HO CHI MINH CITY, UNIVERSITY OF TECHNOLOGY
DEPARTMENT OF COMPUTER SCIENCE AND ENGINEER

Application Based Internet of Things Report

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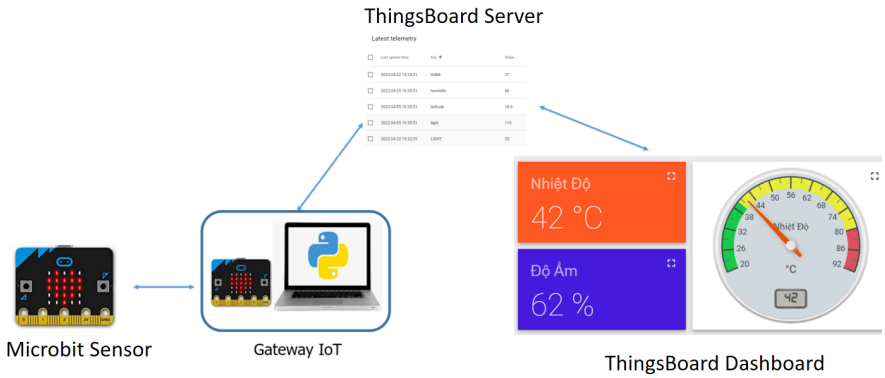
HỒ CHÍ MINH CITY

Content

1 Introduction

In this lab, students are supposed to deploy a wireless sensor network for an IoT application. A microbit board is used to play the roles of a sensor node (reads sensory data and receives commands from the gateway). The second microbit is connected to the Python source code to support wireless communications with the sensor node. The block architecture of the system is presented bellow.



Hình 1: *Structure of the wireless sensor network*

Following the architecture, the main microbit (connected to the gateway python) is just an adapter, to forward commands from python to sensor nodes and sensory data from sensors, to the python gateway.

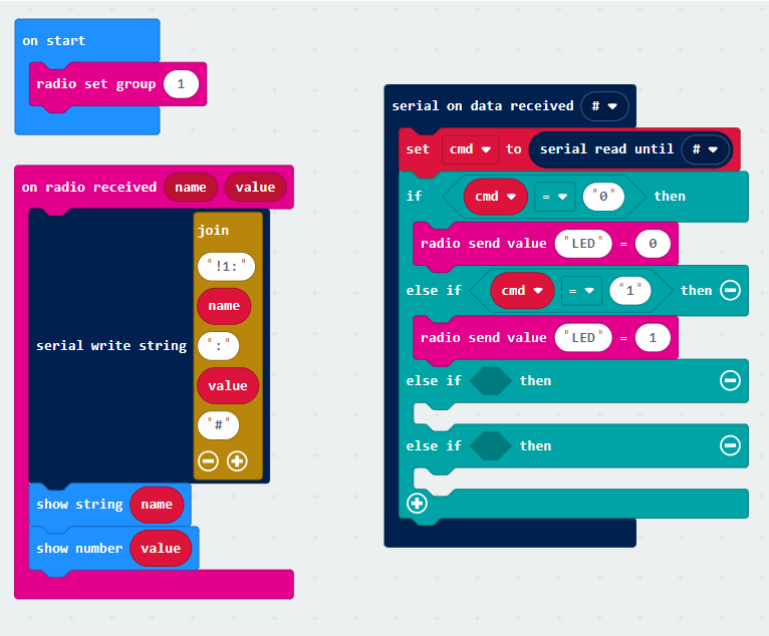
2 Implementation

2.1 Main Microbit

The main microbit now is an data adapter, having 2 connection:

- Serial: Receive commands from python and send sensory data to python
- Radio: Send command to sensor nodes and receive sensory data.

