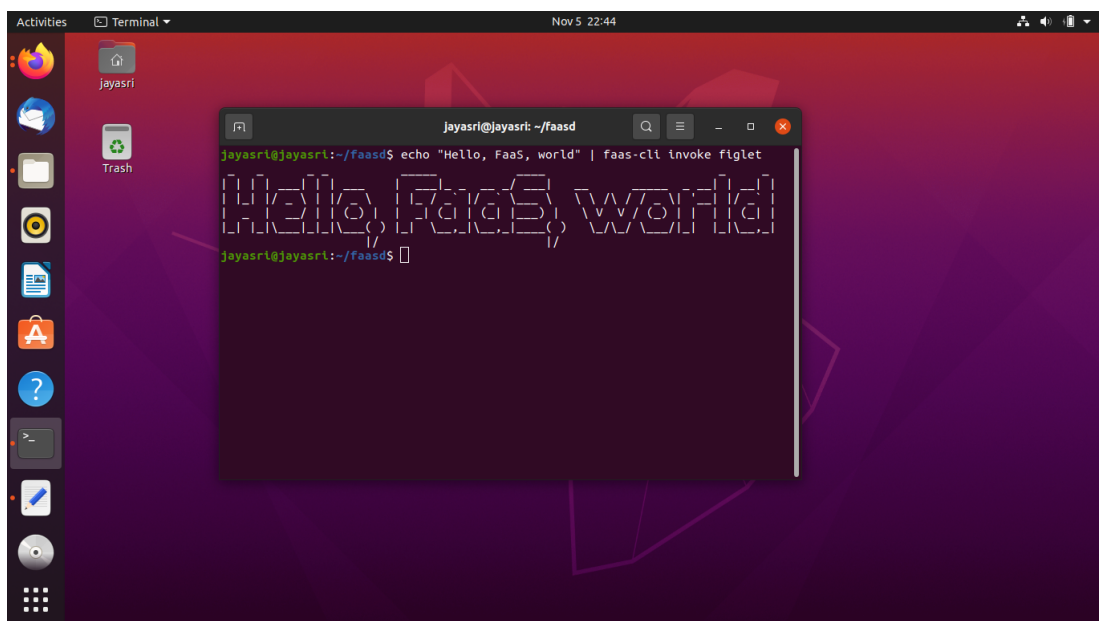
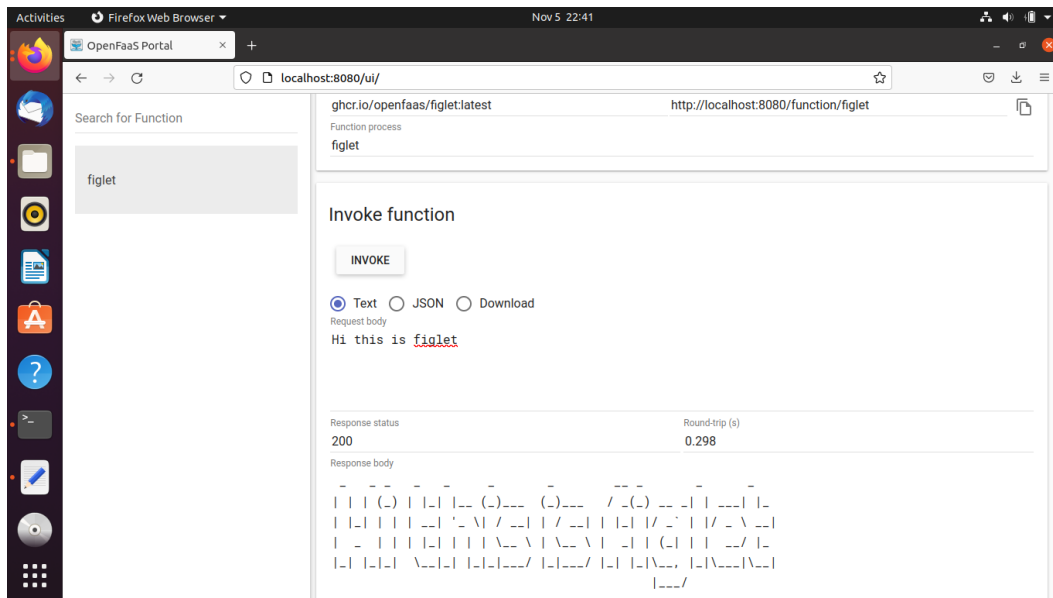


