M7024E Laboratory 4: Programming Cloud Services - RESTful APIs

Welcome to the fourth laboratory of the M7024E: Cloud Services course. In this laboratory exercise, you will explore the microservices architecture and program a RESTful Web service.

1 Objectives

The objective of this lab is to:

- Understand methodologies for developing Cloud application and services.
- Program a simple RESTful API.

2 Questions

Question 1: What are microservices? Describe in detail the pros and cons of microservices architecture by giving examples.

3 Exercises

Exercise a: In this exercise, you will learn how to develop a simple RESTful API for the application of your choice.

1. Think about an application, for example, an online record keeping application; or an online Cloud monitoring service such as CloudHarmony; or a music service such as last.fm that keep tracks of users music taste profile. Select a service that you wish to create on similar lines.
2. Use Docker container to deply your service. Use Dockerfile to build your image.
3. Use microservices as an architectural paradigm to *design a simple service(s).* Describe and document that service.
4. Create a RESTful API to implement your service. Your RESTful API should implement *atleast two verbs*, for example GET and POST. For GET, you should implement atleast one path,

   For example {id} in http://localhost/MyApp/students/{id}.

(a) You are free to choose any framework, however, use of Jeresy[1], Maven, and Apache Glassfish is recommended. For Python, the use of Django REST framework [2] is recommended.

(b) You will pass the lab if you answer question 1 and implement exercise 4(a), additional credits will be awarded if you interface your API with a database of your choice and explain the choice of your database.

[1] https://eclipse-ee4j.github.io/jersey/. Accessed: 29 Nov. 2022.
[2] https://www.django-rest-framework.org/#example. Accessed: 29 Nov. 2022.