Your Own Serverless Infrastructure Homework 2

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Deploy OpenFaaS


```
+ sudo curl -fSLs https://raw.githubusercontent.com/openfaas/faasd/0.16.8-rc1/hack/faasd.service --o
utput hack/faasd.service
+ sudo /usr/local/bin/faasd install
2023/02/17 02:52:08 Writing to: "/var/lib/faasd/secrets/basic-auth-password"
2023/02/17 02:52:08 Writing to: "/var/lib/faasd/secrets/basic-auth-user"
Check status with:
  sudo journalctl -u faasd --lines 100 -f

Login with:
  sudo cat /var/lib/faasd/secrets/basic-auth-password | faas-cli login -s
+ install_caddy
+ '[' '!' -z '' ']'
+ echo 'Skipping caddy installation as FAASD_DOMAIN.'
Skipping caddy installation as FAASD_DOMAIN.
pyeole@pyeole:~/faasd$ sudo systemctl status faasd
● faasd.service - faasd
     Loaded: loaded (/lib/systemd/system/faasd.service; enabled; vendor preset: enabled)
     Active: active (running) since Fri 2023-02-17 02:52:08 UTC; 22s ago
   Main PID: 2177 (faasd)
      Tasks: 7 (limit: 3309)
     Memory: 16.4M (limit: 500.0M)
        CPU: 2.571s
     CGroup: /system.slice/faasd.service
             └─2177 /usr/local/bin/faasd up

Feb 17 02:52:08 pyeole faasd[2177]: 2023/02/17 02:52:08 Supervisor created in: Less than a second
Feb 17 02:52:08 pyeole faasd[2177]: Preparing gateway with image: ghcr.io/openfaas/gateway:0.26.2
Feb 17 02:52:13 pyeole faasd[2177]: Prepare done for: ghcr.io/openfaas/gateway:0.26.2, 12.37MB
Feb 17 02:52:13 pyeole faasd[2177]: Preparing queue-worker with image: ghcr.io/openfaas/queue-worke>
Feb 17 02:52:15 pyeole faasd[2177]: Prepare done for: ghcr.io/openfaas/queue-worker:0.13.3, 3.757MB
Feb 17 02:52:15 pyeole faasd[2177]: Preparing basic-auth-plugin with image: ghcr.io/openfaas/basic->
Feb 17 02:52:19 pyeole faasd[2177]: Prepare done for: ghcr.io/openfaas/basic-auth:0.25.5, 6.901MB
Feb 17 02:52:19 pyeole faasd[2177]: Preparing nats with image: docker.io/library/nats-streaming:0.2>
Feb 17 02:52:21 pyeole faasd[2177]: Prepare done for: docker.io/library/nats-streaming:0.25.3, 7.02>
Feb 17 02:52:21 pyeole faasd[2177]: Preparing prometheus with image: docker.io/prom/prometheus:v2.4>

pyeole@pyeole:~/faasd$ sudo _
```



```
sername admin --password-stdin
faas-clilogin: command not found
pyeole@pyeole:~/faasd$ sudo cat /var/lib/faasd/secrets/basic-auth-password | faas-cli login --userna
me admin --password-stdin
Calling the OpenFaaS server to validate the credentials...
credentials saved for admin http://127.0.0.1:8080
pyeole@pyeole:~/faasd$
```

Verify OpenFaaS Installation


```
credentials saved for admin http://127.0.0.1:8080
pyeole@pyeole:~/faasd$ sudo systemctl status faasd-provider
● faasd-provider.service - faasd-provider
     Loaded: loaded (/lib/systemd/system/faasd-provider.service; enabled; vendor preset: enabled)
     Active: active (running) since Fri 2023-02-17 02:52:08 UTC; 21min ago
   Main PID: 2170 (faasd)
      Tasks: 6 (limit: 3309)
     Memory: 13.4M (limit: 500.0M)
        CPU: 1.602s
     CGroup: /system.slice/faasd-provider.service
             └─2170 /usr/local/bin/faasd provider

Feb 17 02:52:08 pyeole systemd[1]: Started faasd-provider.
Feb 17 02:52:08 pyeole faasd[2170]: 2023/02/17 02:52:08 faasd-provider starting..          Service Ti▷
Feb 17 02:52:08 pyeole faasd[2170]: faasd version: 0.16.8-rc1          commit: 4d6b6dfdc5ccc827742dea▷
Feb 17 02:52:08 pyeole faasd[2170]: 2023/02/17 02:52:08 Writing network config...
Feb 17 02:52:08 pyeole faasd[2170]: 2023/02/17 02:52:08 Listening on TCP port: 8081
lines 1-15/15 (END)
```