ASSIGNMENT 2

1. Screenshot of invoking the figlet function: Invoking via OpenFAas UI and faas-cli.
Prints the text in ascii form



2. slack-request/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": "Jayasri Ramakrishnan",
            "author_icon": "",
            "image_url": "https://github.com/rljayasri.png"
        },
        {
            "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)
```

3. slack-interactive/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": "Jayasri Ramakrishnan",  
                "author_link": "https://github.com/rljayasri",  
                "author_icon": "https://github.com/rljayasri.png",  
                "title": "COEN 241",  
                "title_link":  
"https://www.scu.edu/engineering/academic-programs/department-of-computer-e  
ngineering/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-e  
ngineering/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)

```

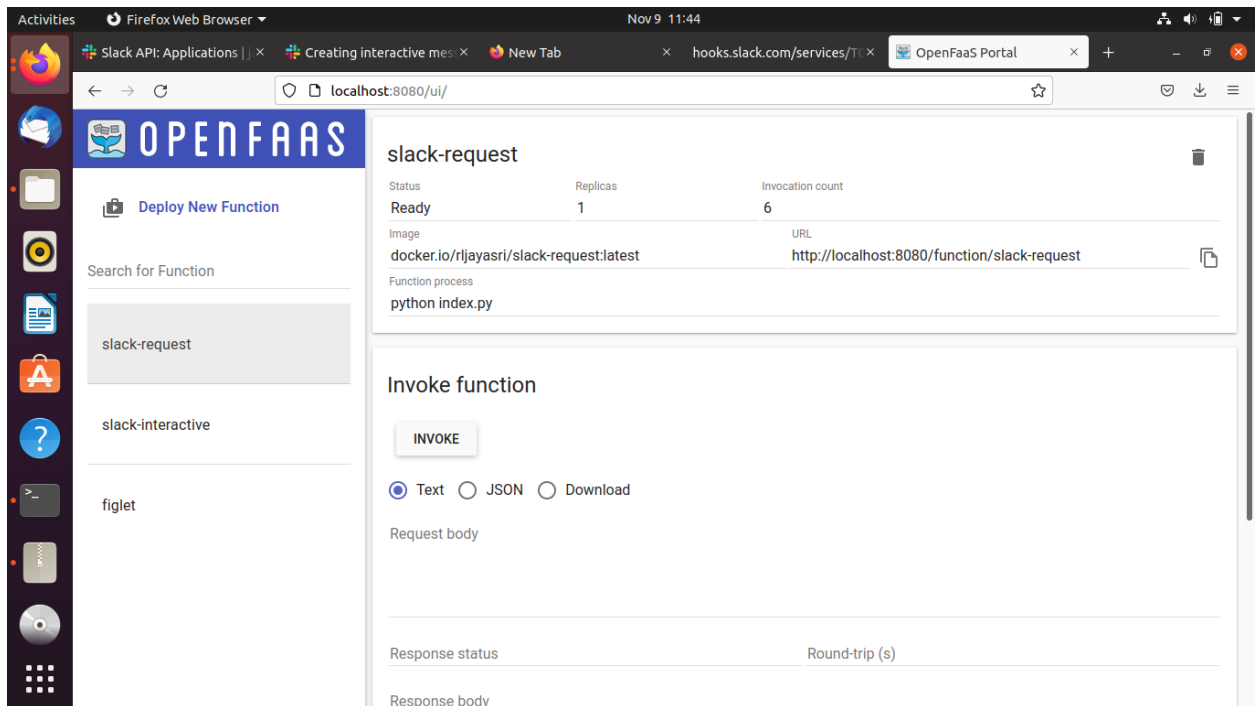
4. Screenshot of running `sudo journalctl -u faasd --lines 40`

```

-- Logs begin at Fri 2021-11-05 20:43:38 PDT, end at Tue 2021-11-09 11:51:32 PST. --
Nov 05 22:32:06 jayasri faasd[6800]: 2021/11/05 22:32:06 Start-up order:
Nov 05 22:32:06 jayasri faasd[6800]: 2021/11/05 22:32:06 - nats
Nov 05 22:32:06 jayasri faasd[6800]: 2021/11/05 22:32:06 - prometheus
Nov 05 22:32:06 jayasri faasd[6800]: 2021/11/05 22:32:06 - basic-auth-plugin
Nov 05 22:32:06 jayasri faasd[6800]: 2021/11/05 22:32:06 - gateway
Nov 05 22:32:06 jayasri faasd[6800]: 2021/11/05 22:32:06 - queue-worker
Nov 05 22:32:06 jayasri faasd[6800]: Starting: nats
Nov 05 22:32:09 jayasri faasd[6800]: 2021/11/05 22:32:09 Created container: nats
Nov 05 22:32:11 jayasri faasd[6800]: 2021/11/05 22:32:11 nats has IP: 10.62.0.2
Nov 05 22:32:11 jayasri faasd[6800]: 2021/11/05 22:32:11 Task: nats Container: nats
Nov 05 22:32:11 jayasri faasd[6800]: Starting: prometheus
Nov 05 22:32:12 jayasri faasd[6800]: 2021/11/05 22:32:12 Created container: prometheus
