home/project/xrwvm-fullstack_developer_capstone/server/database
```

Copied! Executed!

4. Build the nodeapp.

```
docker build . -t nodeapp
```

Copied! Executed!

5. Run the following command to start the server.

```
docker-compose up
```

Copied! Executed!

6. Keep the server running in this terminal. You will need it for doing the rest of the lab.
7. Click the `Backend` button below, copy the URL in the address bar.

Backend

   Note: If the button doesn't work, launch the application on Port `3030` to obtain the URL.

8. Open `djangoapp/.env` and replace the `your backend url` with the URL of your backend you copied earlier in the notepad in the previous step.

   Make sure that the `/` at the end is not copied.

```
backend_url =your backend url
```

Copied!

Please refer to the lab if required.

Environment setup

1. Open another new terminal.
2. Run the following to set up the django environment.

```
cd /home/project/xrwvm-fullstack_developer_capstone/server

pip install virtualenv
virtualenv djangoenv
source djangoenv/bin/activate
```

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3. Install the required packages by running the following command.

```
python3 -m pip install -U -r requirements.txt
```

Copied! Executed!

4. Run the following command to perform models migration.

```
python3 manage.py makemigrations
python3 manage.py migrate
python3 manage.py runserver
```

Copied! Executed!

Create function to interact with backend

In the previous lab, you would have created a API endpoints to fetchReviews and fetchDealers. Now implement a method to access these from the Django app.

There are many ways to make HTTP requests in Django. Here we use a very popular and easy-to-use Python library called `requests`.

1. Open `djangoapp/restapis.py` and add a `get_request` method, as given below.

```

def get_request(endpoint, **kwargs):
    params = ""
    if(kwargs):
        for key,value in kwargs.items():
            params=params+key+"="+value+"&"

