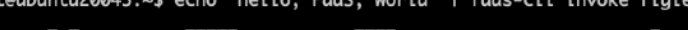


Name: Yu Bi
StudentID:1628995

1. Provide a screenshot of invoking the figlet function.

```
biu_test@ubuntu20045:~$ echo "Hello, FaaS, world" | faas-cli invoke figlet
```

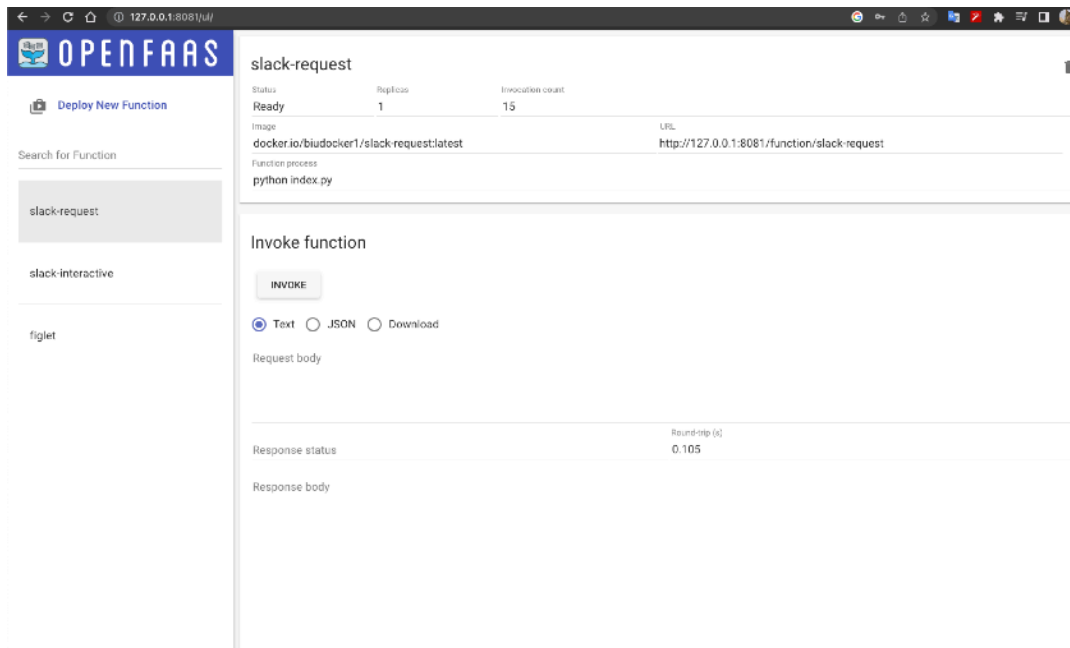


```
biu_test@ubuntu20045:~$
```

2. Provide a screenshot of running the following command:
sudo journalctl -u faasd --lines 40

```
-- Logs begin at Sun 2023-02-19 01:32:47 UTC, and at Sun 2023-02-19 06:48:39 UTC. --
Feb 19 01:46:21 ubuntu20045 faasd[618]: 2023/02/19 01:46:21 - gateway
Feb 19 01:46:21 ubuntu20045 faasd[618]: 2023/02/19 01:46:21 - queue-worker
Feb 19 01:46:21 ubuntu20045 faasd[618]: Starting: basic-auth-plugin
Feb 19 01:46:21 ubuntu20045 faasd[618]: 2023/02/19 01:46:21 Created container: basic-auth-plugin
Feb 19 01:46:21 ubuntu20045 faasd[618]: 2023/02/19 01:46:21 basic-auth-plugin has IP: 10.62.0.2
Feb 19 01:46:21 ubuntu20045 faasd[618]: 2023/02/19 01:46:21 Task: basic-auth-plugin Container: basic-auth-plugin
Feb 19 01:46:21 ubuntu20045 faasd[618]: Starting: nats
Feb 19 01:46:21 ubuntu20045 faasd[618]: Creating local directory: /var/lib/faasd/nats
Feb 19 01:46:21 ubuntu20045 faasd[618]: 2023/02/19 01:46:21 Running nats with user: "65534"
Feb 19 01:46:21 ubuntu20045 faasd[618]: 2023/02/19 01:46:21 Created container: nats
Feb 19 01:46:21 ubuntu20045 faasd[618]: 2023/02/19 01:46:21 nats has IP: 10.62.0.3
Feb 19 01:46:21 ubuntu20045 faasd[618]: 2023/02/19 01:46:21 Task: nats Container: nats
Feb 19 01:46:21 ubuntu20045 faasd[618]: Starting: prometheus
Feb 19 01:46:21 ubuntu20045 faasd[618]: Creating local directory: /var/lib/faasd/prometheus
Feb 19 01:46:21 ubuntu20045 faasd[618]: 2023/02/19 01:46:21 Running prometheus with user: "65534"
Feb 19 01:46:21 ubuntu20045 faasd[618]: 2023/02/19 01:46:21 Created container: prometheus
Feb 19 01:46:21 ubuntu20045 faasd[618]: 2023/02/19 01:46:21 prometheus has IP: 10.62.0.4
Feb 19 01:46:21 ubuntu20045 faasd[618]: 2023/02/19 01:46:21 Task: prometheus Container: prometheus
