Lab 5: Catchup on Docker & More Flask

Learning Outcomes:

You should ensure you have watched the ONLINE video lectures each week before the lab starts. Labs require that you have watched the videos and are present in the lab. This week we want to ensure that you have your development environemt working and you are becoming more familiar and comfortable with GIT and Docker. Marks for this week are based on Part A, the work in the lab. Part B is required for feedback on the lab, but no marks will be assigned. ***Everyone should now have an IPV4 virtual machine in the cloud. Either Okeanos or Amazon EC2. If not, you need to tell your Tutor who can help assign a Virtual Machine with IPV4.*** ***We will discontinue using the local VM from this week.***

After completing the exercises in this lab you should be able:

- To use GITHUB and distribute your GIT repository to different machines
- More Linux shell (command line interpreter) experience
- Become more familiar with Docker
- Build, run and modify a Docker Container
- Extend the API of the flask application

Organisation

Please attempt this lab individually.

Lab Assessment - 30% of overall Module

Continous assessment is based on ongoing assesment throughout the module. There are 2 parts to this weeks assessment each of which is worth 50% of the lab assessment mark. Personal circumstances will be considered on a case by case basis with supporting evidence.

- ✓ Part A. – Assessed by the **Tutor Demonstrator** before you leave the lab. Marks are allocated for completion of parts, but you must provide evidence of completion where feasible. (***Grading is between 0-100***). You must review your lab progress with the Tutor Demonstrator before you leave the lab. Failure to do so may result in a score of 0. **If you didn't complete last weeks lab, there are extra marks this week to follow the walkthough provided because you need to have Docker working to do this weeks lab.**

- ✓ Part B. – Assessed by the **Lecturer** before the next lab. you must upload your report in webcourses before the end of the day. Late reports not graded. If you have not attended then report also not graded. (Grading is between 0-0).

Part A – In Lab Assessment

1. Catch up (25 Marks) for those who scored less than 70% last week

I. Ensure you have watched the lecture videos for this week. Distributed Computing & Webservers and REST APIs.

II. Watch the **Video Walkthrough** for Lab4 and complete it if you have not done so last week. If you completed the lab fully last week then move on to the next section.

a. Docker installed, **(10 Marks)**

b. Container running **(5 Marks)**

c. Hello World working on port 5000 **(5 Marks)**

d. Lab4 GITHUB repository up to date with server.py and Dockerfile **(5 Marks)**

2. Docker & REST (100 Marks)

I. Review the quick start documentation on flask, which is the application we ran inside our Docker container last week. http://flask.pocoo.org/docs/0.10/quickstart/#

II. Use your lab4 repo and create a new subdirectory called lab5 similar to below.

a. Mylab4-repo/lab5/ (**10 Marks**)

III. Copy the Dockerfile and my_application/ directory from lab 4 to the lab 5 subdirectory so it looks like the following. (**10 Marks**)

b. Mylab4-repo/lab5/Dockerfile

c. Mylab4-repo/lab5/my_application

IV. Modify the flask server.py file so that it will listen on port 8080 instead of port 5000, and turn on the debug mode. (**10 Marks**)

hint: app.run(host='0.0.0.0', port=5000,debug=True)

V. Test it by building a new image and running a container and using the following command where you find the IPAddres of the running container. **(10 Marks)**

$**curl http://ipaddress:80**

VI. Read http://flask.pocoo.org/docs/0.10/quickstart/# and then modify the server.py application to support the following (Insert your own Container IP address)

$curl http://172.17.0.32:8080

Index File **(10 Marks)**

$curl http://172.17.0.32:8080/hello

Hello World **(10 Marks)**

$curl http://172.17.0.32:8080/user/paul

User paul **(10 Marks)**

curl http://172.17.0.32:8080/post/80

Post 80 **(10 Marks)**

VII. Modify the flask server.py file so that it will listen on default port 5000 again, and turn on the debug mode.

hint: app.run(host='0.0.0.0', debug=True)

Try to connect from a browser on your local machine to the defined endpoints.

http://VMDNSNAME/

Explain what happens. **(10 Marks)**

VIII. Stop any running containers and re-run lab5 using the following command

```
docker run –p 8080:5000 lab5
```

Try to connect from a browser on your local machine to the defined endpoints.

http://VMDNSNAME/

Explain what happens. If this succeeds then try the other endpoints from part IV above

(10 Marks)

Note: Use `docker rmi –f lab5` to delete image called **lab5**

Part B – Webcourses Report

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1. Submit your Webcourses Weekly Report (0 Marks)

The lab report should contain the 4 sections as below this week.

1. Explain any areas of difficulty in this week's lab (100 words or less)
2. Explain what went well in this week's lab (100 words or less)
3. Provide a link to your GITHUB Repo
4. Any other comments?