

# **Lab-6 REST Data Service with Azure Functions**

---



# Azure

---

- Azure is **a cloud computing platform** provided by Microsoft that provides **a wide range of cloud services** including computing, analytics, storage, and networking.
- Azure allows users to host their applications and services on **Microsoft's servers**, rather than hosting them on the own hardware.
- **Azure Functions**, *Azure Container Instances ...*



# Azure Functions

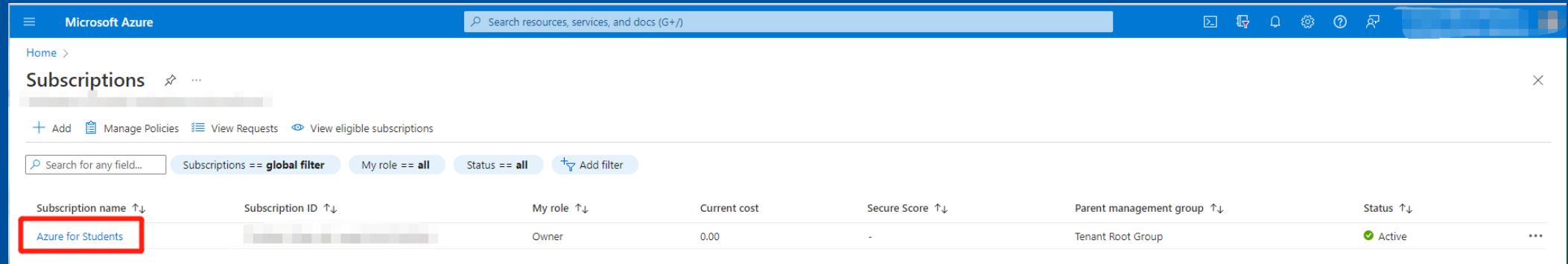
---

- *Azure Functions* is a **serverless** compute service provided by Azure.
- With *Azure Functions*, developers can write code for a specific functions, and **Azure Functions takes care of everything else**, including hosting, and maintaining the infrastructure.



# Prerequisite Check\*

- Azure Students account



The screenshot shows the Microsoft Azure portal interface. The top navigation bar includes the Microsoft Azure logo, a search bar, and various icons. The main content area is titled 'Subscriptions' and includes a search bar and filter buttons. A table lists the subscriptions, with the 'Azure for Students' subscription highlighted by a red box.

Subscription name ↑↓	Subscription ID ↑↓	My role ↑↓	Current cost	Secure Score ↑↓	Parent management group ↑↓	Status ↑↓
Azure for Students		Owner	0.00	-	Tenant Root Group	Active

- Azure Functions Core Tools version is 4.x

```
root@18.04:~# func --version
4.0.4785
```



# Create an Azure Function Project

- Create an Azure Function project in a folder named **DataService**.

```
func init DataService/ --python
```

- Project structure

```
○ DataService                                <-- project folder
  ■ CreateRecord                            <-- function folder
    • __init__.py
    • (etc...)
  ■ ReadRecords
    • __init__.py
    • (etc...)
```



# Create Functions(Endpoints)

---

- **CreateRecord**

```
func new --name CreateRecord --template "HTTP trigger" --authlevel "anonymous"
```

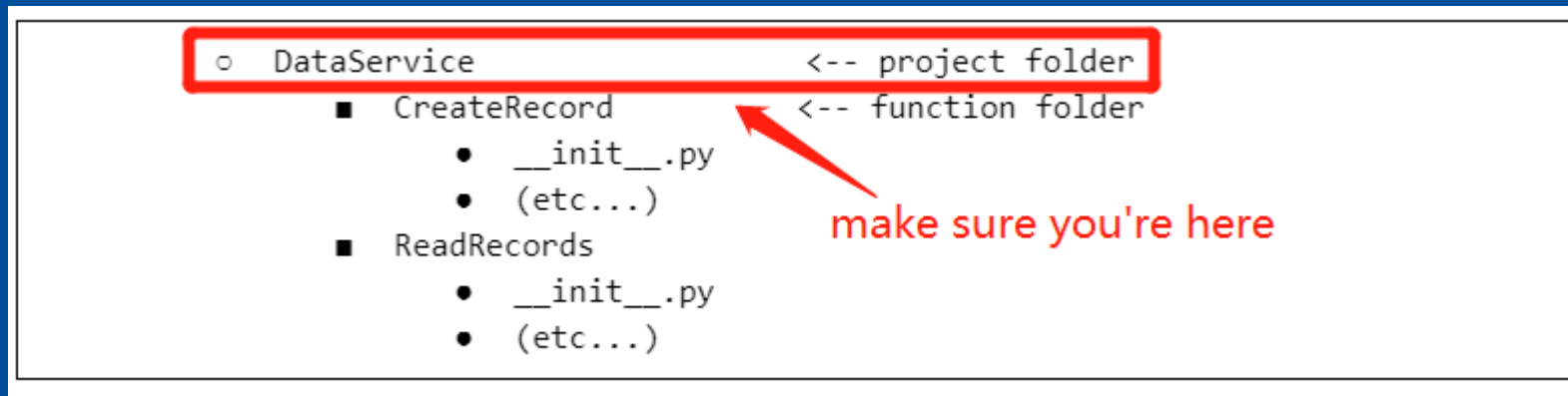
- **ReadRecords**

```
func new --name ReadRecords --template "HTTP trigger" --authlevel "anonymous"
```