Nov 05 22:32:12 jayasri faasd[6800]: 2021/11/05 22:32:12 prometheus has IP: 10.62.0.3
Nov 05 22:32:12 jayasri faasd[6800]: 2021/11/05 22:32:12 Task: prometheus Container: prometheus
Nov 05 22:32:12 jayasri faasd[6800]: Starting: basic-auth-plugin
Nov 05 22:32:13 jayasri faasd[6800]: 2021/11/05 22:32:13 Created container: basic-auth-plugin
Nov 05 22:32:13 jayasri faasd[6800]: 2021/11/05 22:32:13 basic-auth-plugin has IP: 10.62.0.4
Nov 05 22:32:13 jayasri faasd[6800]: 2021/11/05 22:32:13 Task: basic-auth-plugin Container: basic-auth-plugin
Nov 05 22:32:13 jayasri faasd[6800]: Starting: gateway
Nov 05 22:32:15 jayasri faasd[6800]: 2021/11/05 22:32:15 Created container: gateway
Nov 05 22:32:16 jayasri faasd[6800]: 2021/11/05 22:32:16 gateway has IP: 10.62.0.5
Nov 05 22:32:16 jayasri faasd[6800]: 2021/11/05 22:32:16 Task: gateway Container: gateway
Nov 05 22:32:16 jayasri faasd[6800]: Starting: queue-worker
Nov 05 22:32:16 jayasri faasd[6800]: 2021/11/05 22:32:16 Created container: queue-worker
Nov 05 22:32:17 jayasri faasd[6800]: 2021/11/05 22:32:17 queue-worker has IP: 10.62.0.6
Nov 05 22:32:17 jayasri faasd[6800]: 2021/11/05 22:32:17 Task: queue-worker Container: queue-worker
Nov 05 22:32:17 jayasri faasd[6800]: 2021/11/05 22:32:17 Supervisor init done in: 1m4.278479494s
Nov 05 22:32:17 jayasri faasd[6800]: 2021/11/05 22:32:17 Looking up IP for: "gateway"
Nov 05 22:32:17 jayasri faasd[6800]: 2021/11/05 22:32:17 faasd: waiting for SIGTERM or SIGINT
Nov 05 22:32:17 jayasri faasd[6800]: 2021/11/05 22:32:17 Resolver rebuilding map
Nov 05 22:32:17 jayasri faasd[6800]: 2021/11/05 22:32:17 Resolver: "localhost"="127.0.0.1"
Nov 05 22:32:17 jayasri faasd[6800]: 2021/11/05 22:32:17 Resolver: "faasd-provider"="10.62.0.1"
Nov 05 22:32:17 jayasri faasd[6800]: 2021/11/05 22:32:17 Resolver: "nats"="10.62.0.2"
Nov 05 22:32:17 jayasri faasd[6800]: 2021/11/05 22:32:17 Resolver: "prometheus"="10.62.0.3"

