

HW2

Task 1 Screenshot of invoking the figlet function:

```
hzhai96@hzhai96:~$ echo "Hello, FaaS, world" | faas-cli invoke figlet
```



```
hzhai96@hzhai96:~$ _
```

Task 2 Complete slack-request/handler.py

The completed slack-request/handler.py file will be updated to Github Repository.

Task 3 Complete slack-interactive/handler.py

The completed slack-interactive/handler.py file will be updated to Github Repository.

Task 4 Screenshot of running the command:

```
sudo journalctl -u faasd --lines 40
```

```
hzhai96@hzhai96:~/functions$ sudo journalctl -u faasd --lines 40
-- Logs begin at Fri 2023-02-17 20:51:38 UTC, end at Fri 2023-02-17 22:36:44 UTC. --
Feb 17 21:38:07 hzhai96 faasd[913]: 2023/02/17 21:38:07 - gateway
Feb 17 21:38:07 hzhai96 faasd[913]: 2023/02/17 21:38:07 - queue-worker
Feb 17 21:38:07 hzhai96 faasd[913]: Starting: nats
Feb 17 21:38:07 hzhai96 faasd[913]: Creating local directory: /var/lib/faasd/nats
Feb 17 21:38:07 hzhai96 faasd[913]: 2023/02/17 21:38:07 Running nats with user: "65534"
Feb 17 21:38:08 hzhai96 faasd[913]: 2023/02/17 21:38:08 Created container: nats
Feb 17 21:38:18 hzhai96 faasd[913]: 2023/02/17 21:38:18 nats has IP: 10.62.0.2
Feb 17 21:38:18 hzhai96 faasd[913]: 2023/02/17 21:38:18 Task: nats Container: nats
Feb 17 21:38:19 hzhai96 faasd[913]: Starting: prometheus
Feb 17 21:38:19 hzhai96 faasd[913]: Creating local directory: /var/lib/faasd/prometheus
Feb 17 21:38:19 hzhai96 faasd[913]: 2023/02/17 21:38:19 Running prometheus with user: "65534"
Feb 17 21:38:20 hzhai96 faasd[913]: 2023/02/17 21:38:20 Created container: prometheus
Feb 17 21:38:24 hzhai96 faasd[913]: 2023/02/17 21:38:24 prometheus has IP: 10.62.0.3
Feb 17 21:38:24 hzhai96 faasd[913]: 2023/02/17 21:38:24 Task: prometheus Container: prometheus
Feb 17 21:38:25 hzhai96 faasd[913]: Starting: basic-auth-plugin
Feb 17 21:38:26 hzhai96 faasd[913]: 2023/02/17 21:38:26 Created container: basic-auth-plugin
Feb 17 21:38:31 hzhai96 faasd[913]: 2023/02/17 21:38:31 basic-auth-plugin has IP: 10.62.0.4
Feb 17 21:38:31 hzhai96 faasd[913]: 2023/02/17 21:38:31 Task: basic-auth-plugin Container: basic-auth-plugin
Feb 17 21:38:31 hzhai96 faasd[913]: Starting: gateway
Feb 17 21:38:32 hzhai96 faasd[913]: 2023/02/17 21:38:32 Created container: gateway
Feb 17 21:38:35 hzhai96 faasd[913]: 2023/02/17 21:38:35 gateway has IP: 10.62.0.5
Feb 17 21:38:35 hzhai96 faasd[913]: 2023/02/17 21:38:35 Task: gateway Container: gateway
Feb 17 21:38:35 hzhai96 faasd[913]: Starting: queue-worker
Feb 17 21:38:36 hzhai96 faasd[913]: 2023/02/17 21:38:36 Created container: queue-worker
Feb 17 21:38:39 hzhai96 faasd[913]: 2023/02/17 21:38:39 queue-worker has IP: 10.62.0.6
Feb 17 21:38:39 hzhai96 faasd[913]: 2023/02/17 21:38:39 Task: queue-worker Container: queue-worker
Feb 17 21:38:39 hzhai96 faasd[913]: 2023/02/17 21:38:39 Supervisor init done in: 36 seconds
Feb 17 21:38:39 hzhai96 faasd[913]: 2023/02/17 21:38:39 Looking up IP for: "gateway"
Feb 17 21:38:39 hzhai96 faasd[913]: 2023/02/17 21:38:39 Resolver rebuilding map
Feb 17 21:38:39 hzhai96 faasd[913]: 2023/02/17 21:38:39 Resolver: "localhost"="127.0.0.1"
Feb 17 21:38:39 hzhai96 faasd[913]: 2023/02/17 21:38:39 Looking up IP for: "prometheus"
```

```

Feb 17 21:38:39 hzhai96 faasd[913]: 2023/02/17 21:38:39 faasd: waiting for SIGTERM or SIGINT
Feb 17 21:38:39 hzhai96 faasd[913]: 2023/02/17 21:38:39 Resolver: "faasd-provider"="10.62.0.1"
Feb 17 21:38:39 hzhai96 faasd[913]: 2023/02/17 21:38:39 Resolver: "nats"="10.62.0.2"
Feb 17 21:38:39 hzhai96 faasd[913]: 2023/02/17 21:38:39 Resolver: "prometheus"="10.62.0.3"
Feb 17 21:38:39 hzhai96 faasd[913]: 2023/02/17 21:38:39 Resolver: "basic-auth-plugin"="10.62.0.4"
Feb 17 21:38:39 hzhai96 faasd[913]: 2023/02/17 21:38:39 Resolver: "gateway"="10.62.0.5"
Feb 17 21:38:39 hzhai96 faasd[913]: 2023/02/17 21:38:39 Resolver: "queue-worker"="10.62.0.6"
Feb 17 21:38:39 hzhai96 faasd[913]: 2023/02/17 21:38:39 Proxy from: 127.0.0.1:9090, to: prometheus:9090 (10.62.0.3)
Feb 17 21:38:39 hzhai96 faasd[913]: 2023/02/17 21:38:39 Proxy from: 0.0.0.0:8080, to: gateway:8080 (10.62.0.5)

