HW2

Github: https://github.com/ztjnwu/COEN241_Cloud-Computing

Tasks (70 pts)

1. **Provide a screenshot of invoking the figlet function (5 pts)**
   Solution:
   The input is echo “Great!” | faas-cli invoke figlet, and the result is as follows.

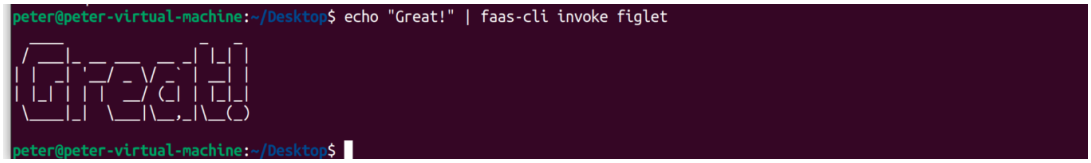

Fig 1. Output

2. **Provide a screenshot of running the following command (5 pts)**
   `Sudo journalctl -u faasd --lines 40`
   `The result is as follows.`

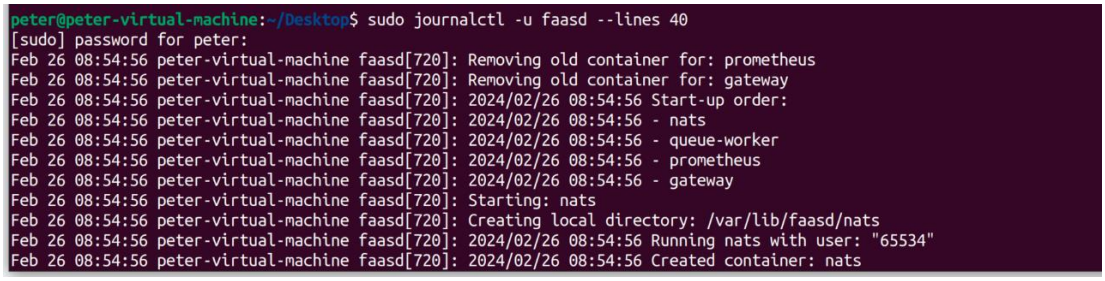

Fig 2. Output

3. **Complete slack-request/handler.py (10 pts)**
   Here is the content of the file “handler.py”.

```
import json

def handle(req):
    data = {
        "text": "Serverless Message",
        "attachments": [{
            "title": "The Awesome world of Cloud Computing! COEN 241",
            "fields": [{
                "title": "Amazing Level",
                "value": "100",
```

```
            "short": True
        }],
        "author_name": "tengjiao zhu",
        "author_icon": "",
        "image_url": ""
    },
    {
        "title": "About COEN 241",
        "text": "COEN 241 is the most awesome class ever!."
    },
    {
        "fallback": "Would you recommend COEN 241 to your friends?",
        "title": "Would you recommend COEN 241 to your friends?",
        "callback_id": "response123",
        "color": "#3AA3E3",
        "attachment_type": "default",
        "actions": [
            {
                "name": "recommend",
                "text": "Of Course!",
                "type": "button",
                "value": "recommend"
            },
            {
                "name": "definitely",
                "text": "Most Definitely!",
                "type": "button",
                "value": "definitely"
            }
        ]
    }]
}


return json.dumps(data)
```

Table 1. hadler.py

4. **Complete slack-interactive/handler.py (10 pts)**

Here is the content of the file “handler.py”.

```
import json
import urllib

def handle(req):
    urlstring = urllib.unquote(req).decode('utf8').strip('payload=')
    response = json.loads(urlstring)
    data = {
        "attachments": [
            {
                "replace_original": True,
```

```
            "response_type": "ephemeral",
            "fallback": "Required plain-text summary of the attachment.",
            "color": "#36a64f",
            "pretext": "Ahh yeah! Great choice, COEN 241 is absolutely amazing!",
            "author_name": "",
            "Author_link": "www.github.com/ztjnwu" ,
            "author_icon": "",
            "title": "COEN 241",
          "title_link": "https://www.scu.edu/engineering/academic-programs/department-
of-computer-engineering/graduate/course-descriptions/",
            "text": "Head over to COEN 241",
            "image_url": "https://www.scu.edu/media/offices/umc/scu-brand-
guidelines/visual-identity-amp-photography/visual-identity-toolkit/logos-amp-
seals/Mission-Dont3.png",
            "thumb_url": "https://www.scu.edu/engineering/academic-
programs/department-of-computer-engineering/graduate/course-descriptions/",
            "footer": "Slack Apps built on OpenFaas",
            "footer_icon": "https://a.slack-
edge.com/45901/marketing/img/_rebrand/meta/slack_hash_256.png",
            "ts": 123456789
        }
    ]
  }

  return json.dumps(data)
```