In order to use the Radio, the group of microbits must be the same. The block **radio send value** is recommended in this lab. A propose to implement the source code is depicted as follows:



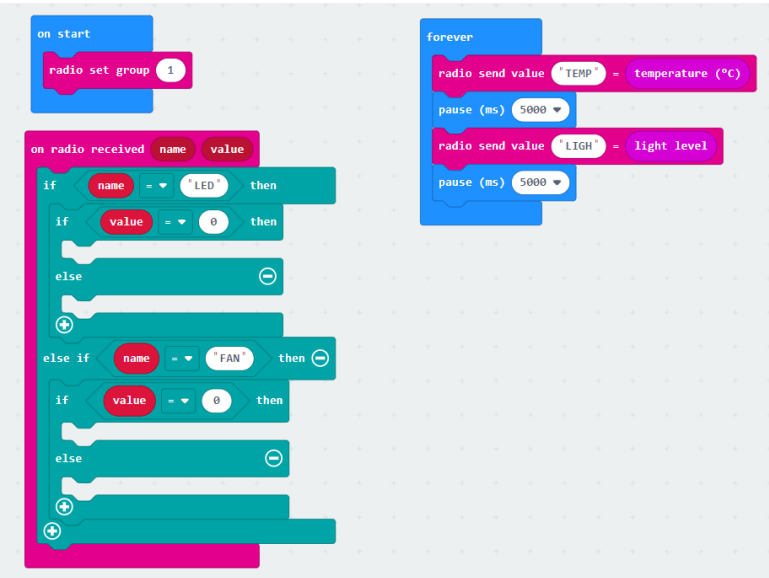
Hình 2: *Main Microbit Program*

The link for this source code is public following:

`https://makecode.microbit.org/_iguEFf83AHJH`

2.2 Sensor Microbit

The sensor code is now, move to the second Microbit. The implementation is similar to LAB 3. However, the communication is wirelessly by Radio. The proposed source code for this part is presented as follow.



Hình 3: *Sensor Microbit Program*

The link for this source code is public bellow:

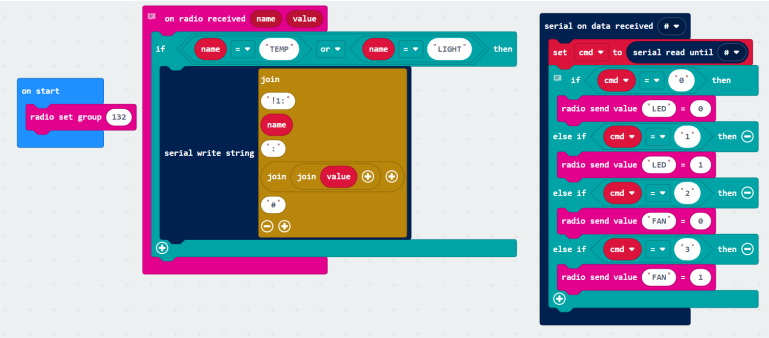
https://makecode.microbit.org/_T7s75m337h7L

3 Report

3.1 Main Microbit Program

Report : The picture of your source code is required to present here in this report. A sharable link from MakeCode is also required to present here. To finilize your program, at least 4 commands are supported (for 2 buttons on the dashboard).

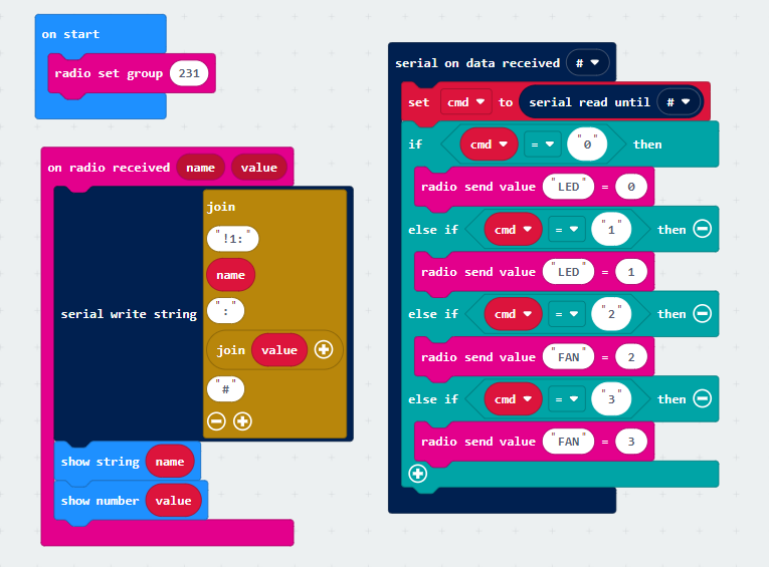
Đặng Quốc Thắng:



Hình 4: *Main Microbit Program - Thắng*

Link MakeCode: https://makecode.microbit.org/_UkPM0eFFyg6d

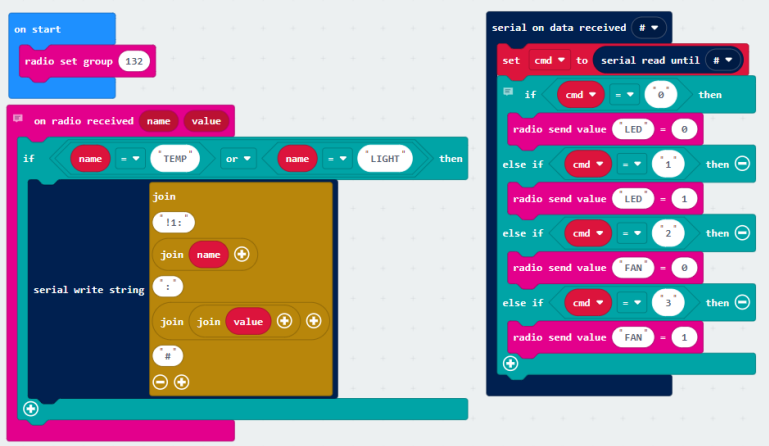
Nguyễn Công Thành:



Hình 5: *Main Microbit Program - Thành*

Link MakeCode: https://makecode.microbit.org/_dPi10pMVTAig

Tạ Quang Việt:



Hình 6: *Main Microbit Program - Việt*

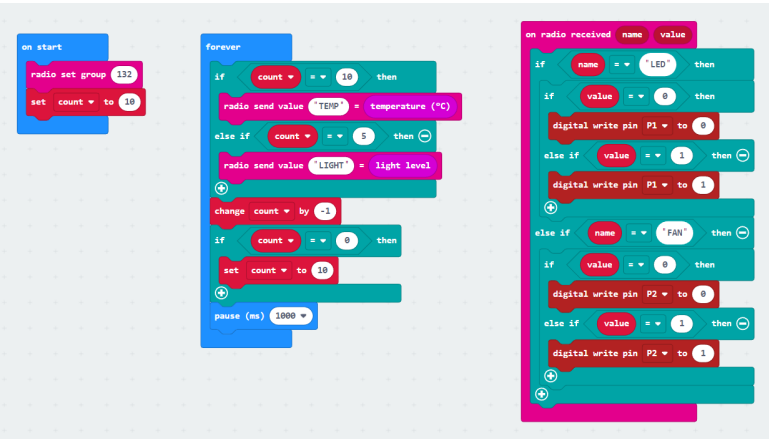
Link MakeCode: `https://makecode.microbit.org/_CRtL6aa31arV`

3.2 Sensor Microbit Program

Report : The picture of your source code is required to present here in this report. A sharable link from MakeCode is also required to present here.

To finilize your program, at least 4 commands are received and process in the block **on radio received name value** (for 2 buttons on the dashboard).

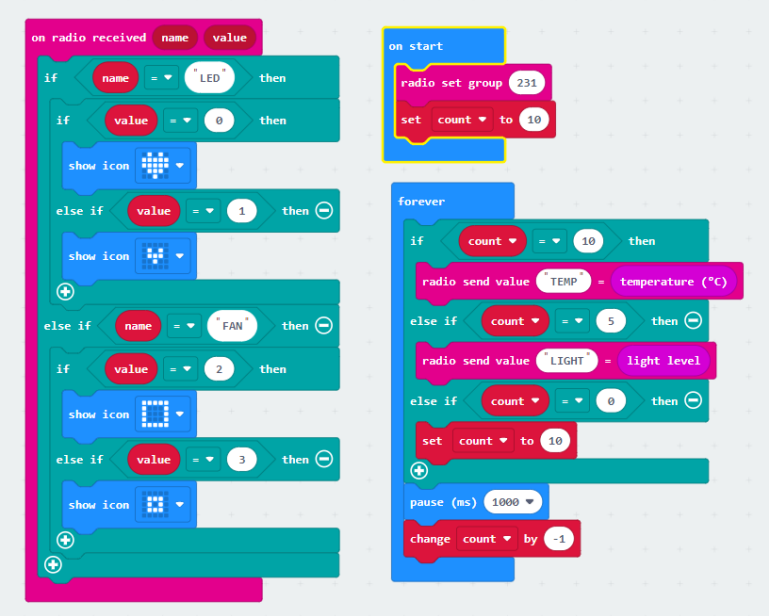
Đặng Quốc Thắng:



Hình 7: *Sensor Microbit Program - Thắng*

Link MakeCode: `https://makecode.microbit.org/_2TEgy3FE9Vq3`.

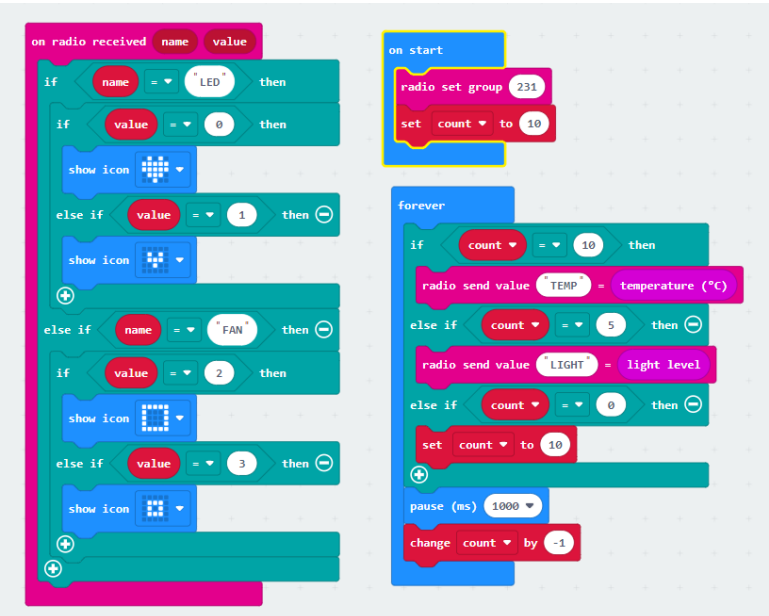
Nguyễn Công Thành:



Hình 8: *Sensor Microbit Program - Thành*

Link MakeCode: `https://makecode.microbit.org/_Ph75My3deXRq`

Tạ Quang Việt:



Hình 9: *Sensor Microbit Program - Việt*

Link MakeCode: `https://makecode.microbit.org/_YM4CKJPppawL`

3.2.1 Extra points

Students can have extra points if one of following issues is proposed and implemented successfully:

- 2 microbits are used for the sensors node, to send the data and receive commands to/from the gateway
- 2 peripheral devices are connected to the microbit sensor node (LED, BUZZER or a RELAY).

Please explain your solution in this report and provide the source code by a sharable link from MakeCode. For the first option, explain how the ID can be used in the network. For the second one, please indicate the connection pins between the microbit sensor and the devices.

Đặng Quốc Thắng:
Sử dụng pin P1 và P2 để kết nối với 2 bóng đèn, điều khiển thông qua 2 nút bấm ở dashboard.

Nguyễn Công Thành:
Sử dụng Sensor Microbit để gửi dữ liệu nhiệt độ và ánh sáng cho Main Microbit; đồng thời sử dụng Sensor Microbit để nhận và hiển thị thông tin mà Main Microbit gửi thông qua gateway, được điều khiển thông qua dashboard. 2 Microbit cùng sử dụng một giá trị radio setup group để giao tiếp với nhau, ở đây em chọn giá trị là 231.
Link MakeCode: `https://makecode.microbit.org/_CRtL6aa31arV`

Tạ Quang Việt:
Sử dụng pin P0 và P1 để kết nối với 2 bóng đèn, điều khiển thông qua 2 nút bấm ở dashboard.
Link MakeCode: `https://makecode.microbit.org/_crH14CK596iC`