```

5. Screenshot after deploying figlet, slack-request, slack-interactive



6. Screenshot of invoking slack-request and slack interactive

Activities Firefox Web Browser Nov 9 11:46

Slack API: Applications | x Creating Interactive mes x New Tab x hooks.slack.com/services/T x OpenFaaS Portal x

localhost:8080/ui/ 67%

OPENFAAS

Deploy New Function

Search for Function

- slack-request
- slack-interactive
- figlet

slack-request

Status: Ready Replicas: 1 Invocation count: 7

Image: docker.io/rjhayasri/slack-request:latest URL: http://localhost:8080/function/slack-request

Function process: python index.py

Invoke function

INVOKE

☒ Text ☐ JSON ☐ Download

Request body

Response status: 200 Round trip (s): 2.534

Response body

```
{
  "text": "Serverless Message",
  "attachments": [
    {
      "fields": [
        {
          "short": true,
          "value": "100",
          "title": "Amazing Level"
        }
      ],
      "author_icon": "",
      "image_url": "https://github.com/rjhayasri.png",
      "author_name": "Jayasri Ramesh"
    }
  ]
}
```

Activities Firefox Web Browser Nov 9 11:46

Slack API: Applications | x Creating Interactive mes x New Tab x hooks.slack.com/services/T x OpenFaaS Portal x

localhost:8080/ui/ 67%

```
{
  "short": true,
  "value": "100",
  "title": "Amazing Level"
},
{
  "author_icon": "",
  "image_url": "https://github.com/rjhayasri.png",
  "author_name": "Jayasri Ramesh",
  "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"
}
]
```

Activities Firefox Web Browser Nov 9 11:49

Slack API: Applications | x Creating interactive mes x New Tab x hooks.slack.com/services/T x OpenFaaS Portal x

localhost:8080/ui/ 67%

OPENFAAS

Deploy New Function

Search for Function

- slack-request
- slack-interactive
- figlet

slack-interactive

Status: Ready Replicas: 1 Invocation count: 6

Image: docker.io/rjayasri/slack-interactive:latest URL: http://localhost:8080/function/slack-interactive

Function process: python index.py

Invoke function

INVOKE

☐ Text ☒ JSON ☐ Download

Request body

```
{
  "name": "jay"
}
```

Response status: 200 Round trip (s): 1.318

Response body

```
{
  "attachments": [
    {
      "footer": "Slack Apps built on OpenFaaS",
      "author_link": "https://github.com/rjayasri",
      "color": "#36a64f",
      "text": "Head over to COEN 241",
      "title": "COEN 241",
      "ts": 123456789,
      "author_name": "Jayasri Ramesh",
      "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": "Ah 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://github.com/rjayasri.png"
    }
  ]
}
```

Activities Firefox Web Browser Nov 9 11:49

Slack API: Applications | x Creating interactive mes x New Tab x hooks.slack.com/services/T x OpenFaaS Portal x

localhost:8080/ui/ 67%

OPENFAAS

Deploy New Function

Search for Function

- slack-request
- slack-interactive
- figlet

slack-interactive

Status: Ready Replicas: 1 Invocation count: 6

Image: docker.io/rjayasri/slack-interactive:latest URL: http://localhost:8080/function/slack-interactive

Function process: python index.py

Invoke function

INVOKE

☐ Text ☒ JSON ☐ Download

Request body

```
{
  "name": "jay"
}
```

Response status: 200 Round trip (s): 1.318

Response body

```
{
  "attachments": [
    {
      "footer": "Slack Apps built on OpenFaaS",
      "author_link": "https://github.com/rjayasri",
      "color": "#36a64f",
      "text": "Head over to COEN 241",
      "title": "COEN 241",
      "ts": 123456789,
      "author_name": "Jayasri Ramesh",
      "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": "Ah 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://github.com/rjayasri.png"
    }
  ]
}
```

What is the command to invoke the slack-request function (4 pts)?

a. Via Curl

```
curl localhost:8080/function/slack-request
```

Here, input is actually not required, but faas-cli will look for an input. To replicate the command similar to faas-cli, it would be

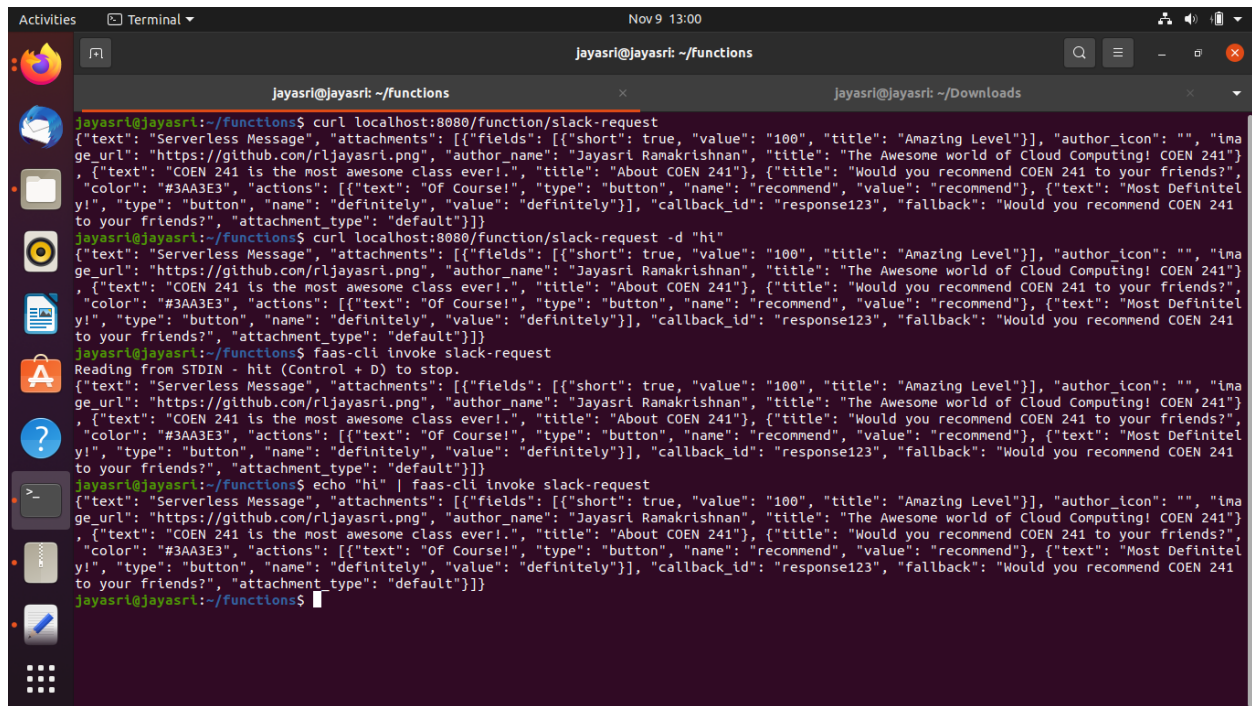
```
curl localhost:8080/function/slack-request -d "hi" but the first one would be the one used in slack app integration
```