Logs for faasd


```
Feb 17 02:52:36 pyeole faasd[2177]: Creating local directory: /var/lib/faasd/prometheus
Feb 17 02:52:36 pyeole faasd[2177]: 2023/02/17 02:52:36 Running prometheus with user: "65534"
Feb 17 02:52:36 pyeole faasd[2177]: 2023/02/17 02:52:36 Created container: prometheus
Feb 17 02:52:36 pyeole faasd[2177]: 2023/02/17 02:52:36 prometheus has IP: 10.62.0.4
Feb 17 02:52:36 pyeole faasd[2177]: 2023/02/17 02:52:36 Task: prometheus          Container: promethe▷
Feb 17 02:52:36 pyeole faasd[2177]: Starting: gateway
Feb 17 02:52:36 pyeole faasd[2177]: 2023/02/17 02:52:36 Created container: gateway
Feb 17 02:52:36 pyeole faasd[2177]: 2023/02/17 02:52:36 gateway has IP: 10.62.0.5
Feb 17 02:52:36 pyeole faasd[2177]: 2023/02/17 02:52:36 Task: gateway          Container: gateway
Feb 17 02:52:36 pyeole faasd[2177]: Starting: queue-worker
Feb 17 02:52:36 pyeole faasd[2177]: 2023/02/17 02:52:36 Created container: queue-worker
Feb 17 02:52:36 pyeole faasd[2177]: 2023/02/17 02:52:36 queue-worker has IP: 10.62.0.6
Feb 17 02:52:36 pyeole faasd[2177]: 2023/02/17 02:52:36 Task: queue-worker          Container: queue-▷
Feb 17 02:52:36 pyeole faasd[2177]: 2023/02/17 02:52:36 Supervisor init done in: 27 seconds
Feb 17 02:52:36 pyeole faasd[2177]: 2023/02/17 02:52:36 Resolver rebuilding map
Feb 17 02:52:36 pyeole faasd[2177]: 2023/02/17 02:52:36 Resolver: "localhost"="127.0.0.1"
Feb 17 02:52:36 pyeole faasd[2177]: 2023/02/17 02:52:36 Resolver: "faasd-provider"="10.62.0.1"
Feb 17 02:52:36 pyeole faasd[2177]: 2023/02/17 02:52:36 Resolver: "basic-auth-plugin"="10.62.0.2"
Feb 17 02:52:36 pyeole faasd[2177]: 2023/02/17 02:52:36 Resolver: "nats"="10.62.0.3"
Feb 17 02:52:36 pyeole faasd[2177]: 2023/02/17 02:52:36 Resolver: "prometheus"="10.62.0.4"
Feb 17 02:52:36 pyeole faasd[2177]: 2023/02/17 02:52:36 Resolver: "gateway"="10.62.0.5"
Feb 17 02:52:36 pyeole faasd[2177]: 2023/02/17 02:52:36 Resolver: "queue-worker"="10.62.0.6"
Feb 17 02:52:36 pyeole faasd[2177]: 2023/02/17 02:52:36 Looking up IP for: "prometheus"

pyeole@pyeole:~/faasd$
```

```
pyeole@pyeole:~/faasd$ sudo journalctl -u faasd-provider --lines 40
Feb 17 02:52:08 pyeole systemd[1]: Started faasd-provider.
Feb 17 02:52:08 pyeole faasd[2170]: 2023/02/17 02:52:08 faasd-provider starting..        Service Ti>
Feb 17 02:52:08 pyeole faasd[2170]: faasd version: 0.16.8-rc1        commit: 4d6b6dfdc5ccc827742dea>
Feb 17 02:52:08 pyeole faasd[2170]: 2023/02/17 02:52:08 Writing network config...
Feb 17 02:52:08 pyeole faasd[2170]: 2023/02/17 02:52:08 Listening on TCP port: 8081
lines 1-5/5 (END)
```

Logs for OpenFaaS services

```
pyeole@pyeole:~/faasd$ sudo journalctl -t default:gateway --lines 40
-- No entries --
pyeole@pyeole:~/faasd$ sudo journalctl -t default:nats --lines 40
-- No entries --
pyeole@pyeole:~/faasd$ sudo journalctl -t default:queue-worker --lines 40
-- No entries --
pyeole@pyeole:~/faasd$ sudo journalctl -t default:prometheus --lines 40
-- No entries --
pyeole@pyeole:~/faasd$
```

Trying out a Function from the Store

```
pyeole@pyeole:~/faasd$ faas-cli store list

FUNCTION            DESCRIPTION
NodeInfo            Get info about the machine that you'r...
alpine              An Alpine Linux shell, set the "fproc...
env                 Print the environment variables prese...
sleep               Simulate a 2s duration or pass an X-S...
shasum              Generate a shasum for the given input
Figlet              Generate ASCII logos with the figlet CLI
curl                Use curl for network diagnostics, pas...
printer             Print out the HTTP headers and body o...
SentimentAnalysis   Python function provides a rating on ...
hey                 HTTP load generator, ApacheBench (ab)...
nslookup            Query the nameserver for the IP addre...
ASCII Cows          Generate a random ASCII cow

pyeole@pyeole:~/faasd$
```

```
pyeole@pyeole:~/faasd$ faas-cli store deploy figlet

Deployed. 200 OK.
URL: http://127.0.0.1:8080/function/figlet

pyeole@pyeole:~/faasd$
```

```
pyeole@pyeole:~/faasd$ faas-cli store inspect figlet
Info for: Figlet

Name           figlet
Description    Generate ASCII logos with the figlet CLI
Image          ghcr.io/openfaas/figlet:latest
Process        figlet
Repo URL       https://github.com/openfaas/store-functions

pyeole@pyeole:~/faasd$ _
```

Signing Up for DockerHub

Dockerhub account was created in this step.