```

Task 5 Provide the screenshot of OpenFaaS gateway:

The screenshot displays the OpenFaaS gateway web interface. On the left, there's a sidebar with the OpenFaaS logo and a 'Deploy New Function' button. Below this is a search bar and a list of functions: 'figlet', 'slack-interactive', and 'slack-request'. The 'slack-request' function is selected. The main panel shows details for 'slack-request', including its status (Ready), number of replicas (1), and invocation count. It also lists the image (docker.io/hzhai96/slack-request:latest) and the function process (python index.py). At the bottom, there's an 'Invoke function' section with buttons for 'Text', 'JSON', and 'Download'. The 'Text' button is selected, and the 'Request body' field is visible.

Task 6 Provide the screenshot invoking slack-interactive and slack-request function:

Slack-request:

```

img/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-programs/department-of-computer-engineering/graduate/course-descriptions/", "author_icon": "https://avatars.githubusercontent.com/u/93065403?s=400&v=4"}]]}
hzhai96@hzhai96:~/functions$ curl -d '{"text": "Serverless Message", "attachments": [{"fields": [{"short": true, "value": "100", "title": "Amazing Level"}], "author_icon": "", "image_url": "https://www.scu.edu/media/offices/umc/scu-brand-guidelines/visual-identity-and-photography/visual-identity-toolkit/logos-and-seals/Mission-Dont3.png", "author_name": "Haoqian Zhai", "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": "button", "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": "default"}]]}' http://127.0.0.1:8080/function/slack-request
hzhai96@hzhai96:~/functions$ curl -d '{"text": "Serverless Message", "attachments": [{"fields": [{"short": true, "value": "100", "title": "Amazing Level"}], "author_icon": "", "image_url": "https://www.scu.edu/media/offices/umc/scu-brand-guidelines/visual-identity-and-photography/visual-identity-toolkit/logos-and-seals/Mission-Dont3.png", "author_name": "Haoqian Zhai", "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": "button", "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": "default"}]]}' http://127.0.0.1:8080/function/slack-request
hzhai96@hzhai96:~/functions$

