Exploration project

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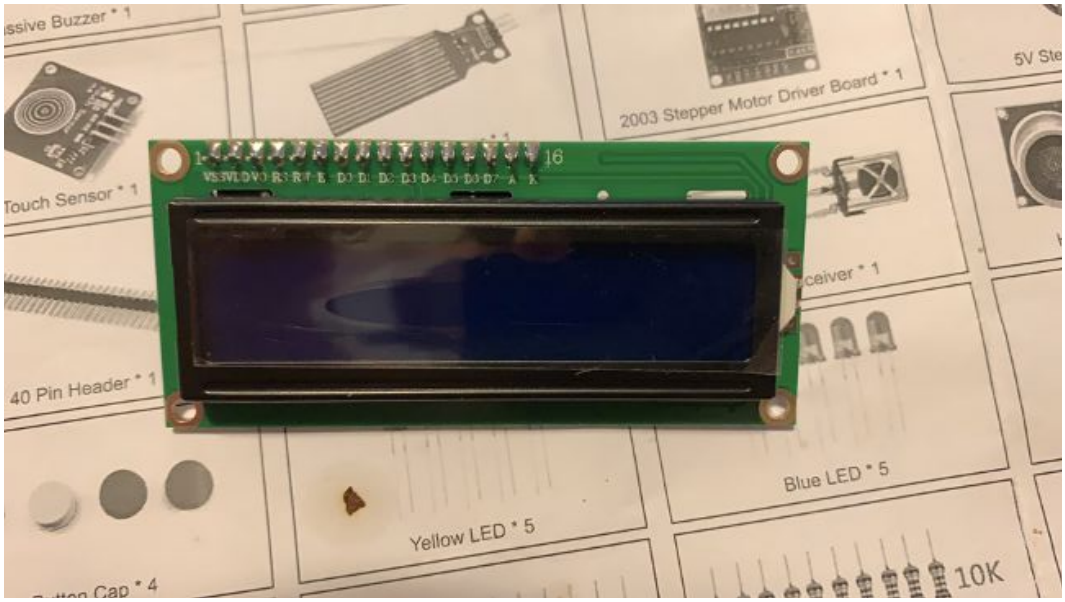
We do this project together, because she does not have kits yet and I do not have a windows device to support putty. We had told our professor and he allowed us to do that.

1, Introduction:

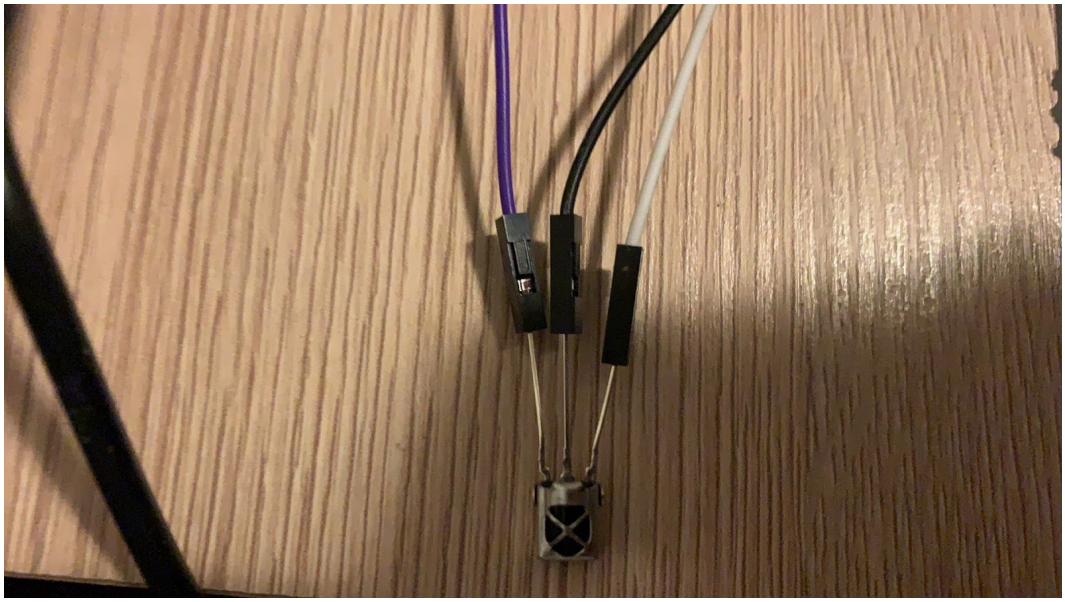
In this exploration, we had used an LCD1602 Module with IIC, Infrared Receiver and Remote control, which is not being introduced in the lab. Firstly, we decided to use 4 digits 7-segment Display, but then we found that the LCD 1602 Module will have a better display compared to 4 digits 7-segments Display, then we change to LCD 1602.
We try to use Remote control to input the number to show both in the putty and LCD 1602. After we watched the tutorial and found some source on the website, we connected our device and set a connection from Remote control to putty and Raspberry Pi, that worked well.
There are three options in our operator interface, the user can select their preference to control the raspberry pi.