Writing Your Own Function

```
pyeole@pyeole:~/faasd$ cd ~/functions/
pyeole@pyeole:~/functions$ faas-cli new --lang python slack-request
2023/02/17 03:28:25 No templates found in current directory.
2023/02/17 03:28:26 Attempting to expand templates from https://github.com/openfaas/templates.git
2023/02/17 03:28:26 Fetched 17 template(s) : [csharp dockerfile go java11 java11-vert-x node node12
node12-debian node14 node16 node17 php7 php8 python python3 python3-debian ruby] from https://github
.com/openfaas/templates.git
Folder: slack-request created.

Function created in folder: slack-request
Stack file written: slack-request.yml
pyeole@pyeole:~/functions$
```

Handler.py file is created for slack-request and slack-interactive folder.

Slack-request.yml and slack-interactive.yml files were created.
Files can be seen in github repo and the screenshots below in 2nd and third questions.

Docker login


```
permission denied
pyeole@pyeole:~/functions$ sudo docker login
[sudo] password for pyeole:
Authenticating with existing credentials...
WARNING! Your password will be stored unencrypted in /root/snap/docker/2281/.docker/config.json.
Configure a credential helper to remove this warning. See
https://docs.docker.com/engine/reference/commandline/login/#credentials-store

Login Succeeded
pyeole@pyeole:~/functions$
```

Deploying the newly created functions

$ faas-cli build -f ./slack-interactive.yml


```
                                    QEMU

#19 [stage-1 13/18] WORKDIR /home/app/function/
#19 DONE 0.0s

#20 [stage-1 14/18] COPY function/requirements.txt      .
#20 DONE 0.0s

#21 [stage-1 15/18] RUN pip install -r requirements.txt --target=/home/app/python
#21 0.600 DEPRECATION: Python 2.7 reached the end of its life on January 1st, 2020. Please upgrade y
our Python as Python 2.7 is no longer maintained. A future version of pip will drop support for Pyth
on 2.7. More details about Python 2 support in pip, can be found at https://pip.pypa.io/en/latest/de
velopment/release-process/#python-2-support
#21 0.623 WARNING: You are using pip version 20.0.2; however, version 20.3.4 is available.
#21 0.623 You should consider upgrading via the '/usr/local/bin/python -m pip install --upgrade pip'
 command.
#21 DONE 0.6s

#22 [stage-1 16/18] WORKDIR /home/app/
#22 DONE 0.0s

#23 [stage-1 17/18] COPY function          function
#23 DONE 0.0s

#24 [stage-1 18/18] RUN chown -R app:app ./ &&   chmod -R 777 /home/app/python
#24 DONE 0.2s

#25 exporting to image
#25 exporting layers 0.1s done
#25 writing image sha256:1bff0d3b817d70f7259246eee6cedbec12a091d049d1bfc5a1fb2f41ef57f8c3 done
#25 naming to docker.io/pyeolepyeole/slack-interactive:latest done
#25 DONE 0.1s
Image: pyeolepyeole/slack-interactive:latest built.
[0] < Building slack-interactive done in 16.52s.
[0] Worker done.

Total build time: 16.52s
pyeole@pyeole:~/functions$ _
```

$ faas-cli push -f ./slack-interactive.yml

```
Configure a credential helper to remove this warning. See
https://docs.docker.com/engine/reference/commandline/login/#credentials-store

Login Succeeded
pyeole@pyeole:~/functions$ sudo faas-cli push -f ./slack-interactive.yml
[0] > Pushing slack-interactive [pyeolepyeole/slack-interactive:latest]
The push refers to repository [docker.io/pyeolepyeole/slack-interactive]
d3b1905b4b8c: Pushed
eea6f4f11745: Pushed
5f70bf18a086: Pushed
ed49eb30a85a: Pushed
fadb4361fd93: Pushed
3c00fc88020c: Pushed
2e53d1270921: Pushed
78a90523b1c0: Pushed
1ff5173949bc: Pushed
90389a2595bf: Pushed
4e24a42c1dcd: Pushed
e39f1058e245: Pushed
8f1ff7cfec1e: Pushed
291a574f3a63: Pushed
e8209dbfe28c: Pushed
15714e3be781: Mounted from library/python
08ad508c310e: Mounted from library/python
ec8356a34759: Mounted from library/python
294ac687b5fc: Mounted from library/python
latest: digest: sha256:9c01487b751667fa6789a1eb5ac6da9e645006a95226b3cfb42024ca68c887eb size: 4693
[0] < Pushing slack-interactive [pyeolepyeole/slack-interactive:latest] done.
[0] Worker done.
pyeole@pyeole:~/functions$ _
```

$ faas-cli deploy -f ./slack-interactive.yml

```
15714e3be781: Mounted from library/python
08ad508c310e: Mounted from library/python
ec8356a34759: Mounted from library/python
294ac687b5fc: Mounted from library/python
latest: digest: sha256:9c01487b751667fa6789a1eb5ac6da9e645006a95226b3cfb42024ca68c887eb size: 4693
[0] < Pushing slack-interactive [pyeolepyeole/slack-interactive:latest] done.
[0] Worker done.
pyeole@pyeole:~/functions$ sudo faas-cli deploy -f ./slack-interactive.yml
Deploying: slack-interactive.

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

pyeole@pyeole:~/functions$
```