# Run your Functions(Endpoints)

- Run your functions(endpoints) by starting the Azure Functions runtime host from your **DataService** folder.



```
func start
```



# Run your Functions(Endpoints) (cont.)

---

```
(.venv) root@... func start  
Found Python version 3.9.13 (python3).
```

## Azure Functions Core Tools

```
Core Tools Version:      4.0.4785 Commit hash: N/A (64-bit)  
Function Runtime Version: 4.10.4.19213
```

## Functions:

```
CreateRecord: [GET,POST] http://localhost:7071/api/CreateRecord
```

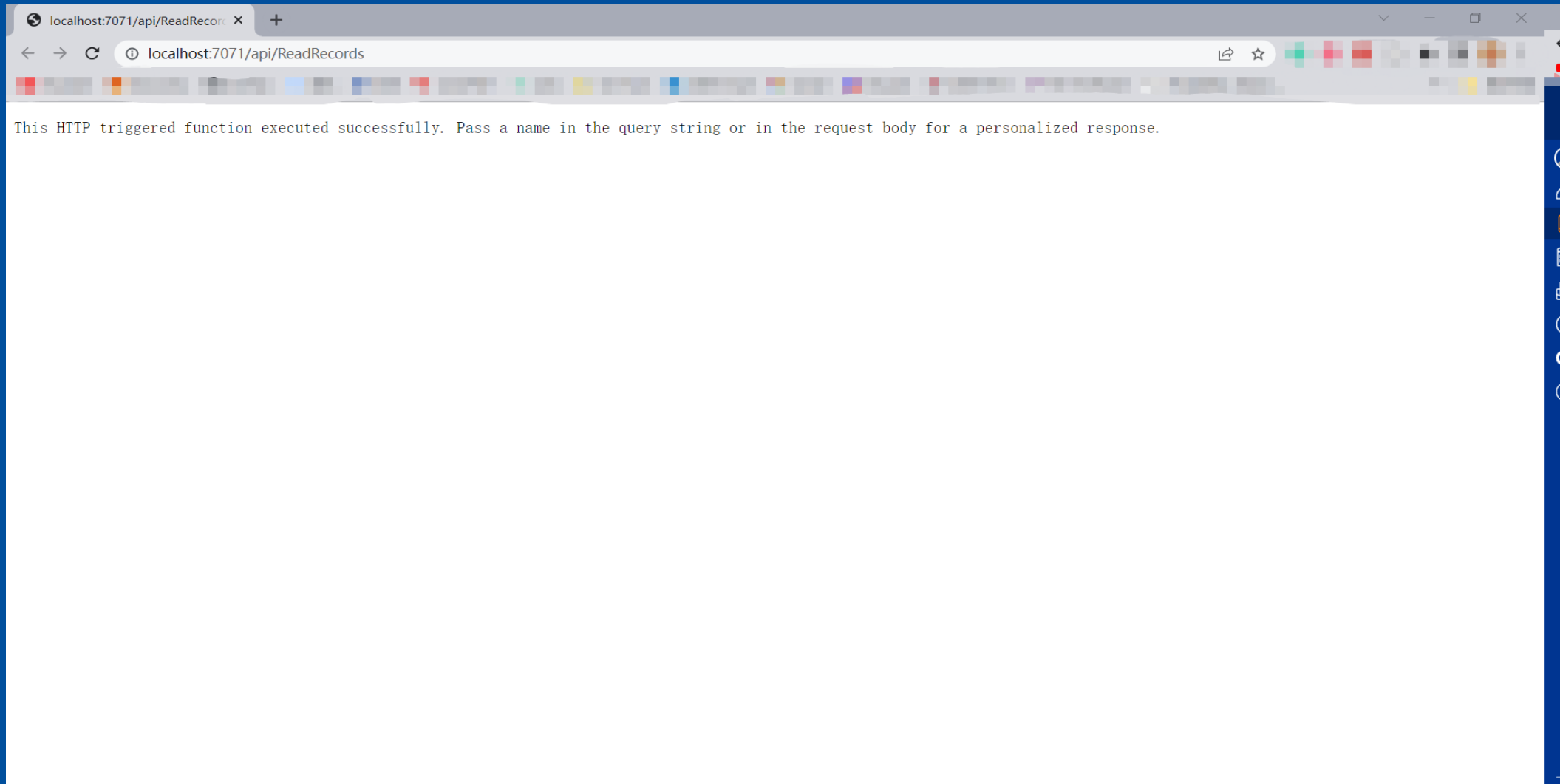
```
ReadRecords: [GET,POST] http://localhost:7071/api/ReadRecords
```

```
For detailed output, run func with --verbose flag.
```

```
[2023-03-07T19:03:55.424Z] Worker process started and initialized.
```