Table 2. hadler.py

5. **Provide a screenshot of your OpenFaaS gateway AFTER deploying figlet, slack-hand and slack-interactive functions (5 pts)**

Solution:

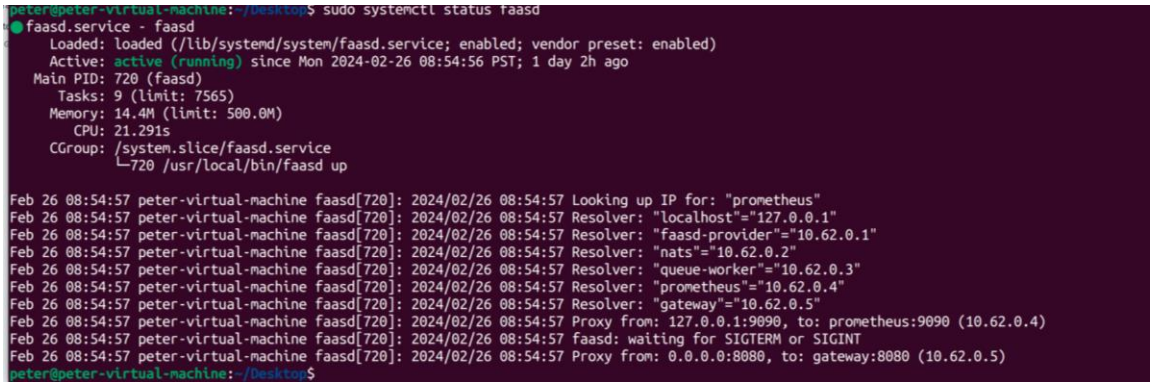

Fig 3. output

6. **Provide a screenshot of invoking slack-request and slack-interactive functions (5 pts**

Fig 4. output

```
peter@peter-virtual-machine:~/Desktop$ echo '{"test":"test"}' | faas-cli invoke slack-interactive
```

Fig 5. Output

7. **Complete the chatbot with a yml file (25pt)**

   The chatbot consists of two parts including handler.py and chatbot.yml, which are as follows.

```
import json
import os
import re
from time import gmtime, strftime
import subprocess
import requests


def handle(req):
    #Get the data from user side
    data  = json.loads(req)

    #Build the result for the query from a user
    result = {}
    if 'question' in data:
        query = data['question']
        if re.search(r'name', query):
            result = "chatbot"
        elif re.search(r'time', query):
            result = strftime("%a, %d %b %Y %H:%M:%S +0000", gmtime())
        else:
            result = {"error": "Invalid request payload"}

    elif 'figlet' in data:
        query = data['figlet']
        url = f'http://10.62.0.5:8080/function/figlet'
        response = requests.post(url, data=query)
        result = response.text

    else:
        result = {"error": "Invalid request payload"}

            #Print
    print(result)

    #Return
    return
```

Table 3. Handler.py

```
version: 1.0
provider:
  name: openfaas
  gateway: http://127.0.0.1:8080
functions:
  chatbot:
    lang: python3
    handler: ./chatbot
    image: ztjnwu/chatbot:latest
```

Table 4. chatbot.yml

8. **Provide a screenshot of invoking three different cases of the chatbot (5 pts)**
   Solution:
   1. The input is echo '{"question": "name"}' | faas-cli invoke chatbot, the result is as follows.

```
peter@peter-virtual-machine:~/Desktop$ echo '{"question":"name"}' | faas-cli invoke chatbot
chatbot
```

Fig 6. Output

   2. The input is echo '{"question": "time"}' | faas-cli invoke chatbot, the result is As follows.

```
peter@peter-virtual-machine:~/Desktop$ echo '{"question":"time"}' | faas-cli invoke chatbot
Tue, 27 Feb 2024 18:53:00 +0000
```

Fig 7. Output

   3. The input is echo '{"figlet": "Great"}' | faas-cli invoke chatbot, the result is As follows.

```
peter@peter-virtual-machine:~/Desktop$ echo '{"figlet":"Great"}' | faas-cli invoke chatbot
  ____                _
 / ___|_ __ ___  __ _| |_
| |  _| '__/ _ \/ _` | __|
| |_| | | |  __/ (_| | |_
 \____|_|  \___|\__,_|\__|
```

Fig 8. Output

Questions (30 pts)

1.What is the command to invoke the slack-request function (2 pts)?

a. Via Curl
   Curl http://localhost:8080/function/slack-request -d "Test"
b. Via faas-cli
   Echo "Test" | faas-cli invoke slack-request