$ faas-cli build -f ./slack-request.yml

```
#18 [stage-1  9/18] RUN chown -R app /home/app &&    mkdir -p /home/app/python && chown -R app /home/
app
#18 CACHED

#19 [stage-1  2/18] COPY --from=watchdog /fwatchdog /usr/bin/fwatchdog
#19 CACHED

#20 [stage-1  4/18] RUN apk --no-cache add ca-certificates ${ADDITIONAL_PACKAGE}
#20 CACHED

#21 [stage-1 10/18] RUN pip install -r requirements.txt --target=/home/app/python
#21 CACHED

#22 [stage-1  8/18] COPY requirements.txt   .
#22 CACHED

#23 [stage-1 16/18] WORKDIR /home/app/
#23 CACHED

#24 [stage-1 17/18] COPY function           function
#24 DONE 0.0s

#25 [stage-1 18/18] RUN chown -R app:app ./ &&    chmod -R 777 /home/app/python
#25 DONE 0.2s

#26 exporting to image
#26 exporting layers 0.0s done
#26 writing image sha256:93f156dd448bc6b9cd2f8e91820aad261cedb25fd0eb8777d281e20435a2a65d done
#26 naming to docker.io/pyeolepyeole/slack-request:latest done
#26 DONE 0.0s
Image: pyeolepyeole/slack-request:latest built.
[0] < Building slack-request done in 1.33s.
[0] Worker done.

Total build time: 1.33s
pyeole@pyeole:~/functions$ _
```

$ faas-cli push -f ./slack-request.yml

```
pyeole@pyeole:~/functions$ sudo faas-cli push -f ./slack-request.yml
[0] > Pushing slack-request [pyeolepyeole/slack-request:latest]
The push refers to repository [docker.io/pyeolepyeole/slack-request]
e1f3c7ca6d01: Pushed
f7fc58c56ec6: Pushed
5f70bf18a086: Mounted from pyeolepyeole/slack-interactive
ed49eb30a85a: Mounted from pyeolepyeole/slack-interactive
fadb4361fd93: Mounted from pyeolepyeole/slack-interactive
3c00fc88020c: Mounted from pyeolepyeole/slack-interactive
2e53d1270921: Mounted from pyeolepyeole/slack-interactive
78a90523b1c0: Mounted from pyeolepyeole/slack-interactive
1ff5173949bc: Mounted from pyeolepyeole/slack-interactive
90389a2595bf: Mounted from pyeolepyeole/slack-interactive
4e24a42c1dcd: Mounted from pyeolepyeole/slack-interactive
e39f1058e245: Mounted from pyeolepyeole/slack-interactive
8f1ff7cfec1e: Mounted from pyeolepyeole/slack-interactive
291a574f3a63: Mounted from pyeolepyeole/slack-interactive
e8209dbfe28c: Mounted from pyeolepyeole/slack-interactive
15714e3be781: Mounted from pyeolepyeole/slack-interactive
08ad508c310e: Mounted from pyeolepyeole/slack-interactive
ec8356a34759: Mounted from pyeolepyeole/slack-interactive
294ac687b5fc: Mounted from pyeolepyeole/slack-interactive
latest: digest: sha256:fb0045bb433cf3f6c6f3ecebaef41e7fd71500c7268455077bf6244d44070d90 size: 4693
[0] < Pushing slack-request [pyeolepyeole/slack-request:latest] done.
[0] Worker done.
pyeole@pyeole:~/functions$ _
```

$ faas-cli deploy -f ./slack-request.yml

```
[0] Worker done.
pyeole@pyeole:~/functions$ sudo faas-cli deploy -f ./slack-request.yml
Deploying: slack-request.

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

pyeole@pyeole:~/functions$ _
```

Tasks

1) Provide a screenshot of invoking the figlet function (10 pts)

```
pyeole@pyeole:~/faasd$ echo "Hello, Faas, World" | faas-cli invoke figlet
 _   _      _ _         _____
| | | | ___| | | ___   |  ___|_ _  __ _ ___     __      __         _     _
| |_| |/ _ \ | |/ _ \  | |_ / _` |/ _` / __|    \ \ /\ / /__  _ __| | __| |
|  _  |  __/ | | (_) | |  _| (_| | (_| \__ \     \ V  V / _ \| '__| |/ _` |
|_| |_|\___|_|_|\___/  |_|  \__,_|\__,_|___/      \_/\_/\___/|_|  |_|\__,_|
               |/               |/
pyeole@pyeole:~/faasd$ _
```