Feb 19 01:46:21 ubuntu20045 faasd[618]: Starting: gateway
Feb 19 01:46:22 ubuntu20045 faasd[618]: 2023/02/19 01:46:22 Created container: gateway
Feb 19 01:46:22 ubuntu20045 faasd[618]: 2023/02/19 01:46:22 gateway has IP: 10.62.0.5
Feb 19 01:46:22 ubuntu20045 faasd[618]: 2023/02/19 01:46:22 Task: gateway Container: gateway
Feb 19 01:46:22 ubuntu20045 faasd[618]: Starting: queue-worker
Feb 19 01:46:22 ubuntu20045 faasd[618]: 2023/02/19 01:46:22 Created container: queue-worker
Feb 19 01:46:22 ubuntu20045 faasd[618]: 2023/02/19 01:46:22 queue-worker has IP: 10.62.0.6
Feb 19 01:46:22 ubuntu20045 faasd[618]: 2023/02/19 01:46:22 Task: queue-worker Container: queue-worker
Feb 19 01:46:22 ubuntu20045 faasd[618]: 2023/02/19 01:46:22 Supervisor init done in: 1 second
Feb 19 01:46:22 ubuntu20045 faasd[618]: 2023/02/19 01:46:22 Looking up IP for: "prometheus"
Feb 19 01:46:22 ubuntu20045 faasd[618]: 2023/02/19 01:46:22 Resolver rebuilding map
Feb 19 01:46:22 ubuntu20045 faasd[618]: 2023/02/19 01:46:22 Resolver: "localhost"="127.0.0.1"
Feb 19 01:46:22 ubuntu20045 faasd[618]: 2023/02/19 01:46:22 Resolver: "faasd-provider"="10.62.0.1"
Feb 19 01:46:22 ubuntu20045 faasd[618]: 2023/02/19 01:46:22 Resolver: "basic-auth-plugin"="10.62.0.2"
Feb 19 01:46:22 ubuntu20045 faasd[618]: 2023/02/19 01:46:22 Resolver: "nats"="10.62.0.3"
Feb 19 01:46:22 ubuntu20045 faasd[618]: 2023/02/19 01:46:22 Resolver: "prometheus"="10.62.0.4"
Feb 19 01:46:22 ubuntu20045 faasd[618]: 2023/02/19 01:46:22 Resolver: "gateway"="10.62.0.5"
Feb 19 01:46:22 ubuntu20045 faasd[618]: 2023/02/19 01:46:22 Resolver: "queue-worker"="10.62.0.6"
Feb 19 01:46:22 ubuntu20045 faasd[618]: 2023/02/19 01:46:22 Looking up IP for: "gateway"
Feb 19 01:46:22 ubuntu20045 faasd[618]: 2023/02/19 01:46:22 Proxy from: 0.0.0.0:8080, to: gateway:8080 (10.62.0.5)
Feb 19 01:46:22 ubuntu20045 faasd[618]: 2023/02/19 01:46:22 faasd: waiting for SIGTERM or SIGINT
Feb 19 01:46:22 ubuntu20045 faasd[618]: 2023/02/19 01:46:22 Proxy from: 127.0.0.1:9090, to: prometheus:9090 (10.62.0.4)
--
--
--
lines 1-41/41 (END)
```

