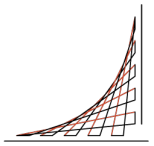


Laboratory 4

Application server architectures, object meta protocols, IoC pattern and reflection

Author: Angi Paola Jimenez Pira
Teacher: Luis Daniel Benavides Navarro

Date: Friday 26th February, 2021
Bogota, Colombia

1 Introduction

The purpose of this project is to develop a framework to create web applications, developing features similar to functionalities offers by Spring Boot Framework.

In this document you will find the explanation of challenges purposed in the laboratory 4, the architecture implemented, the tools used during development of this project and other sections that are important to understand how the project works (how run it, how test it, etc.) and if you want extend the code and implement new functionalities.

2 Objectives

- To develop a framework based in Spring Boot to create web applications.
- To learn a part of Spring Boot architecture.
- To learn to deploy a web app in Heroku.
- To use known tools like Circleci, Maven, Java, Git and GitHub to develop a web app.

3 Glossary

- **Spring Boot:** Spring Boot is an open source Java-based framework used to create a micro Service and different web applications.
- **Apache Maven:** Is a build automation tool used primarily for Java projects. Maven can also be used to build and manage projects written in C, Ruby, Scala, and other languages.
- **Java:** Is a general-purpose, class-based, object-oriented programming language designed for having lesser implementation dependencies. It is a computing platform for application development.
- **Circleci:** CircleCI is a modern continuous integration and continuous delivery (CI/CD) platform.
- **Heroku:** Heroku is a cloud platform that lets companies build, deliver, monitor and scale apps.
- **Git:** Git is an open-source version control system that was started by Linus Torvalds—the same person who created Linux.
- **Github:** GitHub is a code hosting platform for version control and collaboration. It lets you and others work together on projects from anywhere.

4 Challenge description

For this workshop, students must build a Web server (Apache type) in Java. The server must be able to deliver html pages and PNG images. Likewise, the server must provide an IoC framework for the construction of web applications from POJOS. Using the server, a sample web application must be built and deployed on Heroku. The server must serve multiple non-concurrent requests.

For this workshop, develop a minimal prototype that demonstrates reflective JAVA capabilities and allows at least one bean (POJO) to be loaded and a Web application derived from it. You must turn in your work at the end of the lab.

SUGGESTION

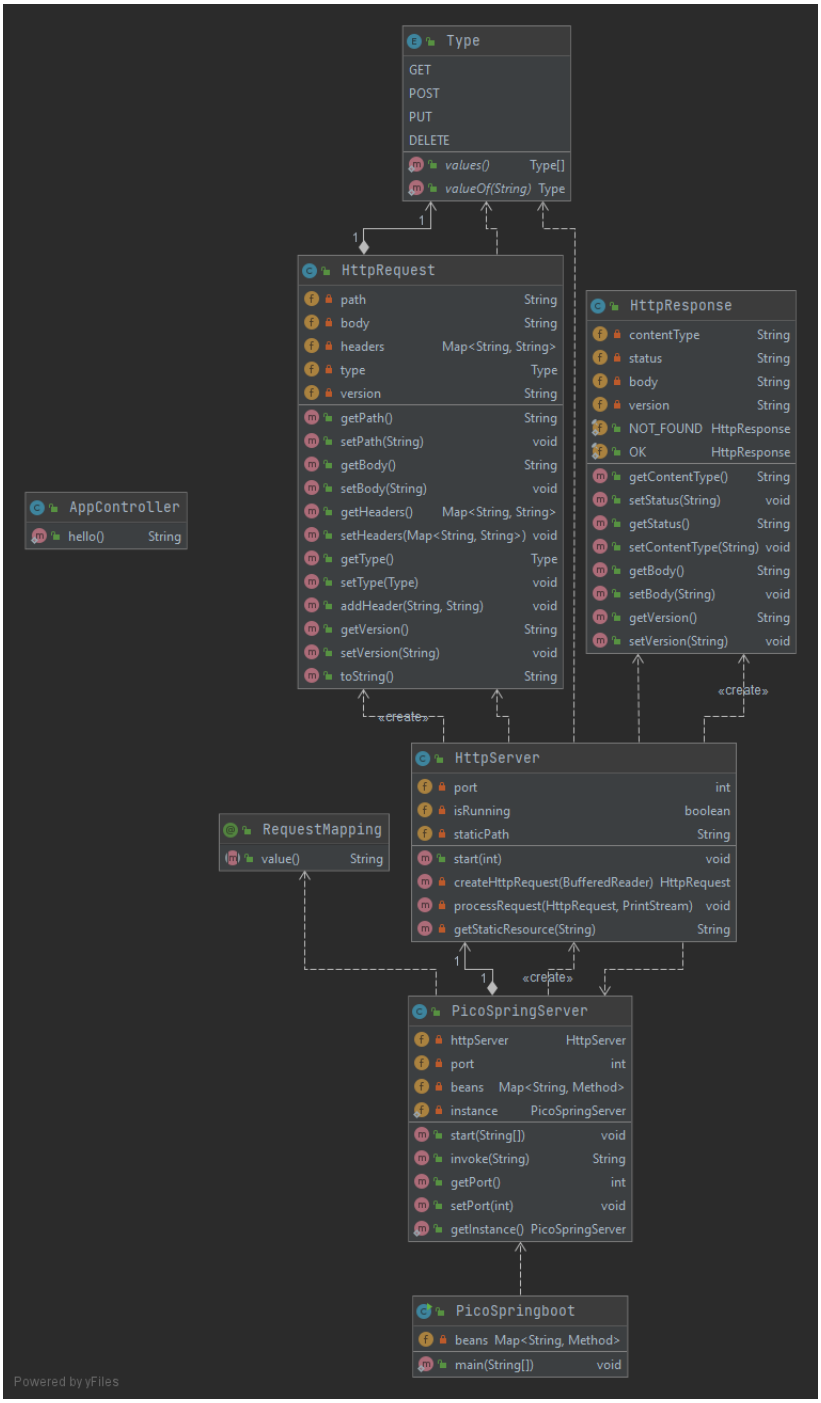
Load the POJO from the command line, similar to the TEST framework. That is, pass it as a parameter when you invoke the framework.