```

Slack-interactive:

```

'slack-interactive/handler.py' 31L, 1650C written
hzhai96@hzhai96:~/functions$ curl -d '{"message": "request"}' http://127.0.0.1:8080/function/slack-interactive
{"attachments": [{"footer": "Slack Apps built on OpenFaaS", "author_link": "https://github.com/hzhai96/COEN241HW", "color": "#36a64f", "text": "Head over to COEN 241", "title": "COEN 241", "ts": "123456789", "author_name": "hzhai96", "title_link": "https://www.scu.edu/engineering/academic-programs/department-of-computer-engineering/graduate/course-descriptions/", "image_url": "https://www.scu.edu/media/offices/umc/scu-brand-guidelines/visual-identity-and-photography/visual-identity-toolkit/logos-and-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-programs/department-of-computer-engineering/graduate/course-descriptions/", "author_icon": "https://avatars.githubusercontent.com/u/93065403?s=400&v=4"}]]}
hzhai96@hzhai96:~/functions$ curl -d '{"message": "request"}' http://127.0.0.1:8080/function/slack-interactive
{"attachments": [{"footer": "Slack Apps built on OpenFaaS", "author_link": "https://github.com/hzhai96/COEN241HW", "color": "#36a64f", "text": "Head over to COEN 241", "title": "COEN 241", "ts": "123456789", "author_name": "hzhai96", "title_link": "https://www.scu.edu/engineering/academic-programs/department-of-computer-engineering/graduate/course-descriptions/", "image_url": "https://www.scu.edu/media/offices/umc/scu-brand-guidelines/visual-identity-and-photography/visual-identity-toolkit/logos-and-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-programs/department-of-computer-engineering/graduate/course-descriptions/", "author_icon": "https://avatars.githubusercontent.com/u/93065403?s=400&v=4"}]]}
hzhai96@hzhai96:~/functions$

```

Question 1 What is the command to invoke the slack-request function:

a. Via Curl

```
curl -d ‘ http://127.0.0.1:8080/function/slack-request
```

b. Via faas-cli

```
faas-cli invoke slack-request
```

Question 2 What is the output when invoke slack-request function:

The output is the json object in string format that defined in slack-request/handle.py file.

Question 3 What is the command to invoke the slack-interactive function:

a. Via Curl

```
curl -d ‘{“message”: “Hello, world!”}’ http://127.0.0.1:8080/function/slack-interactive
```

c. Via faas-cli

```
faas-cli invoke slack-interactive
```

Then input a json string: ‘{“message”: “hello”}’

Question 4 What is the output when invoke slack-request function:

The output is the json object in string format that defined in slack-interactive/handle.py file.

Question 5 How to pass different argument to functions?

When using curl, the argument can be passed by adding “-d” option and ‘<argument>’.

When using faas-cli, the argument can be passed when invoking the function. After using command “faas-cli invoke slack-interactive”, it will read from STDIN, now we can type in the argument and pass it to the function.

Question 6 How would you change the slack-interactive function to react to different inputs?

A simple way is to add an if statement to check if the json passed to function’s value, and then return the json object string. In the homework, the interactive function is modified to check if the input argument’s ‘message’ is equal to ‘request’. If so, the function will return the json string. The modified interactive function:

```

import json
import urllib

def handle(req):
    urlstring = urllib.unquote(req).decode('utf8').strip('payload=')
    response = json.loads(urlstring)
    if response['message'] == 'request':
        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": "hzhai96",
                    "author_link": "https://github.com/hzhai96/COEN241HW",
                    "author_icon": "https://avatars.githubusercontent.com/u/93065403?s=400&v=4",
                    "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-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)

```

The output:

```

[0] < Pushing slack-interactive [hzhai96/slack-interactive:latest] done.
[0] Worker done.
hzhai96@hzhai96:~/functions$ sudo faas-cli deploy -f ./slack-interactive.yml
Deploying: slack-interactive.
Function slack-interactive already exists, attempting rolling-update.

Deployed. 200 OK.
URL: http://127.0.0.1:8080/function/slack-interactive

hzhai96@hzhai96:~/functions$ curl -d '{"message": "request"}' http://127.0.0.1:8080/function/slack-interactive
{"attachments": [{"footer": "Slack Apps built on OpenFaas", "author_link": "https://github.com/hzhai96/COEN241HW", "color": "#36a64f", "text": "Head over to COEN 241", "title": "COEN 241", "ts": "123456789", "author_name": "hzhai96", "title_link": "https://www.scu.edu/engineering/academic-programs/department-of-computer-engineering/graduate/course-descriptions/", "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", "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-programs/department-of-computer-engineering/graduate/course-descriptions/", "author_icon": "https://avatars.githubusercontent.com/u/93065403?s=400&v=4"}]}
hzhai96@hzhai96:~/functions$

```