3. Provide a screenshot of your OpenFaaS gateway.



4. Provide a screenshot of invoking slack-request and slack-interactive functions.

```
biu_test@ubuntu20045:~/functions$ sudo faas-cli invoke slack-interactive
Reading from STDIN - hit (Control + D) to stop.
{}
{"attachments": [{"footer": "Slack Apps built on OpenFaaS", "author_link": "https://github.com/biu425/COEN241_HW", "color": "#36a64f", "text": "Head over to COEN 241", "title": "COEN 241", "ts": 123456789, "author_name": "", "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/79133344?s=400&u=f8a2b32bc2992d19d35dc6040a5ccb049b90f1b3&v=4"}]}
```

invoking slack-interactive

```
biu_test@ubuntu20045:~/functions$ sudo faas-cli invoke slack-request
[sudo] password for biu_test:
Reading from STDIN - hit (Control + D) to stop.
{"message": "Hello"}
{"text": "Serverless Message", "attachments": [{"fields": [{"short": true, "value": "100", "title": "Amazing Level"}], "author_icon": "", "image_url": "https://avatars.githubusercontent.com/u/79133344?s=400&u=f8a2b32bc2992d19d35dc6040a5ccb049b90f1b3&v=4", "author_name": "Yu Bi", "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"}]}
```

invoking slack-request

Questions:

1. What is the command to invoke the slack-request function?
Via Curl: `curl -d '{"message": "hello"}' "http://127.0.0.1:8080/function/slack-request"`
Via faas-cli: `sudo faas-cli invoke slack-request`, then enter any input in command line.

2. What is the command to invoke the slack-interactive function?
Via curl: `curl -d '{"message": "hello"}' "http://127.0.0.1:8080/function/slack-interactive"`
Via faas-cli: `sudo faas-cli invoke slack-interactive`, then enter a json string like:
`{"message": "hello"}`
3. What is the output you see when you invoke the slack-request function?
The json object in String format. The screenshot is listed above.
4. What is the output you see when you invoke the slack-interactive function?
The json object in String format. The screenshot is listed above.
5. How would you pass different arguments to the functions?
Via curl: Use `-d` option and add `<data>` as your argument, it will send the passed data to the server in the body of the HTTP message.
Via faas-cli: After `faas-cli invoke <functionName>`, you can type different arguments in command line, it will read the stdin.
6. How would you change the slack-interactive function to react to different inputs?
We can add the passed req to the return json object, so that different inputs will get the different output.
We can modify the handler.py into:

```
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": "https://github.com/biu425/COEN241_HW",
                "author_icon": "https://avatars.githubusercontent.com/u/79133344?s=400&u=f8a2b32bc2992d19d35d604a5ccb049b90f1b3&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",
                "payload": response,
                "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",
                "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)
```

Then we can get different response:

`curl -d '{"message": "request"}' "http://127.0.0.1:8080/function/slack-interactive"`

```
biu_test@ubuntu20045:~/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/biu425/COEN241_HW", "color": "#36a64f", "text": "Head over to COEN 241", "title": "COEN 241", "ts": 123456789, "author_name": "", "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/79133344?s=400&u=f8a2b32bc2992d19d35d604a5ccb049b90f1b3&v=4", "payload": {"message": "request"}}]}
```

```
curl -d '{"message": "hello"}' "http://127.0.0.1:8080/function/slack-interactive"
```

```
biu_test@ubuntu20045:~/functions$ curl -d '{"message": "hello"}' "http://127.0.0.1:8080/function/slack-interactive"
{"attachments": [{"footer": "Slack Apps built on OpenFaas", "author_link": "https://github.com/biu425/COEN241_HW", "color": "#36a64f", "text": "Head over to COEN 241", "title": "COEN 241", "ts": 123456789, "author_name": "", "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/79133344?s=400&u=f8a2b32bc2992d19d35dc6040a5ccb049b90f1b3&v=4", "payload": {"message": "hello"}}]}
```