Programming for IoT Applications

Exam Simulation

6 question multiple choice (1 point correct, 0 not given -0.5 wrong), 1 open question (max 2 points), 1 programming question (max 4 points). In order to pass you need to reach 4 point in the theory part and 3 in the programming exercise.

Surname	Name	studentID	CCL

MULTIPLE CHOICE (1 point correct, 0 not given -0.5 wrong)

[1] What is a Web-resource?
- It is any information that is not stored on a computer system
- It is any information having a unique address over the internet
- It is only the output of an algorithm
- It is any information that can be only a document or an image

[2] What is a JSON?
- It is a data exchange format
- It is a scripting language
- It is a markup language
- It is a communication protocol

[3] Thingspeak is
- Infrastructure as a Service (IaaS)
- Platform as a Service (PaaS)
- Sofware as a Service (SaaS)

[4] Which is the CORRECT MQTT topic?
- /IoTApp/#/test/#/temperature/+
- \IoTApp\+\test\+\temperature\#
- /IoTApp/+/test/+/temperature/#
- \IoTApp\#\test\#\temperature\+

[5] What is the main difference between GET and POST methods?
- Both can submit data but GET allows larger quantities of data
- GET requests data from a specified resource while POST submits data to be processed to a specified resource
- POST requests data from a specified resource while GET submits data to be processed to a specified resource
- Both can submit data but POST allows larger quantities of data

[6] What is the relationship between microservices and containers?
- Container are used to deploy microservices
- Containers are a collection of microservices
- Containers are used to develop microservices

OPEN QUESTION (max 2 points)

Briefly list the main entities that are involved in an MQTT communication and describe the operation that MQTT clients must follow in order to send and receive messages, respectively

CODING QUESTION (max 4 points)

Develop a RESTful-style program in cherrypy capable of storing and retrieving the votes for the driver of the day of a Formula1 race. The program should use the proper HTTP method to obtain from the users a vote for one driver and retrieve the most voted driver.

For example the user could send a request with the following data and data-format:

```
{
   “vote”:["Verstappen"]
}
```

When the program receives a vote like the one above it should increment the corresponding number of votes for the corresponding driver.

The file containing the sum of the previous vote is saved locally on the server as ‘driverOfDay.json'. So following the example this file could look like this:

```
{
   "drivers":[
         {"name": "Verstappen",
         "votes": 20
         },
         {"name": "Perez",
         "votes": 1
         },
         {"name": "Hamilton",
         "votes": 2
         }
         ...
]}
```

and after receiving the vote in the example it would become:

```
{
   "drivers":[
         {"name": "Verstappen",
         "votes": 21
         },
         {"name": "Perez",
         "votes": 1
         },
         {"name": "Hamilton",
         "votes": 2
         }
         ...
]}
```

The updated content MUST be returned as a response.

On the other hand, the application must expose a REST web service to retrieve the most voted driver and the percentage of votes obtained.

Choose the most suitable HTTP methods among GET/POST/PUT/DELETE. Report also the URL format you choose to support these requests. The solution must use Object Oriented Programming.