Screenshot below after b.

b. Via faas-cli

As this function doesn't require any request body, we can invoke it two ways

```
faas-cli invoke slack-request and press ctrl+D or echo "hi" | faas-cli invoke slack-request
```

```
Jayasri@Jayasri: ~/functions
Jayasri@Jayasri: ~/functions
Jayasri@Jayasri:~/functions$ curl localhost:8080/function/slack-request
{"text": "Serverless Message", "attachments": [{"fields": [{"short": true, "value": "100", "title": "Amazing Level"}], "author_icon": "", "image_url": "https://github.com/r1jayasri.png", "author_name": "Jayasri Ramakrishnan", "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"}]}
Jayasri@Jayasri:~/functions$ curl localhost:8080/function/slack-request -d "hi"
{"text": "Serverless Message", "attachments": [{"fields": [{"short": true, "value": "100", "title": "Amazing Level"}], "author_icon": "", "image_url": "https://github.com/r1jayasri.png", "author_name": "Jayasri Ramakrishnan", "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"}]}
Jayasri@Jayasri:~/functions$ faas-cli invoke slack-request
Reading from STDIN - hit (Control + D) to stop.
{"text": "Serverless Message", "attachments": [{"fields": [{"short": true, "value": "100", "title": "Amazing Level"}], "author_icon": "", "image_url": "https://github.com/r1jayasri.png", "author_name": "Jayasri Ramakrishnan", "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"}]}
Jayasri@Jayasri:~/functions$ echo "hi" | faas-cli invoke slack-request
{"text": "Serverless Message", "attachments": [{"fields": [{"short": true, "value": "100", "title": "Amazing Level"}], "author_icon": "", "image_url": "https://github.com/r1jayasri.png", "author_name": "Jayasri Ramakrishnan", "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"}]}
Jayasri@Jayasri:~/functions$
```

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

The output we see is a json. It's a python object converted into a json string. This will be parsed as json as we have set content-type to application/json in the slack-request.yml file. The output can be seen in the screenshot above. It has three attachments

- Title: The awesome world of cloud computing! COEN 241 with subtitle amazing level and the picture of my github profile.
- About COEN 241 and text of it's the most amazing class ever
- Two buttons of recommendation - Of course and Most definitely