2, The devices which we used:

LCD 1602 Module with IIC

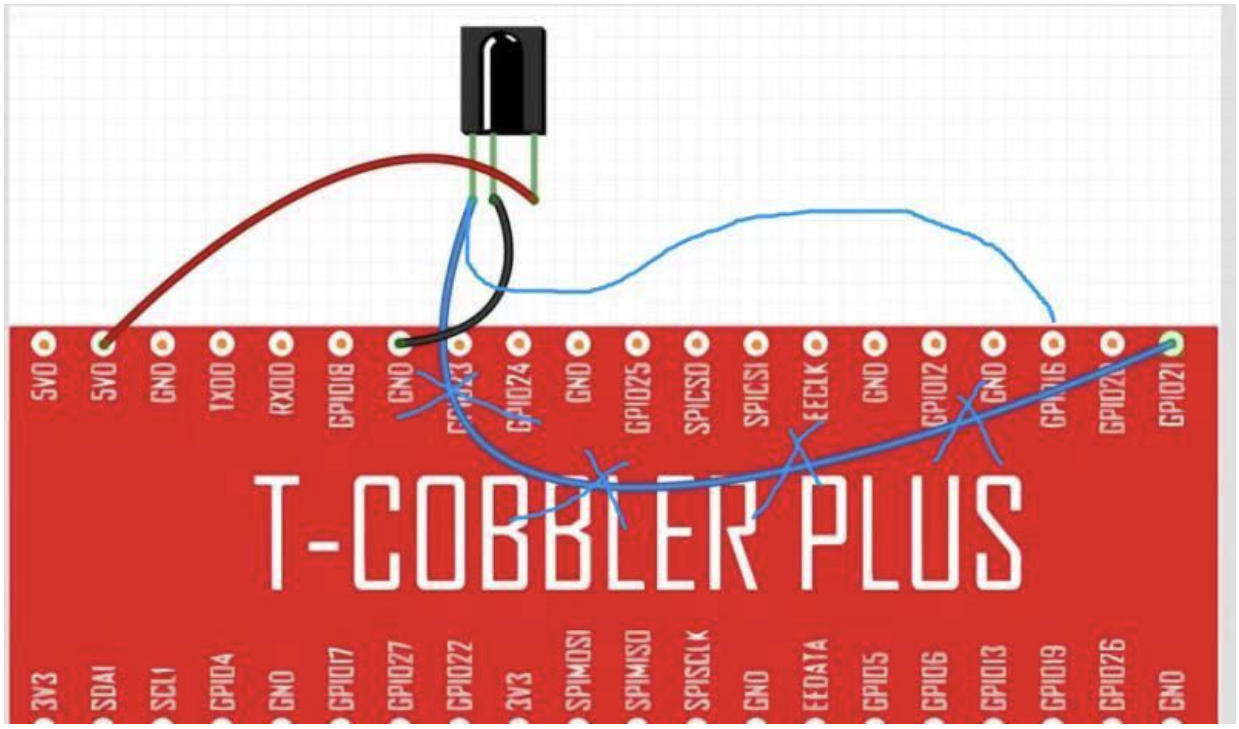


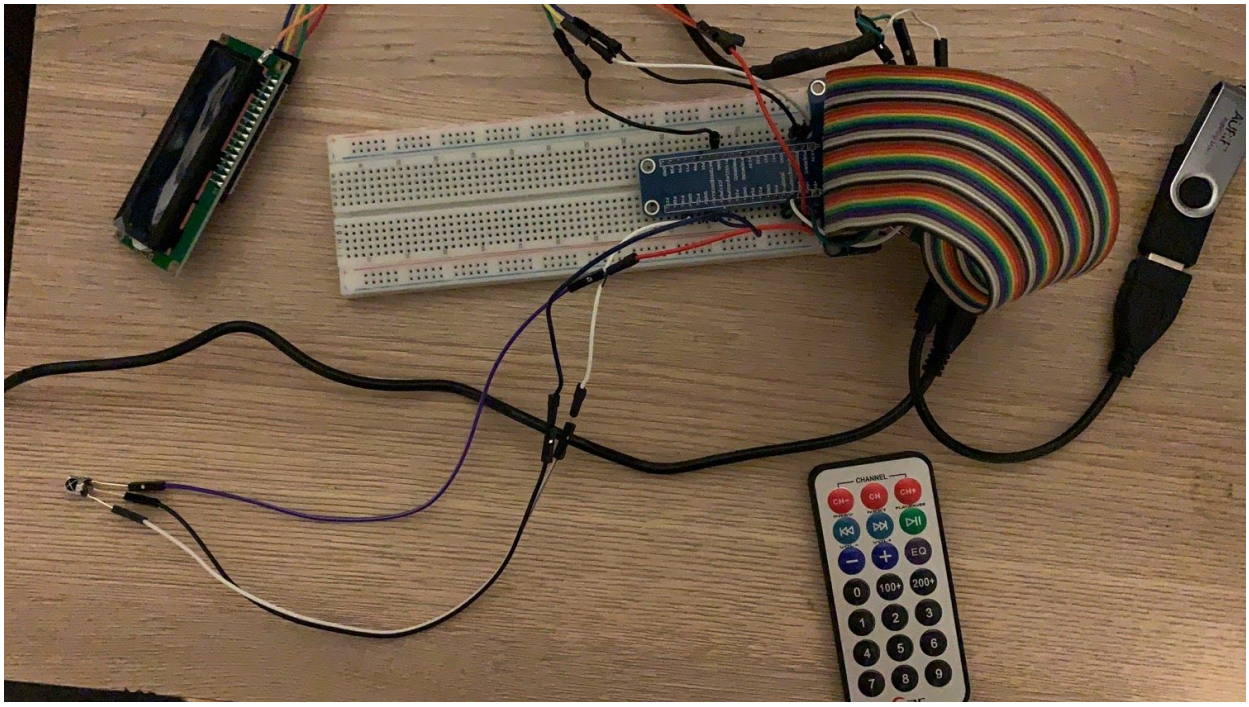
Infrared Receiver



Remote control

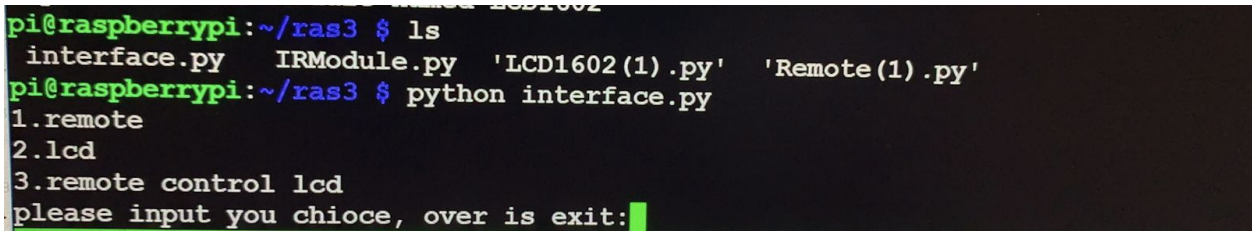
3, The connect picture:


5V0
5V0
GND
TXD0
RXD0
GPIO18
GND
GPIO24
GND
GPIO25
SPICS0
SPICS1
GND
GPIO12
GND
GPIO21
T-COBBLER PLUS
3V3
SDA1
SCL1
GPIO4
GND
GPIO17
GPIO27
GPIO22
3V3
SPIMOSI
SPIMISO
SPISCLK
GND
GPIO5
GPIO6
GPIO13
GPIO19
GPIO26
GND


CHANNEL
EQ
100+
200+

4, The three options for users in operator interface:

The operator interface:



There are 3 options as following:

Option 1, remote:

The putty will show our input from Remote Control:

Option 2, lcd:

The lcd 1602 Module will display our word in the python code:

Option 3, remote control lcd:

Both the putty and LCD 1602 Module will display our input in our Remote Control:

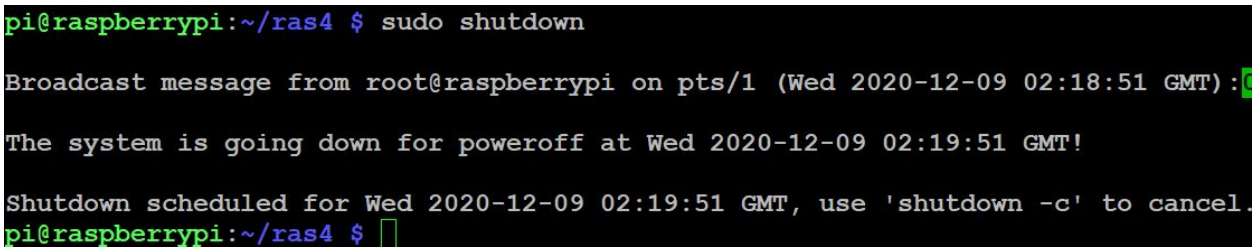
a. Input 8 in Remote Control:

b. Input 5 in Remote Control:

c. Input 9 in Remote Control:

The putty will also show us the same value as below:

Sudo shutdown:



For more Remote Control input, please see in our video.

5, The resources which we used by others:

For the Lcd1602, we uses iIC interface.
This design uses the SMBus library, which is from Github to drive the IIC of PI itself.

6, The trouble which we met:

6.1. We try to find how to let our raspberry pi get the input from the remote control.
6.2. We think many times for how to design a better operator interface which can use all our chosen devices efficiently.
6.3. The sender used a serial port for communication at the beginning, but the speed was slow and software updates could not be carried out.
Later, we set up the wifi.
6.4. Opened the SSH server.
6.5. The iIC interface of PI is not opened, but raspi-config is used to open the interface
6.6. The input for remote control sometimes be -1, at first we thought that is the wrong of code, but then after we checked, the remote control must face the Infrared Receiver and be closed.

We had learned how to set up the raspberry pi by WIFI by ourselves, we found our wifi ip address and set up the wifi connection to our raspberry pi, but not use the serial port. Then, we do not need to connect the serial port every time, which is more convenient.
And we found that the filezilla is a good tool to put our python code into raspberry pi, which is different from copying the code into USB drive or program in the putty directly.

7, Our reflection and conclusion:

All in all, in this exploration project, we learned how to use LCD1602 Modules with IIC, Infrared Receiver and Remote control and create an operator interface for them.
What is more, we found that using WIFI to connect the putty and raspberry is more convenient, which does not need to connect the port to our computer again and again.
To be specific, in the week 1 part, we decided to use 7 digits segment display, but in week 2, we found that the LCD1602 is better to show our input in the remote control. Because that can show our English words. Then we try to change our device and rework our design, and finish our design on time.
We hope that in the future, we can use the keyboard directly to let LCD1602 show our input directly, but not limit it to our remote control with only some digits.

Thank you for your reading and look forward to your feedback!