    request_url = backend_url+endpoint+"?"+params

    print("GET from {} ".format(request_url))
    try:
        # Call get method of requests library with URL and parameters
        response = requests.get(request_url)
        return response.json()
    except:
        # If any error occurs
        print("Network exception occurred")
```

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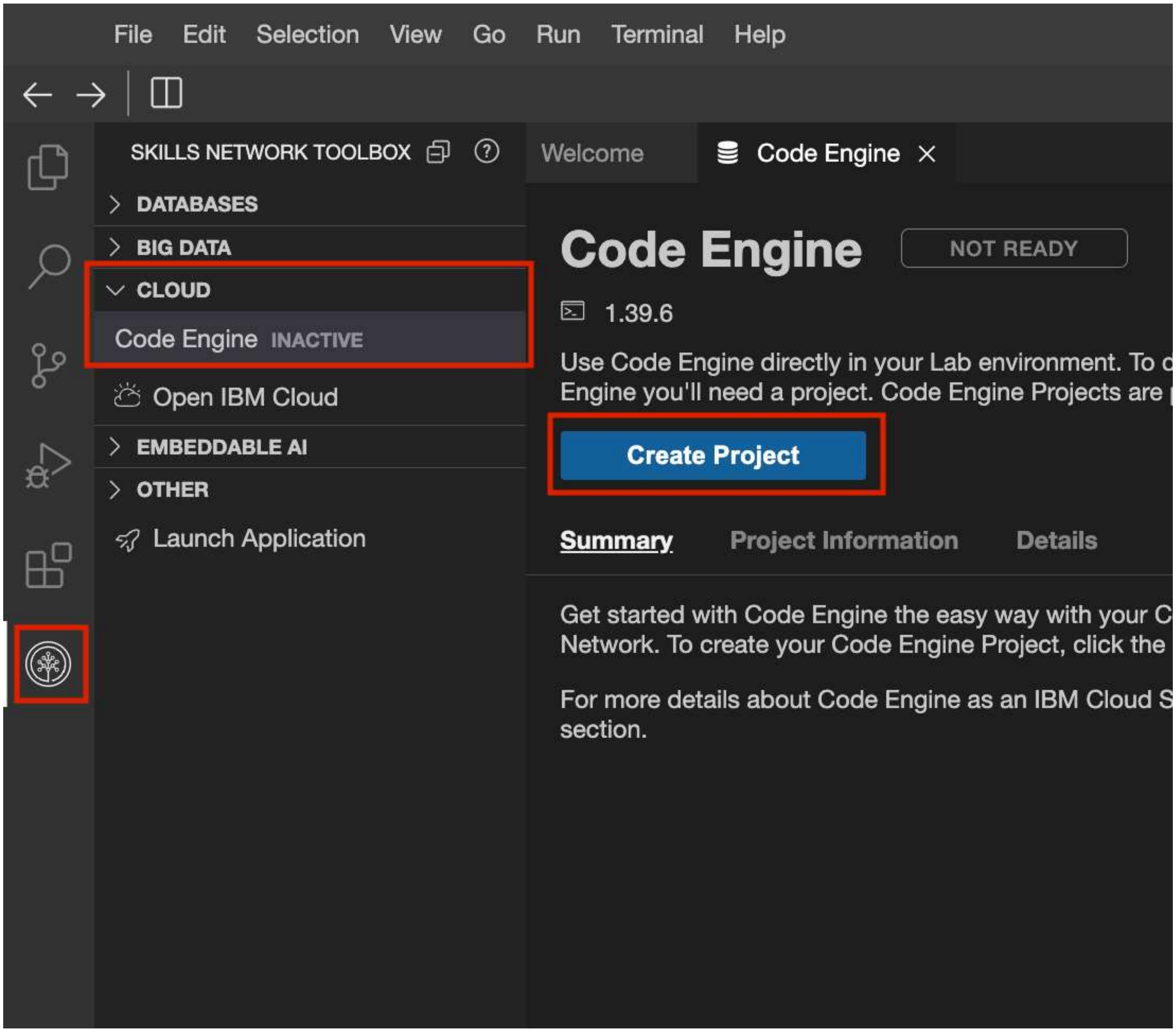
The `get_request` method has two arguments, the endpoint to be requested, and a Python keyword arguments representing all URL parameters to be associated with the get call.

