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# Computing Project 2018

# Design Engineering | Python | Micro:Bit

Smart School: Easy Attendance

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### Problem Specification

### Problem Definition

Attendance is currently taken by teachers which is very troublesome and time

consuming. Making a device that will have students mark their own attendance will lessen the load on the teachers and have students responsible for their own attendance.

### Stakeholders

Teachers: taking of attendance is troublesome

Students: uncertainty of attendance accuracy

### Project Purpose

Make a device for students to automatically make their attendance by transmitting a radio signal to another device that will record the attendance of all the students in a class.

1. **Brainstorming**

### Research Findings

* Scan a QR code using a mobile app to take attendance
* Use a micro:bit to send a radio signal to another micro:bit that will transfer the attendance data into the school system to mark attendance.
* Fingerprint scanner to mark attendance.
* Facial recognition scanner to mark attendance.
* ID card scanner to mark attendance.(EZ-link card)

### Building

### The Plan

Receiver

Sender

### Testing and Analyzing

### Test Cases

* + 1. **Normal Conditions**

1. 2 students from the correct class turn on their micro:bit.
2. 23 more students from the correct class turn on their micro:bit.
3. Button a is pressed to check current number of students present(receiver).
   * 1. **Error Conditions**
4. A student from the wrong class turns on his micro:bit.
5. Student micro:bits(sender) are on but the teacher’s micro:bit(receiver) is not on.
   * 1. **Boundary Conditions**
6. The teacher’s micro:bit(receiver) is turned on but no students have turn their micro:bits(sender) on yet and button a(receiver) is pressed to check the attendance.
7. The last student of the class turns on his micro:bit, all 26 students are present.
8. All students are present and button a(receiver) is pressed to check the total number of students present in that class.

### Analysis

* + 1. **Normal Condition Outcomes**

1. Attendance is taken, displays tick as confirmation on each student’s micro:bit(sender), displays the current total number of students present as each student’s attendance is recorded: 1,2(receiver).
2. Attendance is taken, displays tick as confirmation on each student’s micro:bit(sender), displays the current total number of students present as each student’s attendance is recorded: 3,4,5,6,...,23,24,25(receiver).
3. Current total is displayed: 25(receiver).
   * 1. **Error Condition Outcomes**
4. Attendance is not taken, a cross is displayed(sender) indicating that the student is not in the list of students for that class.
5. Attendance is yet to be taken and a loading screen is displayed(sender)
   * 1. **Boundary Condition Outcomes**
6. No students’ attendance has been marked yet, “0” is displayed(receiver) indicating that there are 0 students present.
7. The last student’s attendance is taken, 26 is displayed follow by a smiley face(receiver) indicating that all students from that class are present.
8. All students are present, “ALL 26 PRESENT” is displayed(receiver).

### Reviewing

### Limitations

Each receiver is limited to only 1-2 classrooms due to the limited range of the micro:bit’s radio.

### Possible Improvements

The teachers’ micro:bit(receiver) could be programmed in repeater fashion such that each class’ attendance will be “transported” by going through every class until it finally reaches the central micro:bit where everything can be loaded into the school system so that it will be a fully automated system instead of each teacher having to load their class’ attendance into the system themselves.