CS458: Internet of Things
Fall 2020
Mid-Semester Examination| Practical
October 22-24,2020

ID: _____

Create a smart object to monitor sensor values and actuator statuses from a location. E.g. the temperature, humidity, light intensity, distance from the surface of a liquid, soil moisture, etc. in a location. Do the following for the sensing and actuation:

- Capture data from two sensors. Take the average of 3 readings for each sensor before sending to a database.
    - **Sensor 1:** This should capture data after every three seconds. Set a desired threshold for this sensor and control an LED (either OFF or ON) when your average reading is exceeding. **(**+ Code = **10 points)**
    - **Senser 2:** This should capture data after every five seconds. Set a desired threshold for this sensor also and control a Buzzer (either OFF or ON) when your average reading is exceeding. **(**+ Code = **10 points)**

Design a database schema to store the data. The data stored **MUST** include the following (or you could add more fields or tables):

- Current date (based on the 'server' clock)
- Time (in millis) when the sample was taken. Consider using the millis() function of the microcontroller
- The location of the sensor/actuator
- Your name
- The sensor/actuator type
- Time when the sample was recorded in the database. (Use the timestamp feature in MySQL)
- The average of 3 readings taken

Create the appropriate database and supporting server-side scripts to accomplish this. Create an HTML page to display the sensor values or actuator status. Submit the following to canvas:

- database schema **(10 points)**
- server-side scripts **(10 points)**
- MCU code **(Points for Sensor 1 & 2)**
- Photo of your smart object (the circuit & connections etc) **(5 points)**
- A 1min demo video of the final system. **(5 points)**

Note: This is an individual project. Plagiarism will be severely penalized. Respect for the Ashesi Honour Code cannot be over-emphasized.

Hard Deadline: 24-Oct-2020 **@ 10:00 am**