2.What is the output you see when you invoke the slack-request function? (2 pts)

```
peter@peter-virtual-machine:~/Desktop$ echo "Test" | faas-cli invoke slack-request
{"text": "Serverless Message", "attachments": [{"fields": [{"short": true, "value": "100", "title": "Amazing Level"}], "author_ic
on": "", "image_url": "https://hub.docker.com/repository/docker/ztjnwu/slack-request/general", "author_name": "peter", "title": "
The Awesome world of Cloud Computing! COEN 241"}, {"text": "COEN 241 is the most awesome class ever!.", "title": "About COEN 241"
}, {"title": "Would you recommend COEN 241 to your friends?", "color": "#3AA3E3", "actions": [{"text": "Of Course!", "type": "but
ton", "name": "recommend", "value": "recommend"}, {"text": "Most Definitely!", "type": "button", "name": "definitely", "value": "
definitely"}], "callback_id": "response123", "fallback": "Would you recommend COEN 241 to your friends?", "attachment_type": "def
ault"}]}
```

3.What is the command to invoke the slack-interactive function? (2 pts)

a. Via curl
   Curl http://localhost:8080/function/slack-interactive -d '{"Test" : ""}'
b. Via faas-cli
   Echo '{"Test" : ""}' | faas-cli invoke slack-interactive

4.What is the output you see when you invoke the slack-interactive function? (2 pts)

```
peter@peter-virtual-machine:~/Desktop$ echo '{"test":"test"}' | faas-cli invoke slack-interactive
{"attachments": [{"footer": "Slack Apps built on OpenFaas", "author_link": "https://www.github.com/ztjnwu", "color": "#36a64f", "
text": "Head over to COEN 241", "title": "COEN 241", "ts": 123456789, "author_name": "", "title_link": "https://www.scu.edu/engin
eering/academic-programs/department-of-http://127.0.0.1:8080/function/slack-interactivecomputer-engineering/graduate/course-descr
iptions/", "image_url": "https://www.scu.edu/media/offices/umc/scu-brand-guidelines/visual-identity-amp-photography/visual-identi
ty-toolkit/logos-amp-seals/Mission-Dont3.png", "response_type": "ephemeral", "replace_original": true, "footer_icon": "https://a.
slack-edge.com/45901/marketing/img/_rebrand/meta/slack_hash_256.png", "pretext": "Ahh yeah! Great choice, COEN 241 is absolutely
amazing!", "fallback": "Required plain-text summary of the attachment.", "thumb_url": "https://www.scu.edu/engineering/academic-p
rograms/department-of-computer-engineering/graduate/course-descriptions/", "author_icon": "https://www.github.com/ztjnwu"}]}
```

5.How would you pass different arguments to the functions? (3 pts)

Solution:

One way to pass different parameters to a function is to use json data structure as input because it can contain different variables.

6.How would you change the slack-interactive function to react to different inputs? (3 pts)

Solution:

One way to achieve the goal is to add more key-value pairs to the file handler.py. If the given parameters from the input are in the data of type json, the function **handle(req)** returns the corresponding values.

7.How long does it take for the chat response to come back? (10pts)

a. For the first request that does not call figlet

Input	Round-trip time
"{"question": "name"}"	0.499

b. For the second request that does not call figlet

Input	Round-trip time
“{“question”: “time”}”	0.391

c. Average over 10 requests that do not call figlet

Input	Round-trip time
“{“question”: “name”}”	0.499
	0.372
	0.353
	0.362
	0.343
	0.345
	0.364
	0.35
	0.362
	0.38

Therefore, the average round-trip time is 0.373 second / request

Input	Round-trip time
	0.369

“{“question”: “time”}”	0.36
	0.362
	0.36
	0.371
	0.372
	0.377
	0.373
	0.371
	0.385

Thus, the average round-trip time is 0.37 second / request

d. For the first request that calls figlet

Input	**Round-trip time**
“{“figlet”: “Great”}”	0.413

e. For the second request that calls figlet

Input	**Round-trip time**
“{“figlet”: “Great”}”	0.365

f. For the second request that calls figlet that follows the first request that does not call figlet

Input	**Round-trip time**

“{“question”: “time”}”	0.374
“{“figlet”: “Great”}”	0.356

g. Average over 10 requests that do call figlet

Input	Round-trip time
“{“figlet”: “Great”}”	0.356
	0.364
	0.364
	0.382
	0.38
	0.371
	0.392
	0.381
	0.378
	0.384

As we can see in the table above, the average round-trip time is 0.375 second / request

8.Now try sending a series of requests to the chatbot in parallel.
At what queries per second does OpenFaaS add a new instance of the function? (6 pts)