

## **Workshop on NoSQL Databases and Raspberry Pi (Percentage of Final Grades: 15%)**

You have been hired to implement the automation and IoT tasks of a small department in a building. For this purpose, you will use Firebase and the following inputs and outputs physical and in the database:

- Light bulb for the living room: this output will power on a led when a key/value in the database is modified to 1. It will be powered off when the value is 0.
- Light bulb for the kitchen: this output will power on a led when a key/value in the database is modified to 1. It will be powered off when the value is 0.
- Light bulb for the bathroom: this output will power on a led when a key/value in the database is modified to 1. It will be powered off when the value is 0.
- Light bulb for the bedroom: this output will power on a led when a key/value in the database is modified to 1. It will be powered off when the value is 0.
- Main door sensor: A digital sensor is installed in a door to check if it is open or closed. When the sensor changes its state, you have to create a new key with the timestamp and the state, that is, open or closed.
- Alarm activated/deactivated: You will setup a key in the database that indicates if an alarm system is activated or no. In the case it is activated, anytime the main door is opened, you have to upload an alarm to the database indicating the date and time of the alarm.
- Alarm: this output will be powered on if the corresponding key in the database is activated and if the main door sensor indicates that the door is opened.

You have to code a Python-based software including the directions above.

The grading rubrics will be as follows:

- Automation of light bulbs (50%).
- Alarm system including the reports in the database and the corresponding led (30%).
- Main door sensor using events and the report in the database (20%)

This assignment will be graded on May 28<sup>th</sup> during class time. No prorogations allowed.