2) Complete slack-request/handler.py (20 pt)

```python
1   import json
2
3   def handle(req):
4       data = {
5           "text": "Serverless Message",
6           "attachments": [{
7               "title": "The Awesome world of Cloud Computing! COEN 241",
8               "fields": [{
9                   "title": "Amazing Level",
10                  "value": "100",
11                  "short": True
12              }],
13              "author_name": "Pradnya Yeole",
14              "author_icon": "",
15              "image_url": "https://github.com/pradnyayeole.png"
16          },
17          {
18              "title": "About COEN 241",
19              "text": "COEN 241 is the most awesome class ever!."
20          },
21          {
22              "fallback": "Would you recommend COEN 241 to your friends?",
23              "title": "Would you recommend COEN 241 to your friends?",
24              "callback_id": "response123",
25              "color": "#3AA3E3",
26              "attachment_type": "default",
27              "actions": [
28                  {
29                      "name": "recommend",
30                      "text": "Of Course!",
31                      "type": "button",
32                      "value": "recommend"
33                  },
34                  {
35                      "name": "definitely",
36                      "text": "Most Definitely!",
37                      "type": "button",
38                      "value": "definitely"
39                  }
40              ]
41          }]
42      }
43      return json.dumps(data)
44
```
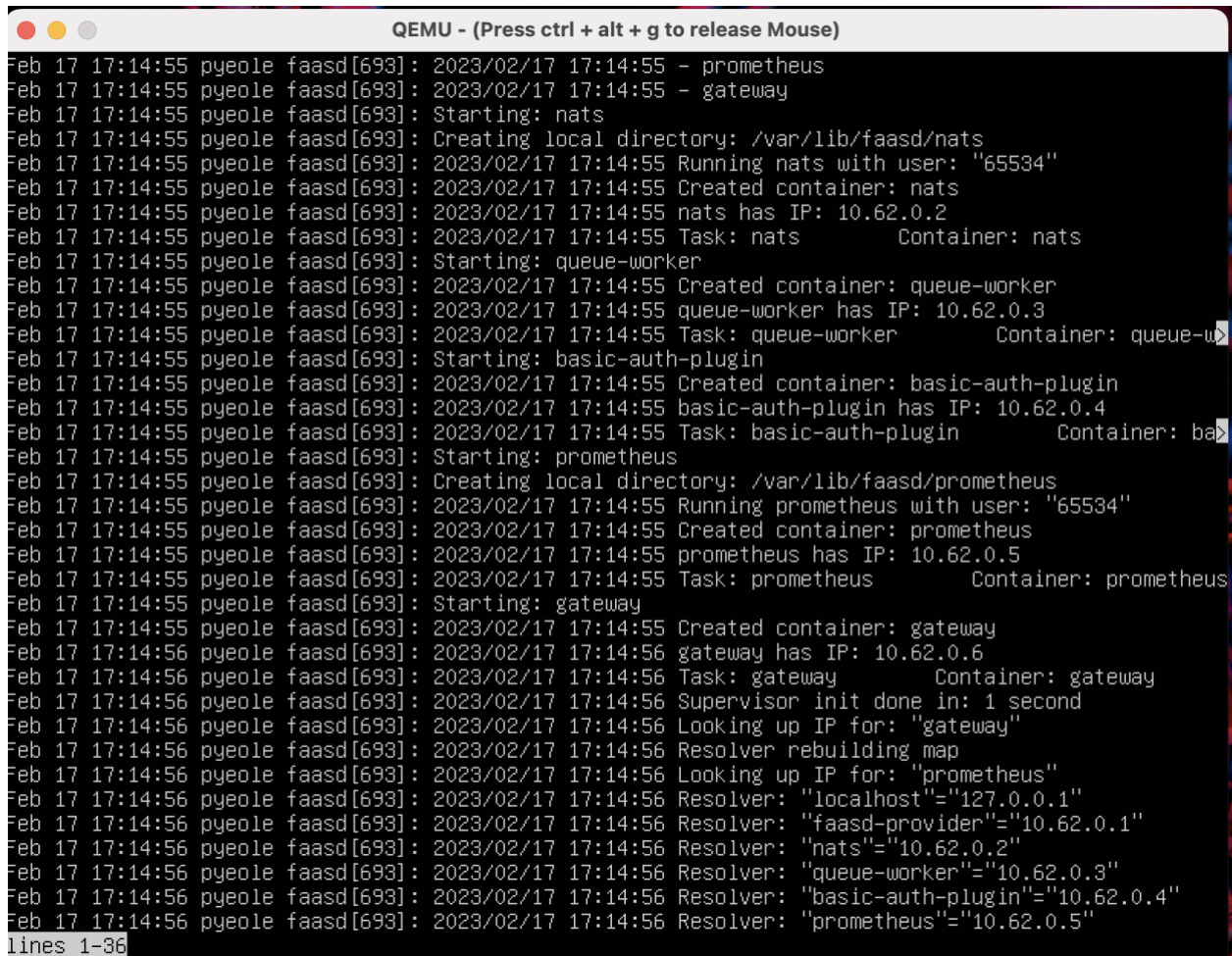
3) Complete slack-interactive/handler.py (20 pt)

```python
1    import json
2    import urllib
3
4    def handle(req):
5        urlstring = urllib.unquote(req).decode('utf8').strip('payload=')
6        response = json.loads(urlstring)
7        buttonPressed = response["actions"][0]["value"]
8        value = (buttonPressed == 'recommend' and 'Of Course was pressed') or 'Definitely was pressed!'
9
10       data = {
11           "attachments": [
12               {
13                   "replace_original": True,
14                   "response_type": "ephemeral",
15                   "fallback": "Required plain-text summary of the attachment.",
16                   "color": "#36a64f",
17                   "pretext": value+"Ahh yeah! Great choice, COEN 241 is absolutely amazing!",
18                   "author_name": "Pradnya Yeole",
19                   "author_link": "https://github.com/pradnyayeole",
20                   "author_icon": "https://github.com/pradnyayeole.png",
21                   "title": "COEN 241",
22                   "title_link": "https://www.scu.edu/engineering/academic-programs/department-of-computer-engineeri
23                   "text": "Head over to COEN 241",
24                   "image_url": "https://www.scu.edu/media/offices/umc/scu-brand-guidelines/visual-identity-amp-phot
25                   "thumb_url": "https://www.scu.edu/engineering/academic-programs/department-of-computer-engineerin
26                   "footer": "Slack Apps built on OpenFaas",
27                   "footer_icon": "https://a.slack-edge.com/45901/marketing/img/_rebrand/meta/slack_hash_256.png",
28                   "ts": 123456789
29               }
30           ]
31       }
32       return json.dumps(data)
33
```

