Distributed Programming Systems

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Installation Notes

This document overviews the software that is required or suggested to be installed in your personal computer, if you prefer using your machine instead of the PCs of LABINF.

1. Visual Studio Code

Visual Studio Code is a code editor redefined and optimized for building and debugging modern web and cloud applications. In this course, it will be used to develop applications in JavaScript (e.g., in the first laboratory activity, you will be required to develop a server exposing RESTful APIs with a node.js module called Express).

You can download the latest stable version of Visual Studio Code, according to the Operating System of your machine and according to the endianness, at the following link: https://code.visualstudio.com/Download

2. Eclipse IDE for Enterprise Java Developers

Eclipse IDE for Enterprise Java Developers is an integrated, rich environment for the development of Java-based application. In this course, it will be used to develop applications such as a gRPC server in the second laboratory activity.

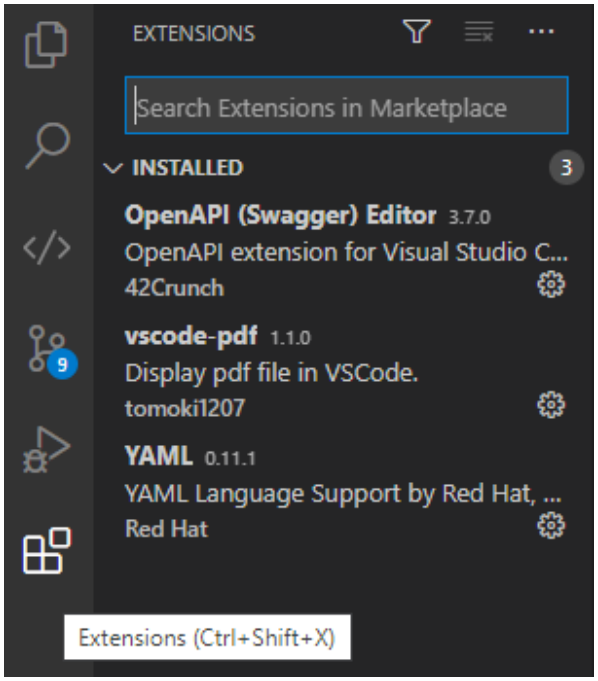
You can download the latest stable version of Eclipse IDE for Enterprise Java Developers, according to the Operating System of your machine and according to the endianness, at the following link:
https://www.eclipse.org/downloads/packages/

3. OpenAPI (Swagger) Editor

Visual Studio Code is integrated with a Marketplace, from which you can download some extensions to enrich the development environment. A suggested extension is OpenAPI (Swagger) Editor, which allows to design RESTful APIs in an efficient way (e.g.,

it offers features such as hints for auto-completion and detection of errors in the syntax).

To install this extension, you can access the Marketplace in Visual Studio Code by clicking on the bottom icon of the left bar of the IDE, as shown in the following screenshot:



4. Swagger Editor

OpenAPI (Swagger) Editor, integrated within Visual Studio Code, offers most of the features you will need for the design of the RESTful APIs. However, a missing feature is the automatic generation of a server stub from the design of the APIs; this feature will be required for developing the solution to the first laboratory activity of this course.

For the automatic generation of a server stub, you will need to download the offline version of Swagger Editor, the original software from which the Visual Studio Code extension is derived. To use this software you can download the latest release from the link: https://github.com/swagger-api/swagger-editor/archive/refs/tags/v4.14.7.zip. Once the source code has been downloaded, it is sufficient to double-click the index.html file to execute Swagger Editor in your browser.

An alternative solution is to generate the code interacting with the Swagger Codegen CLI jar module. Notice that this option requires the installation of a valid Java binary on you system. The link is: https://repo1.maven.org/maven2/io/swagger/codegen/v3/swagger-codegen-cli/3.0.72/swagger-codegen-cli-3.0.72.jar. Once downloaded, the stub can be generated with: "*java -jar swagger-codegen-cli-3.0.72.jar generate -i openapi.json -g nodejs-server -o output-folder/* "

Note: When extracting the compressed archive containing the generated server stub, the default Windows decompression tool may display security warnings and block the operation. To avoid these issues, consider using alternative archiving tools such as WinRar or 7-Zip. Alternatively, generating the stub directly using the Swagger Codegen CLI jar does not typically cause these problems.

5. Postman

Postman is a useful tool to test web services exposing RESTful APIs during their development. It allows to send any type of request, to save a collection of requests to send every time you modify the code of your server to perform regression tests, and to view the status code, response time, and response size. Postman's automatic language detection, link and syntax highlighting, search, and text formatting make it easy to inspect the response body.

You can use Postman in two alternative ways:

1) you can access the on-line version (https://go.postman.co/build), without the need of installing any additional software in your machine;
2) you can download and install an off-line version at the following link: https://www.postman.com/downloads/.

6. DB Browser for SQLite

Operations on databases (e.g., creation of a table, manual insertion/removal/update of a record in a table) can be managed with many alternative software tools. A program which is suggested for database management is DB Browser for SQLite (DB4S), a high quality, visual, open-source tool to create, design, and edit database files compatible with SQLite. Controls and wizards are available in the GUI of this software to ensure

higher user-friendliness in database management. Besides, this tool does not require familiarity with SQL commands.

You can download the latest stable version of DB Browser for SQLite, according to the Operating System of your machine and according to the endianness, at the following link: https://sqlitebrowser.org/dl/

7. Eclipse Mosquitto

Eclipse Mosquitto is an open source (EPL/EDL licensed) message broker that implements the MQTT protocol versions 5.0, 3.1.1 and 3.1. Mosquitto is lightweight and is suitable for use on all devices from low power single board computers to full servers. The MQTT protocol provides a lightweight method of carrying out messaging using a publish/subscribe model. This makes it suitable for Internet of Things messaging such as with low power sensors or mobile devices such as phones, embedded computers, or microcontrollers. This tool will be useful for the development of the solution of the fourth laboratory activity, based on the MQTT protocol.

You can find information about downloading Eclipse Mosquitto, according to the Operating System of your machine and according to the endianness, at the following link:
https://mosquitto.org/download/