# INF 551 – Spring 2019
# Project Guidelines
# Theme: Using a Cloud Database to Manage IoT Devices

In this project, you are asked to develop a system that manages a set of IoT devices through a cloud database. You can choose a specific IoT theme for your project. Examples are smart home, smart city, and smart health. For instance, smart home connects lighting, water heater, AC, refrigerator, and other home appliances to the Internet. It allows users to monitor & control the devices, e.g., turning on/dimming lights, adjusting temperate of AC or heater, and asking your entertainment center to play a song.

A key component in the smart home is a cloud database that manages the data of devices. The data may include the state of devices (on or off) and the current control setting or readings from sensors. The database may also keep a log of the data from the devices (e.g., past temperature readings with timestamps or past changes of states of devices).

## Requirements:

- The database must be in the cloud (i.e., not the local one running in your laptop for example).
- It should manage at least three different smart devices/components in your specific IoT setting.
- You need to develop a Web-based/mobile (Android or iOS app) control panel that displays and controls the current state of devices. It should also display the statistics of device data (e.g., range and average of temperatures). The panel should provide an integrated view of all managed devices.
- For each device, develop a user interface that allows users to input its data to the cloud database, receive the command from the control panel, and show the current state of the device. The program can be written in any language, Web-based or mobile.

## Phases:

The project consists of 3 phases: proposal, midterm report, final report & demo. The total point of the project is 100, broken down as follows.

- Proposal: 10 points
- Midterm report: 10 points
- Final report: 20 points
- Demo: 10 points
- Project implementation: 50 points

## Proposal (1-2 pages):

Your proposal should include the following content. Please also prepare 3-5 slides for a short presentation (3 minutes) of your project idea.

- Specific IoT theme and components/devices you choose.
- A diagram showing the planned architecture of the system, design of each component, and how the components interact.
- Include details on what you plan to show in the control panel and device UI, what data you plan to collect from devices, and what commands can be sent to the devices.
- Group formation: who are in your group? What is each person's responsibility? Is your group equipped to implement the application by the end of the semester?
- Milestones: a project timeline with milestones.

## Midterm progress report (1-2 pages):

- Provide a checklist showing the items in your timeline and the status on each time (complete, on-going, etc.).
- Provide a screenshot of the components you have completed.
- Are you on track to achieve your milestones?
- Any challenges you have encountered? Any helps that you will need?
- Any other things you think should be reported in the midterm?

## Final report (5-10 pages):

It should be a comprehensive report. You may include the contents from your proposal and midterm report, with changes to reflect the final implementation of your project. The final report should have the following parts.

- Project idea.
- Screenshot for each working component with a description.
- Implementation details.
- Responsibility and work of each group member.

## Final Demo:

- Demo of your app (10-minute) will be in the last week.
- Show the working of each component of your system.
- All group members should be present at the presentations.

## Deliverables:

Your phase & final reports and project codes.