4) Provide a screenshot of running the following command (10 pts)
   sudo journalctl -u faasd --lines 40

```
QEMU - (Press ctrl + alt + g to release Mouse)
Feb 17 17:14:55 pyeole faasd[693]: 2023/02/17 17:14:55 - prometheus
Feb 17 17:14:55 pyeole faasd[693]: 2023/02/17 17:14:55 - gateway
Feb 17 17:14:55 pyeole faasd[693]: Starting: nats
Feb 17 17:14:55 pyeole faasd[693]: Creating local directory: /var/lib/faasd/nats
Feb 17 17:14:55 pyeole faasd[693]: 2023/02/17 17:14:55 Running nats with user: "65534"
Feb 17 17:14:55 pyeole faasd[693]: 2023/02/17 17:14:55 Created container: nats
Feb 17 17:14:55 pyeole faasd[693]: 2023/02/17 17:14:55 nats has IP: 10.62.0.2
Feb 17 17:14:55 pyeole faasd[693]: 2023/02/17 17:14:55 Task: nats          Container: nats
Feb 17 17:14:55 pyeole faasd[693]: Starting: queue-worker
Feb 17 17:14:55 pyeole faasd[693]: 2023/02/17 17:14:55 Created container: queue-worker
Feb 17 17:14:55 pyeole faasd[693]: 2023/02/17 17:14:55 queue-worker has IP: 10.62.0.3
Feb 17 17:14:55 pyeole faasd[693]: 2023/02/17 17:14:55 Task: queue-worker       Container: queue-w>
Feb 17 17:14:55 pyeole faasd[693]: Starting: basic-auth-plugin
Feb 17 17:14:55 pyeole faasd[693]: 2023/02/17 17:14:55 Created container: basic-auth-plugin
Feb 17 17:14:55 pyeole faasd[693]: 2023/02/17 17:14:55 basic-auth-plugin has IP: 10.62.0.4
Feb 17 17:14:55 pyeole faasd[693]: 2023/02/17 17:14:55 Task: basic-auth-plugin       Container: ba>
Feb 17 17:14:55 pyeole faasd[693]: Starting: prometheus
Feb 17 17:14:55 pyeole faasd[693]: Creating local directory: /var/lib/faasd/prometheus
Feb 17 17:14:55 pyeole faasd[693]: 2023/02/17 17:14:55 Running prometheus with user: "65534"
Feb 17 17:14:55 pyeole faasd[693]: 2023/02/17 17:14:55 Created container: prometheus
Feb 17 17:14:55 pyeole faasd[693]: 2023/02/17 17:14:55 prometheus has IP: 10.62.0.5
Feb 17 17:14:55 pyeole faasd[693]: 2023/02/17 17:14:55 Task: prometheus       Container: prometheus
Feb 17 17:14:55 pyeole faasd[693]: Starting: gateway
Feb 17 17:14:55 pyeole faasd[693]: 2023/02/17 17:14:55 Created container: gateway
Feb 17 17:14:56 pyeole faasd[693]: 2023/02/17 17:14:56 gateway has IP: 10.62.0.6
Feb 17 17:14:56 pyeole faasd[693]: 2023/02/17 17:14:56 Task: gateway       Container: gateway
Feb 17 17:14:56 pyeole faasd[693]: 2023/02/17 17:14:56 Supervisor init done in: 1 second
Feb 17 17:14:56 pyeole faasd[693]: 2023/02/17 17:14:56 Looking up IP for: "gateway"
Feb 17 17:14:56 pyeole faasd[693]: 2023/02/17 17:14:56 Resolver rebuilding map
Feb 17 17:14:56 pyeole faasd[693]: 2023/02/17 17:14:56 Looking up IP for: "prometheus"
Feb 17 17:14:56 pyeole faasd[693]: 2023/02/17 17:14:56 Resolver: "localhost"="127.0.0.1"
Feb 17 17:14:56 pyeole faasd[693]: 2023/02/17 17:14:56 Resolver: "faasd-provider"="10.62.0.1"
Feb 17 17:14:56 pyeole faasd[693]: 2023/02/17 17:14:56 Resolver: "nats"="10.62.0.2"
Feb 17 17:14:56 pyeole faasd[693]: 2023/02/17 17:14:56 Resolver: "queue-worker"="10.62.0.3"
Feb 17 17:14:56 pyeole faasd[693]: 2023/02/17 17:14:56 Resolver: "basic-auth-plugin"="10.62.0.4"
Feb 17 17:14:56 pyeole faasd[693]: 2023/02/17 17:14:56 Resolver: "prometheus"="10.62.0.5"
lines 1-36
```

