Programming for IoT applications

Lab 2

SUGGESTION: Use **Postman**, a chrome plugin for testing REST web services by managing HTTP requests

Exercise 1. Extend *Exercise_1* proposed during the *Lab 1*, for designing a RESTful-style calculator.

Develop the **HTTP GET** method to manage the following commands:

- add: to add two operands and send in the HTTP body the JSON;
- **sub**: to subtract two operands and send in the *HTTP body* the JSON;
- **mul**: to multiply two operands and send in the *HTTP body* the JSON;
- **div**: to divide two operands and send in the *HTTP body* the JSON. CHECK that the operation is possible, if not an exception must be raised with the suitable HTTP code;

Manage possible errors in invoking the web services (e.g. wrong command or wrong number of parameters).

The output should be a JSON reporting both input operands, the executed command and the result (validate with http://jsonlint.com/)

Example:

- http://localhost:8080/add?op1=10&op2=12
 where add is the command and the parameters op1 and op2 provide the input operands
- http://localhost:8080/sub?op1=10&op2=9 where sub is the command and the parameters op1 and op2 provide the input operands
- Exercise 2. *Exercise_1 follow-up:* redesign RESTful-style calculator for exposing full URL fashion web services where parameters must be provided slash-separated.

Example:

- http://localhost:8080/add/10/12/
- http://localhost:8080/ **sub** /10/9/
- Exercise 3. Extend *Exercise_2* proposed during the *Lab 1*, for designing a RESTful-style calculator

Develop the HTTP PUT method for receiving in the body-message the following JSON:

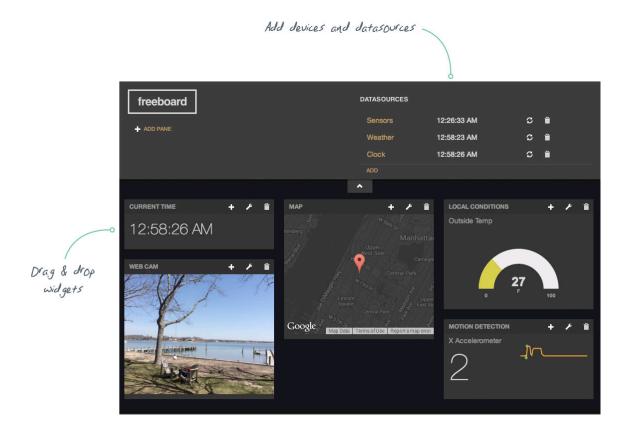
```
{
    "command": "add",
    "operands": [10, 9, 8, 7, 6, 5, 3, 2, 1]
}
```

where "command" indicates the operation to be performed among: add, sub, div, mul. "operands" is an array with the inputs for the operation.

Finally, the **PUT** method should return a JSON reporting the input operands, the executed command and the result (validate with http://jsonlint.com/)

Exercise 4. Develop REST web services for deploying freeboard¹ (use the version provided as additional material) with cherrypy.

Develop the **HTTP GET** method for providing the index.html Develop the **HTTP POST** for saving the new dashboard configuration (the resulting *dashboard.json* file must be saved in the *"freeboard/dashboard"* folder)



¹ Freeboard (http://freeboard.io/) is an open source software useful for building real-time, interactive dashboards and visualizations in minutes using the intuitive drag & drop interface.