HW3: Use what has not been used
Note

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1 Design

This is a mock Server Rack monitor. This circuit was build with a purpose to use parts that I have not used before: 8-bit shift register, relay, NPN transistor, photoresistor, temperature and humidity sensor. The idea is that 8-bit shift register controls 8 LEDs which indicate the status of the server rack. If its normal - greeen LEDs are on. If the humidity or temperature rises to a warning point - yellow LEDs are on, if its above thresholds - red LEDs turn on and relay activates the motor fan. Photoresistor is connected through analog pin and detects if there is a source of light near by. If there is - all LEDs start blinking. The sensitivity of the photoresistor is controlled using NPN transistor and a potentionmeter. Live readings can be seen via local IP on a local network.

2 Test/Accuracy results

In general, this project was done through trial and error as I was building it. I am sure there are still some imperfections that could be corrected, but overall it works. The temperature and humidity sensor (DHT11) is definitely not the most accurate, but it does a sufficient job in this project.

3 Issues

The hardest part of this project was to thinking of an idea on how to use all of the parts that are needed. The only part that I did not use was a regular diode (not LED). My inital plan was to use a transistor and a diode to control the relay for the motor fan, but the relay I had was a relay module with all of these things already integrated in it. Since i was working with ESP8266 and not Arduino it was a bit complicated to understand its pinout (and I am sure I have only tipped my toes in this water), but I managed to understand the parts that I needed. Configuring the shift register was also a bit tricky, but after some research and a couple of videos I got it to work. Overall, the most difficult part of this project was not having a good idea and just kind of using all of the components in any way possible.