In order to control the display messages of the propeller displayer and achieve the automation of the whole system, Raspberry pi 3 is used to communicate with the propeller clock module.

Raspberry Pi sends the commands to Arduino and the Arduino will control the LED strip to display the different patterns.

I used the socket library to transmit the messages between Raspberry Pi and Arduino. I designed a simple communication protocol between these two device which includes sending message, receiving message, cleaning the buffer and response to make sure the communication is robust.

For text display. The Arduino stored the char library. And it stores some defaults string. Arduino displays the texts according to the commands from Raspberry Pi.

For time display. The Raspberry will get the current time and send it to the Arduino. The Arduino will display the time. And raspberry pi will send the update signal to the Arduino to update the time.

For music spectrum display. Raspberry Pi will decode the music and generate the music spectrum. For each frame, raspberry Pi will send 8 number which means the magnitude of 8 different frequency range. Arduino receives the signal and update each frame.