This function calls `GET` method in `requests` library with a URL and any URL parameters such as `dealerId`.

Start the Code Engine

1. Start code engine by creating a project.



Code Engine

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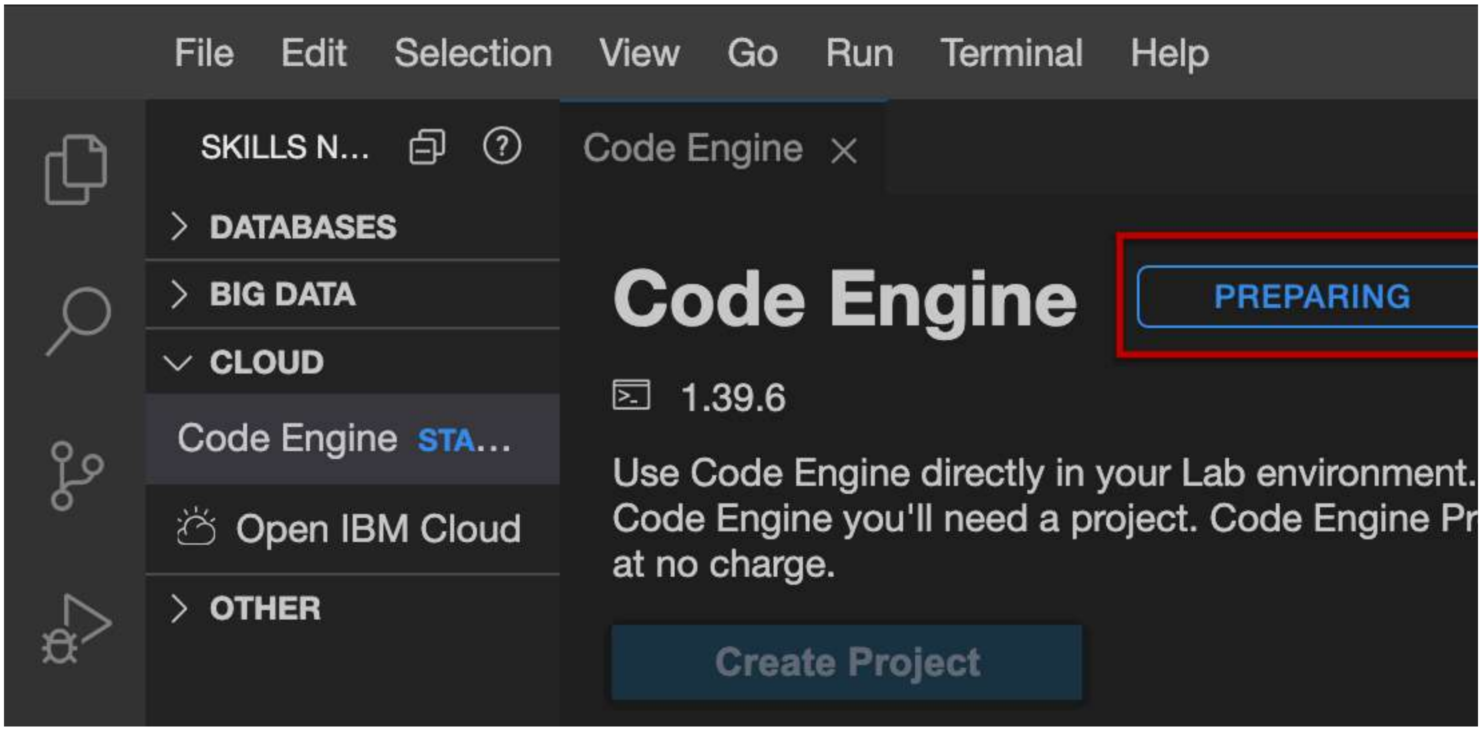
Engine you'll need a project. Code Engine Projects are

Get started with Code Engine the easy way with your C
Network. To create your Code Engine Project, click the

For more details about Code Engine as an IBM Cloud S
section.

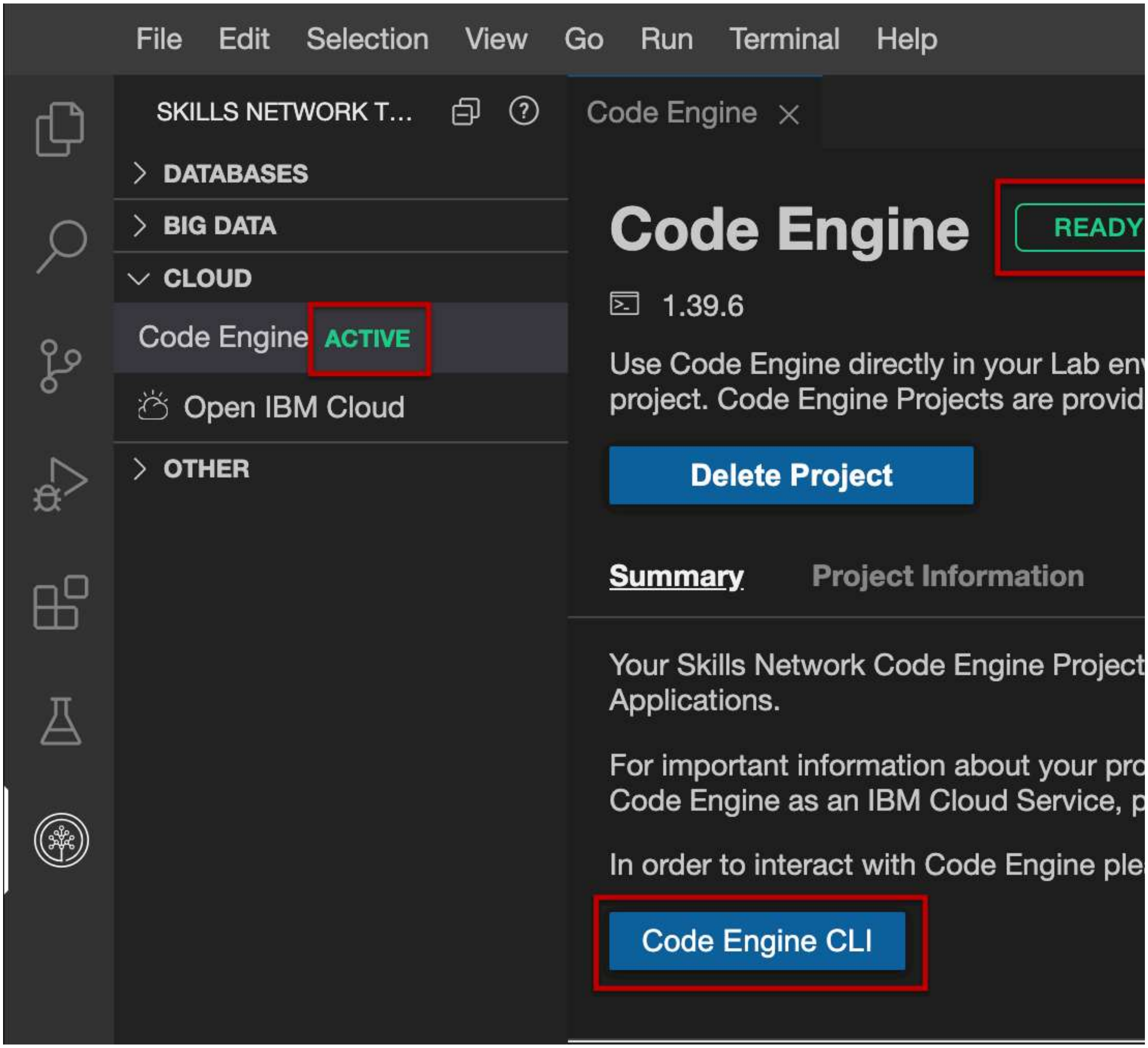
2. The code engine environment takes a while to prepare. You will see the progress status being indicated in the set up panel.



Code Engine