5) Provide a screenshot of your OpenFaaS gateway AFTER deploying figlet, slack-handler and slack-interactive functions (10 pts)

```
ValueError: No JSON object could be decoded
pyeole@pyeole:~/functions$ faas-cli list
Function                  Invocations      Replicas
figlet                    0                0
slack-interactive         1                1
slack-request             1                1
pyeole@pyeole:~/functions$
```
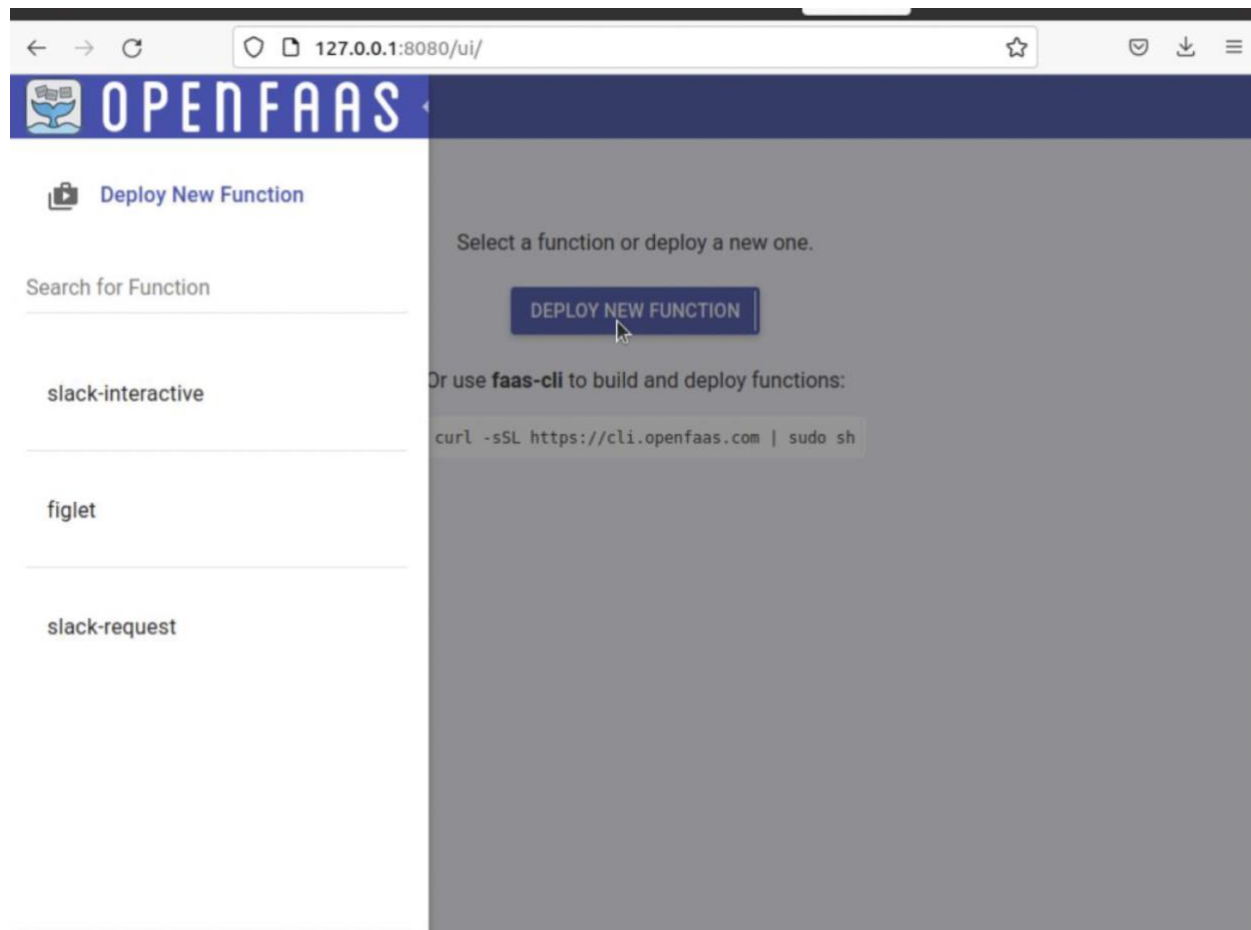
6) Provide a screenshot of invoking slack-request and slack-interactive functions (10 pts)

```
pyeole@pyeole:~/functions/slack-request$ sudo faas-cli invoke slack-request
[sudo] password for pyeole:
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/pradnyayeole.png", "author_na
me": "Pradnya Yeole", "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", "nam
e": "recommend", "value": "recommend"}, {"text": "Most Definitely!", "type": "button", "name": "defi
nitely", "value": "definitely"}], "callback_id": "response123", "fallback": "Would you recommend COE
N 241 to your friends?", "attachment_type": "default"}]}
pyeole@pyeole:~/functions/slack-request$ 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/pradnyayeole.png", "author_na
me": "Pradnya Yeole", "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", "nam
e": "recommend", "value": "recommend"}, {"text": "Most Definitely!", "type": "button", "name": "defi
nitely", "value": "definitely"}], "callback_id": "response123", "fallback": "Would you recommend COE
N 241 to your friends?", "attachment_type": "default"}]}
pyeole@pyeole:~/functions/slack-request$ _
```

```
pyeole@pyeole:~/functions/slack-interactive$ cd ..
pyeole@pyeole:~/functions$ echo '{"name":"pyeole"}' | sudo faas-cli invoke slack-interactive
{"attachments": [{"footer": "Slack Apps built on OpenFaas", "author_link": "https://github.com/pradn
yayeole", "color": "#36a64f", "text": "Head over to COEN 241", "title": "COEN 241", "ts": 123456789,
 "author_name": "Pradnya Yeole", "title_link": "https://www.scu.edu/engineering/academic-programs/de
partment-of-computer-engineering/graduate/course-descriptions/", "image_url": "https://www.scu.edu/m
edia/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 ye
ah! 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/pradnyayeole.png"}]}
pyeole@pyeole:~/functions$ curl -H "Content-Type: application/json" -X POST -d '{"name":"pyeole"} lo
calhost:8080/function/slack-interactive'
curl: no URL specified!
curl: try 'curl --help' or 'curl --manual' for more information
pyeole@pyeole:~/functions$ curl -H "Content-Type: application/json" -X POST -d '{"name":"pyeole"}' l
ocalhost:8080/function/slack-interactive'
>
> ^C
pyeole@pyeole:~/functions$ curl -H "Content-Type: application/json" -X POST -d '{"name":"pyeole"}' l
ocalhost:8080/function/slack-interactive'
> ^C
pyeole@pyeole:~/functions$ curl -H "Content-Type: application/json" -X POST -d '{"name":"pyeole"}' l
ocalhost:8080/function/slack-interactive
{"attachments": [{"footer": "Slack Apps built on OpenFaas", "author_link": "https://github.com/pradn
yayeole", "color": "#36a64f", "text": "Head over to COEN 241", "title": "COEN 241", "ts": 123456789,
 "author_name": "Pradnya Yeole", "title_link": "https://www.scu.edu/engineering/academic-programs/de
partment-of-computer-engineering/graduate/course-descriptions/", "image_url": "https://www.scu.edu/m
edia/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 ye
ah! 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/pradnyayeole.png"}]}
pyeole@pyeole:~/functions$ _
```