Serve the @ResuestMapping annotation by publishing the service at the indicated url, limit it to String return types

5 Architecture of program

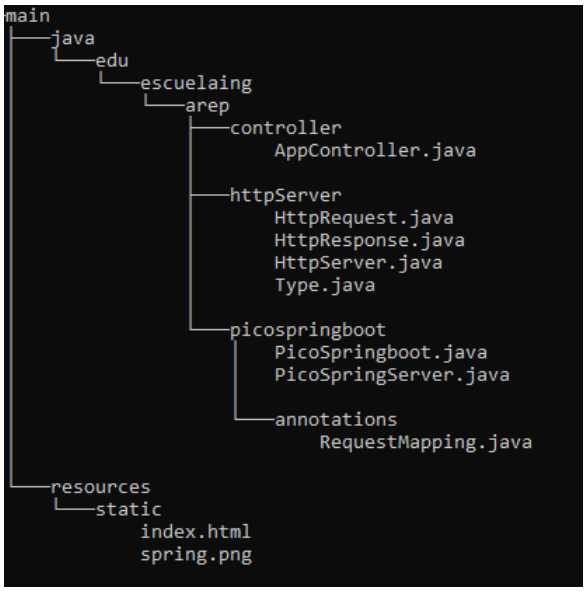
5.1 Class Diagram

The next image shows the class Diagram of the solution implemented:



5.2 Project Tree

The next image shows the structure of the project generated by the Maven dependency manager, with the objective of giving more information for the reader about how the solution was implemented:



5.3 Technology Stack

- **Development environment:** Java Development Kit 11, IntelliJ IDEA
- **Dependency Manager:** Maven
- **Version Control:** Git, Github
- **Tests:** JUnit4
- **Deploy and build:** Heroku, Circleci

5.4 Documentation

The documentation and instructions for use are in a git repository: https://github.com/angipaola10/AREP-LAB4.

6 Conclusions

- The use of tools like Circleci and Heroku to build and deploy a web app is very important because this tools help us to check the code and test developed in the program. Also, with this tools we can found bugs, duplicated code and other factors that make our project less efficient.
- We implement Spring Boot to facilitate the development of web applications. When we use this framework don't know all architecture, this homework allow us learn about the structure that build the diffent functionalities and this allows us to use the framework in a better way.

References

[1] Spring. https://spring.io/projects/spring-boot

[2] Wikipedia. https://en.wikipedia.org/wiki/Apache$_M aven$.

[3] Circleci. https://circleci.com/docs/enterprise/overview/

[4] Heroku. https://www.heroku.com/what