Use Code Engine directly in your Lab environment. Code Engine you'll need a project. Code Engine Pr at no charge.

3. Once the code engine set up is complete, you can see that it is active. Click on `Code Engine CLI` to begin the pre-configured CLI in the terminal below.



Code Engine

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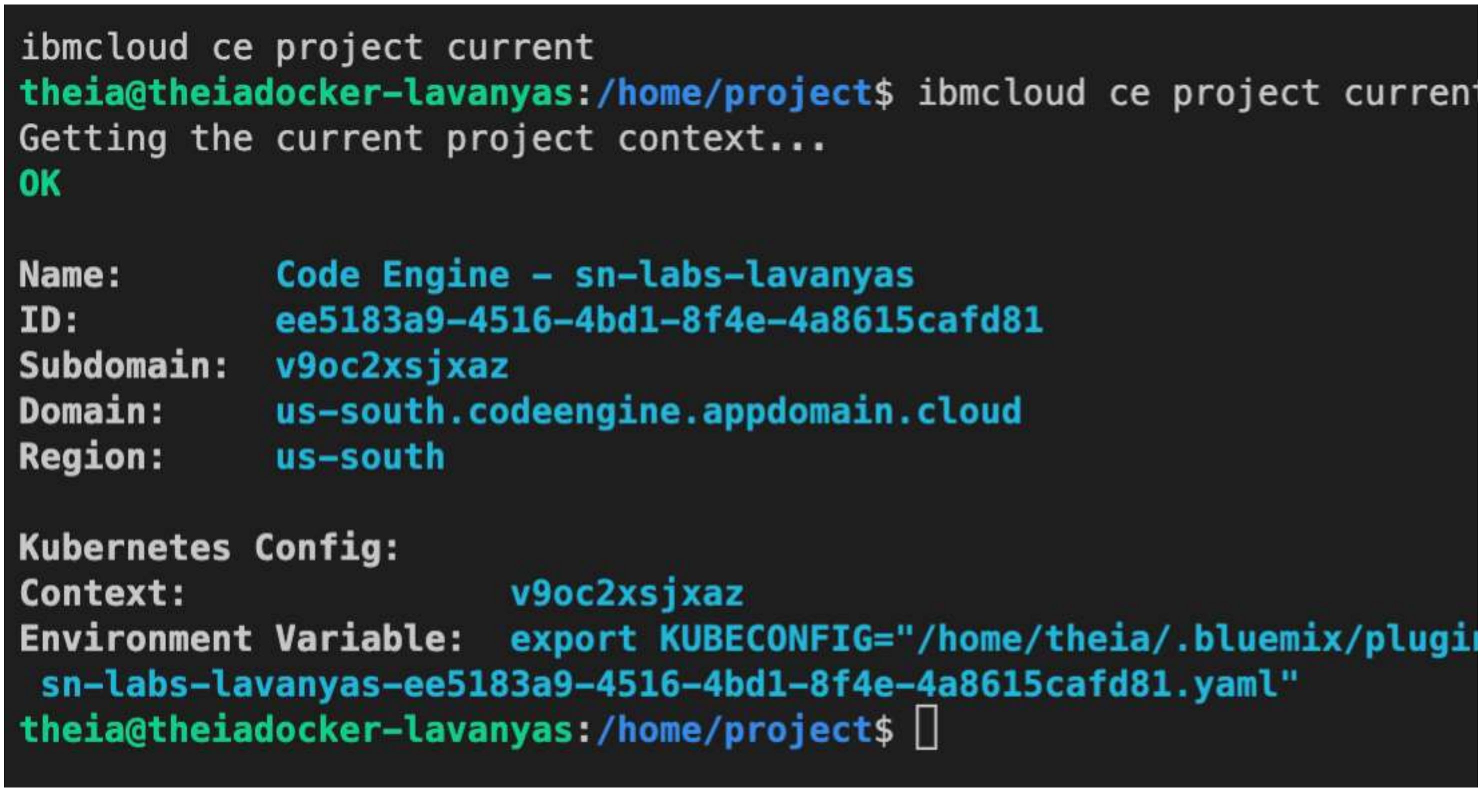
In order to interact with Code Engine ple

4. You will observe that the pre-configured CLI statrup and the home directory is set to the current directory. As a part of the pre-configuration, the project has been set up and Kubeconfig is set up. The details that are shown on the terminal.