3. What is the command to invoke the slack-interactive function? (4 pts)

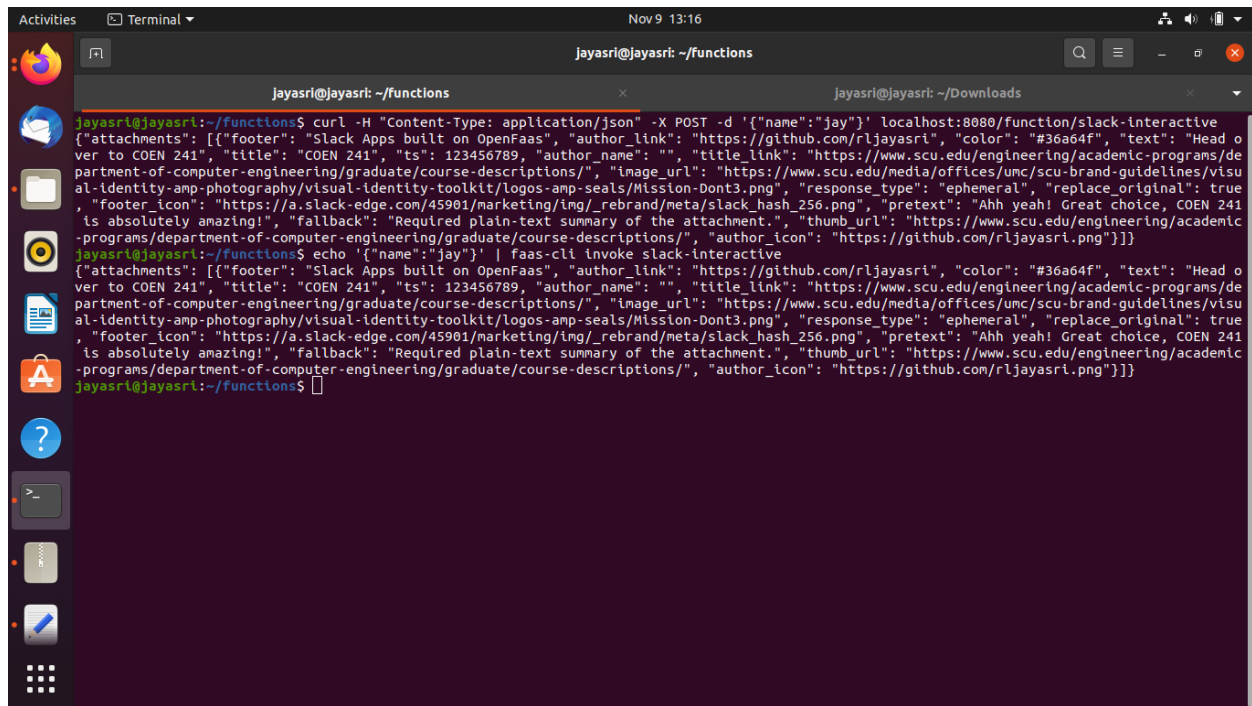
a. Via curl

```
curl -H "Content-Type: application/json" -X POST -d '{"name": "jay"}'
localhost:8080/function/slack-interactive
```

Screenshot after b

b. Via faas-cli

Echo `{'name': 'jay'}` | faas-cli invoke slack-interactive



```
Jayasri@Jayasri: ~/functions
Jayasri@Jayasri: ~/functions
Jayasri@Jayasri: ~/functions$ curl -H "Content-Type: application/json" -X POST -d '{"name": "jay"}' localhost:8080/function/slack-interactive
{"attachments": [{"footer": "Slack Apps built on OpenFaas", "author_link": "https://github.com/rljayasri", "color": "#36a64f", "text": "Head o
ver to COEN 241", "title": "COEN 241", "ts": 123456789, "author_name": "", "title_link": "https://www.scu.edu/engineering/academic-programs/de
partment-of-computer-engineering/graduate/course-descriptions/", "image_url": "https://www.scu.edu/media/offices/umc/scu-brand-guidelines/visu
al-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://github.com/rljayasri.png"}]}
Jayasri@Jayasri: ~/functions$ echo '{"name": "jay"}' | faas-cli invoke slack-interactive
{"attachments": [{"footer": "Slack Apps built on OpenFaas", "author_link": "https://github.com/rljayasri", "color": "#36a64f", "text": "Head o
ver to COEN 241", "title": "COEN 241", "ts": 123456789, "author_name": "", "title_link": "https://www.scu.edu/engineering/academic-programs/de
partment-of-computer-engineering/graduate/course-descriptions/", "image_url": "https://www.scu.edu/media/offices/umc/scu-brand-guidelines/visu
al-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://github.com/rljayasri.png"}]}
Jayasri@Jayasri: ~/functions$
```

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

The output is a json. (Python object converted to json string and parsed as json due to content-type setup). The output is the same regardless of any button chosen from slack-request. It consists of text saying, yes, recommending COEN 241 is a great choice and COEN 241 is amazing. It

provides a link to go to scu course descriptions under the hyperlink COEN 241. It also provides a thumbnail picture of SCU mission logo and clicking on that takes to scu course descriptions page.

I have changed the python handler to react to different inputs of button pressed. This can be seen in the summary text saying which button was pressed. The rest of the output remains the same.