Questions

1. What is the command to invoke the slack-request function (4 pts)?
   a. Via Curl
   → curl localhost:8080/function/slack-request

   b. Via faas-cli
   → faas-cli invoke slack-request

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


```
pyeole@pyeole:~/functions/slack-request$ sudo faas-cli invoke slack-request
[sudo] password for pyeole:
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/pradnyayeole.png", "author_na
me": "Pradnya Yeole", "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", "nam
e": "recommend", "value": "recommend"}, {"text": "Most Definitely!", "type": "button", "name": "defi
nitely", "value": "definitely"}], "callback_id": "response123", "fallback": "Would you recommend COE
N 241 to your friends?", "attachment_type": "default"}]}
pyeole@pyeole:~/functions/slack-request$ 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/pradnyayeole.png", "author_na
me": "Pradnya Yeole", "title": "The Awesome world of Cloud Computing! COEN 241"}, {"text": "COEN 241
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241 to your friends?", "color": "#3AA3E3", "actions": [{"text": "Of Course!", "type": "button", "nam
e": "recommend", "value": "recommend"}, {"text": "Most Definitely!", "type": "button", "name": "defi
nitely", "value": "definitely"}], "callback_id": "response123", "fallback": "Would you recommend COE
N 241 to your friends?", "attachment_type": "default"}]}
pyeole@pyeole:~/functions/slack-request$ _
```

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": "pyeole"}'
   localhost:8080/function/slack-interactive

   b. Via faas-cli
   → echo '{"name" : "pyeole"}' | faas-cli invoke slack-interactive

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

```
pyeole@pyeole:~/functions/slack-interactive$ cd ..
pyeole@pyeole:~/functions$ echo '{"name":"pyeole"}' | sudo faas-cli invoke slack-interactive
{"attachments": [{"footer": "Slack Apps built on OpenFaas", "author_link": "https://github.com/pradn
yayeole", "color": "#36a64f", "text": "Head over to COEN 241", "title": "COEN 241", "ts": 123456789,
 "author_name": "Pradnya Yeole", "title_link": "https://www.scu.edu/engineering/academic-programs/de
partment-of-computer-engineering/graduate/course-descriptions/", "image_url": "https://www.scu.edu/m
edia/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 ye
ah! 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/pradnyayeole.png"}]}
pyeole@pyeole:~/functions$ curl -H "Content-Type: application/json" -X POST -d '{"name":"pyeole"} lo
calhost:8080/function/slack-interactive'
curl: no URL specified!
curl: try 'curl --help' or 'curl --manual' for more information
pyeole@pyeole:~/functions$ curl -H "Content-Type: application/json" -X POST -d '{"name":"pyeole"}' l
ocalhost:8080/function/slack-interactive'
>
> ^C
pyeole@pyeole:~/functions$ curl -H "Content-Type: application/json" -X POST -d '{"name":"pyeole"}' l
ocalhost:8080/function/slack-interactive'
> ^C
pyeole@pyeole:~/functions$ curl -H "Content-Type: application/json" -X POST -d '{"name":"pyeole"}' l
ocalhost:8080/function/slack-interactive
{"attachments": [{"footer": "Slack Apps built on OpenFaas", "author_link": "https://github.com/pradn
yayeole", "color": "#36a64f", "text": "Head over to COEN 241", "title": "COEN 241", "ts": 123456789,
 "author_name": "Pradnya Yeole", "title_link": "https://www.scu.edu/engineering/academic-programs/de
partment-of-computer-engineering/graduate/course-descriptions/", "image_url": "https://www.scu.edu/m
edia/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 ye
ah! 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/pradnyayeole.png"}]}
pyeole@pyeole:~/functions$ _
```

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

- o Additional packages required can be set here to passed Instead of yml file.
- o --lang can be used to set language and --build-arg for other additional arguments like ADDITIONAL_PACKAGE

Example:
curl -d '{"Sample": "Argument"}' http://127.0.0.1:8080/function/slack-interactive
echo "Sample Argument" | faas-cli invoke figlet

6. How would you change the slack-interactive function to react to different inputs? (4 pts)
   - Parse the request to get the payload
   - Get the action from it and the value of button pressed
   - Setting value to the button pressed based on equality condition
   - Appending value to pretext to be used in slack app