```
ibmcloud ce project current
theia@theiadocker-lavanyas:/home/project$ ibmcloud ce project curren
Getting the current project context...
OK

Name:        Code Engine - sn-labs-lavanyas
ID:          ee5183a9-4516-4bd1-8f4e-4a8615cafd81
Subdomain:   v9oc2xsjxaz
Domain:      us-south.codeengine.appdomain.cloud
Region:      us-south

Kubernetes Config:
Context:                v9oc2xsjxaz
Environment Variable:   export KUBECONFIG="/home/theia/.bluemix/plugi
 sn-labs-lavanyas-ee5183a9-4516-4bd1-8f4e-4a8615cafd81.yaml"
theia@theiadocker-lavanyas:/home/project$
```

Deploy sentiment analysis on Code Engine as a microservice

1. In the code engine CLI, change to `server/djangoapp/microservices` directory.

```
cd xrwvm-fullstack_developer_capstone/server/djangoapp/microservices
```

Copied! Executed!

You have been provided with sentiment_analyzer.py which uses NLTK for sentiment analysis. You are also provided with a Dockerfile which you will use to deploy this service in Code Engine and consume it as a microservice. Take a look at these files.

2. Run the following command to docker build the sentiment analyzer app

   Please note the code engine instance is transient and is attached to your lab space username.

```
docker build . -t us.icr.io/${SN_ICR_NAMESPACE}/senti_analyzer
```

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3. Push the docker image by running the following command.

```
docker push us.icr.io/${SN_ICR_NAMESPACE}/senti_analyzer
```

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4. Deploy the senti_analyzer application on code engine.

```
ibmcloud ce application create --name sentianalyzer --image us.icr.io/${SN_ICR_NAMESPACE}/senti_analyzer --registry-secret icr-secret --port 5000
```

Copied!

5. Connect to the URL that is generated to access the microservices and check if the deployment is successful.
6. If the application deployment verification was successful, attach `/analyze/Fantastic services` to the URL in the browser to see if it returns **positive**. Take a screenshot of the sentiment along with the URL as shown below and save it as `sentiment_analyzer.png` or `sentiment_analyzer.jpg`.
7. Open `djangoapp/.env` and replace `your code engine deployment url` with the deployment URL you obtained above.

   It is essential to include the `/` at the end of the URL. Please ensure that it is copied.

```
sentiment_analyzer_url=your code engine deployment url
```

Copied!

8. Update `djangoapp/restapis.py` and add the following function in it to consume the microservice to analyze sentiments.

```
def analyze_review_sentiments(text):
    request_url = sentiment_analyzer_url+"analyze/"+text
    try:
        # Call get method of requests library with URL and parameters
        response = requests.get(request_url)
        return response.json()
    except Exception as err:
        print(f"Unexpected {err=}, {type(err)=}")
        print("Network exception occurred")
```

Copied!

Create Django views to get dealers

1. Update the `get_dealerships` view method in `djangoapp/views.py` with the following code. It will use the `get_request` you implemented in the `restapis.py` passing the `/fetchDealers` endpoint.