5. How would you pass different arguments to the functions? (4 pts)

- -d to provide input in curl. In Faas-cli, echo can be piped. Different input parameters can be passed to the function by manipulating this json. If username and password has to be passed, the json can be modified to have that. In our slang request, we are sending which recommendation button was clicked to slack-interactive function
- Via the YAML file: Some arguments not exactly to the function but to determine how the function would behave and its environment can be set in the yml file like:
 - Gateway: To specify which host and port will the service come up on
 - Provider: here it would be faas
 - Functions: to specify the function specs
 - Lang: The language of the function can be specified
 - Handler: which function will be invoked and what it would do
 - Image: docker hub image
 - Environment: env can be set here
 - Content-type can be set in this yml
 - Build-option of dev/debug can be set here

- Additional packages required can be set here to passed
- Instead of yml file, --lang can be used to set language and --build-arg for other additional arguments like ADDITIONAL_PACKAGE
- The other arguments could be --filter, --parallel or -X/--header for curl commands

6. How would you change the slack-interactive function to react to different inputs? (4 pts)

1. Parse the request to get the payload
2. Get the action from it and the value of button pressed
3. Setting value to the button pressed based on equality condition
4. Appending value to pretext to be used in slack app
5. Changes shown in **red**

```
import json
import urllib

def handle(req):
    urlstring =
urllib.unquote(req).decode('utf8').strip('payload=')
    response = json.loads(urlstring)
    buttonPressed = response["actions"][0]["value"]
    value = (buttonPressed == 'recommend' and 'Of Course was
pressed') or 'Definitely was pressed!'

    data = {
        "attachments": [
            {
                "replace_original": True,
                "response_type": "ephemeral",
                "fallback": "Required plain-text summary of the
```

```

attachment.",
    "color": "#36a64f",
    "pretext": value+"Ahh yeah! Great choice, COEN
241 is absolutely amazing!",
    "author_name": "Jayasri Ramakrishnan",
    "author_link": "https://github.com/rljayasri",
    "author_icon":
"https://github.com/rljayasri.png",
    "title": "COEN 241",
    "title_link":
"https://www.scu.edu/engineering/academic-programs/departmen
-of-computer-engineering/graduate/course-descriptions/",
    "text": "Head over to COEN 241",
    "image_url":
"https://www.scu.edu/media/offices/umc/scu-brand-guidelines/v
isual-identity-amp-photography/visual-identity-toolkit/logos-
amp-seals/Mission-Dont3.png",
    "thumb_url":
"https://www.scu.edu/engineering/academic-programs/departmen
-of-computer-engineering/graduate/course-descriptions/",
    "footer": "Slack Apps built on OpenFaas",
    "footer_icon":
"https://a.slack-edge.com/45901/marketing/img/_rebrand/meta/s
lack_hash_256.png",
    "ts": 123456789
}
]
}
return json.dumps(data)

```

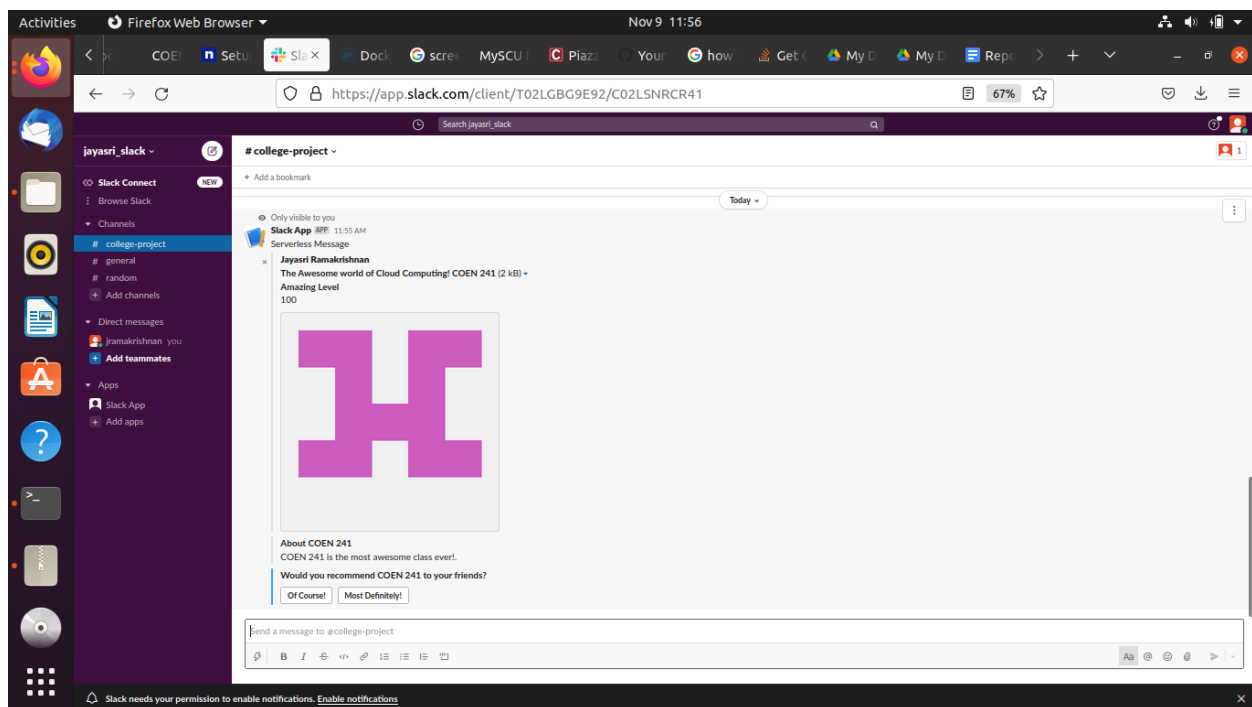
Extra Credit:

Link: <https://app.slack.com/client/T02LG9E92/C02LSNR41>

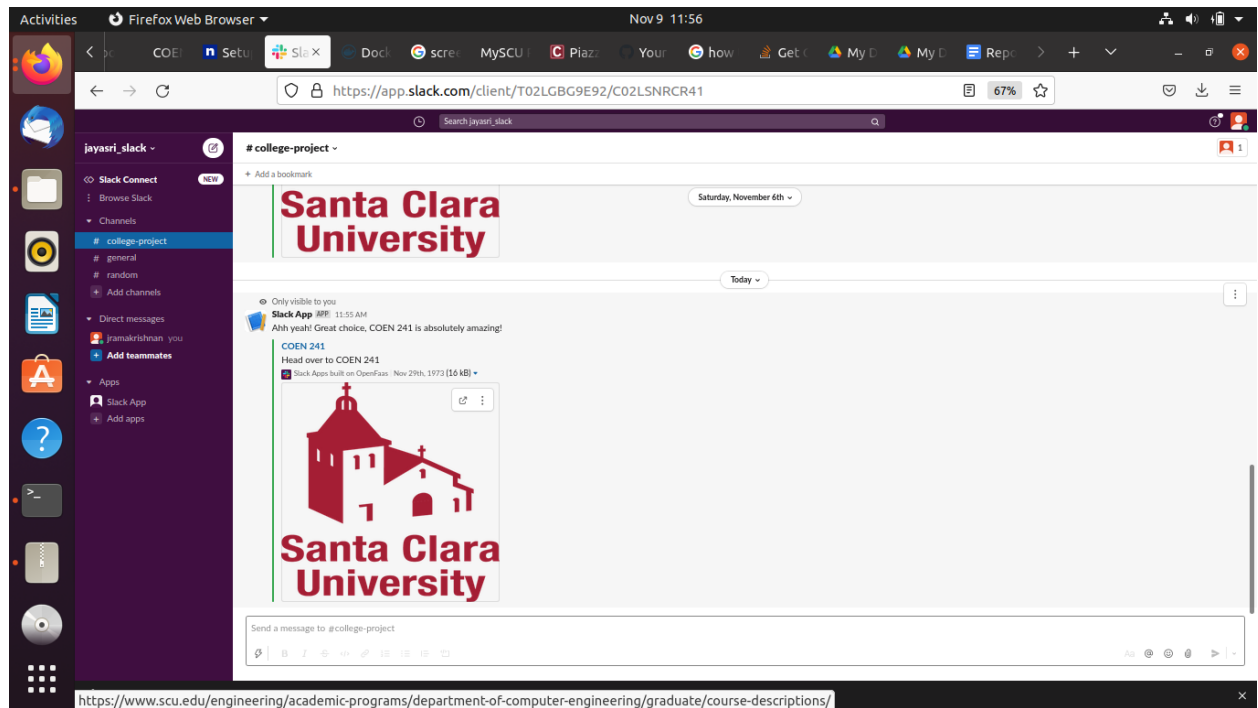
The ngrok tunnel might be down by the time this assignment is checked and hence you might get “dispatch-failed” blanket message in slack. Please let me know to bring it up again. Or, please look at the screenshots below for default slack-interactive and the one changed to handle different inputs

Screenshots:

1. Slack request screenshot:



2. Slack-interactive screenshot



3. Slack-interactive modified screenshot: The summary text showing which button as pressed