# Run your Functions(Endpoints) (cont.)



# CreateRecord

---

- Move your *data\_manager.py* into the *DataService* directory.

```
import data_manager
```

- Modify *CreateRecord / \_\_init\_\_.py*
  - a. receive requests through **POST** method (*req.get\_json()*)
  - b. use your data manager to process the request (*create(...)*)
  - c. return a response containing the result of the request



# ReadRecords

---

- Modify **ReadRecords / \_\_init\_\_.py**
  - a. receive requests through **GET** method (`req.params.get('query')`)
  - b. use your data manager to process the request (`read(...)`)
  - c. return query and matched documents (or all documents depending on whether the query is given and valid)



# ReadRecords (cont.)

```
localhost:7071/api/ReadRecords

NO VALID QUERY GIVEN, return ALL documents in the collection!
[{"_id": {"$oid": "6403d81cf7cc4f43fc328acb"}, "title": "test 1 2 3", "title2": "test 2 3 4"}, {"_id": {"$oid": "6403d912409a7c7017940067"}, "title": "test"}, {"_id": {"$oid": "6403d9e89860c503248c9f4a"}, "title": "test"}, {"_id": {"$oid": "6403da1531fb23d0b5a20140"}, "title": "test"}, {"_id": {"$oid": "6403da2b6352ab7666160879"}, "title": "test"}, {"_id": {"$oid": "6403daf2d936a48d86401667"}, "title": "test"}, {"_id": {"$oid": "6403dc81c23e9935149a8c37"}, "title": "test"}, {"_id": {"$oid": "6403dca0da7e9fba33e32bc"}, "title": "test"}, {"_id": {"$oid": "6403dcb66b1c4c44b18a0ff1"}, "title": "test"}, {"_id": {"$oid": "6403dcd467f069f8355c3092"}, "title": "test"}, {"_id": {"$oid": "6403dce6afb6aa18df72ce9"}, "title": "test"}, {"_id": {"$oid": "6403dce8afb6aa18df72cec"}, "title": "test"}, {"_id": {"$oid": "6403dcfd666d16ff5ae01a35"}, "title": "test"}, {"_id": {"$oid": "6403dd154cc6a22373faf892"}, "title": "test"}, {"_id": {"$oid": "6403dd2167aff1bd791578fa"}, "title": "test"}, {"_id": {"$oid": "6406c683e614823715ef1bab"}, "title": "test"}, {"_id": {"$oid": "6406c6bbe2d3dc27e6546366"}, "title": "test"}, {"_id": {"$oid": "64078d0a9c11099dfed72608"}, "title": "test"}, {"_id": {"$oid": "64078d5f7eaf695a6f27042b"}, "title": "test"}]
```

```
localhost:7071/api/ReadRecords?query={%20"title":%20"test"%20}

Your QUERY is: {'title': 'test'}
Matched documents: [{"_id": ObjectId('6403d912409a7c7017940067'), 'title': 'test'}, {"_id": ObjectId('6403d9e89860c503248c9f4a'), 'title': 'test'}, {"_id": ObjectId('6403da1531fb23d0b5a20140'), 'title': 'test'}, {"_id": ObjectId('6403da2b6352ab7666160879'), 'title': 'test'}, {"_id": ObjectId('6403daf2d936a48d86401667'), 'title': 'test'}, {"_id": ObjectId('6403dc81c23e9935149a8c37'), 'title': 'test'}, {"_id": ObjectId('6403dca0da7e9fba33e32bc'), 'title': 'test'}, {"_id": ObjectId('6403dcb66b1c4c44b18a0ff1'), 'title': 'test'}, {"_id": ObjectId('6403dcd467f069f8355c3092'), 'title': 'test'}, {"_id": ObjectId('6403dce6afb6aa18df72ce9'), 'title': 'test'}, {"_id": ObjectId('6403dce8afb6aa18df72cec'), 'title': 'test'}, {"_id": ObjectId('6403dcfd666d16ff5ae01a35'), 'title': 'test'}, {"_id": ObjectId('6403dd154cc6a22373faf892'), 'title': 'test'}, {"_id": ObjectId('6403dd2167aff1bd791578fa'), 'title': 'test'}]
```

# API testing

---

- Write unit tests for CreateRecord and ReadRecords.
- Put your unit tests in ***data\_service\_API\_tests.py***.
- Use ***requests*** module to do the testing.
- Print out and check the ***response***.



# API testing (cont.)

---

```
import requests

url = 'http://localhost:7071/api/CreateRecord'
title = {'title': 'test'}      # or whatever your data fields are

x = requests.post(url, json=title)
print("response text:", x.text)
print("response code:", x.status_code)
```

```
root@18.04:~# python data_service_API_tests.py
response text: The result of create operation is: True
response code: 200
```



# Submission (due 3/21 11:59 p.m.)

---

Canvas (**INDIVIDUAL** submission)

1. `__init__.py` (*CreateRecord*)

2. `__init__.py` (*ReadRecords*)

3. `data_service_API_tests.py`

4. a screenshot of your terminal

attach all four files in a single submission

or

submit a zip file

*(Azure Functions running, refer to page 8 of the slide)*





# More Questions?

---