```
#Update the `get_dealerships` render list of dealerships all by default, particular state if state is passed
def get_dealerships(request, state="All"):
    if(state == "All"):
        endpoint = "/fetchDealers"
    else:
        endpoint = "/fetchDealers/"+state
    dealerships = get_request(endpoint)
    return JsonResponse({"status":200,"dealers":dealerships})
```

Copied!

- Configure the route for `get_dealerships` view method in `url.py`:

```
path(route='get_dealers', view=views.get_dealerships, name='get_dealers'),
    path(route='get_dealers/<str:state>', view=views.get_dealerships, name='get_dealers_by_state'),
```

Copied!

2. Create a `get_dealer_details` method which takes the dealer_id as a parameter in `views.py` and add a mapping urls.py. It will use the `get_request` you implemented in the `restapis.py` passing the `/fetchDealer/<dealer id>` endpoint.

▼ Click here for a sample

Add the following to views.py

```
def get_dealer_details(request, dealer_id):
    if(dealer_id):
        endpoint = "/fetchDealer/"+str(dealer_id)
        dealership = get_request(endpoint)
        return JsonResponse({"status":200,"dealer":dealership})
    else:
        return JsonResponse({"status":400,"message":"Bad Request"})
```

Copied!

Add the following to urls.py

```
    path(route='dealer/<int:dealer_id>', view=views.get_dealer_details, name='dealer_details'),
```

Copied!

3. Create `get_dealer_reviews` method which takes the dealer_id as a parameter in `views.py` and add a mapping urls.py. It will use the `get_request` you implemented in the `restapis.py` passing the `/fetchReviews/dealer/<dealer id>` endpoint. It will also call `analyze_review_sentiments` in `restapis.py` to consume the microservice and determine the sentiment of each of the reviews and set the value in the `review_detail` dictonary which is returned as a JsonResponse.

The value of `sentiment` attribute will be determined by sentiment analysis microservice. It could be `positive`, `neutral`, or `negative`.

▼ Click here for sample

Add the following to views.py

```
def get_dealer_reviews(request, dealer_id):
    # if dealer id has been provided
    if(dealer_id):
        endpoint = "/fetchReviews/dealer/"+str(dealer_id)
        reviews = get_request(endpoint)
        for review_detail in reviews:
            response = analyze_review_sentiments(review_detail['review'])
            print(response)
            review_detail['sentiment'] = response['sentiment']
        return JsonResponse({"status":200,"reviews":reviews})
    else:
        return JsonResponse({"status":400,"message":"Bad Request"})
```

Copied!

Add the following to urls.py

```
    path(route='reviews/dealer/<int:dealer_id>', view=views.get_dealer_reviews, name='dealer_details'),
```

Copied!

Create a Django view to post a dealer review

By now you have learned how to make various GET calls.

1. Open `restapis.py`, add a `post_review` method which will take a data dictionary in and call the `add_review` in the backend. The dictionary would take all the values required for the dealership review as key-value, pair.

```
def post_review(data_dict):
    request_url = backend_url+"/insert_review"
    try:
        response = requests.post(request_url,json=data_dict)
        print(response.json())
        return response.json()
    except:
        print("Network exception occurred")
```

Copied!

2. Open `views.py`, create a new `def add_review(request):` method to handle review post request. In the `add_review` view method:
    - First check if user is authenticated because only authenticated users can post reviews for a dealer.
    - Call the `post_request` method with the dictionary
    - Return the result of `post_request` to `add_review` view method. You may print the post response
    - Return a success status and message as JSON
    - Configure the route for `add_review` view in `url.py`.

```
def add_review(request):
    if(request.user.is_anonymous == False):
        data = json.loads(request.body)
        try:
            response = post_review(data)
            return JsonResponse({"status":200})
        except:
            return JsonResponse({"status":401,"message":"Error in posting review"})
    else:
        return JsonResponse({"status":403,"message":"Unauthorized"})
```

Copied!

```
    path(route='add_review', view=views.add_review, name='add_review'),
```

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3. Import the methods from `restapis.py` for use inside `views.py`.

```
from .restapis import get_request, analyze_review_sentiments, post_review
```

Copied!

Commit your updated project to GitHub

Commit all updates to the GitHub repository you created so that you can save your work.

If you need to refresh your memory on how to commit and push to GitHub in Theia lab environment, please refer to this lab Working with git in the Theia lab environment

External References

- Requests Developer Interface
- NLTK

Summary

In this lab, you have learned how to create proxy services to call the cloud functions in Django, convert their JSON results into Python objects such as `CarDealer` or `DealerReview`, and return the objects as a HTTPResonse.

In the next lab, you will create Django templates to present those objects.

Author(s)

Lavanya T S

Yan Luo

Other Contributor(s)

Upkar Lidder