智慧型桌燈

Smart Desk Lamp

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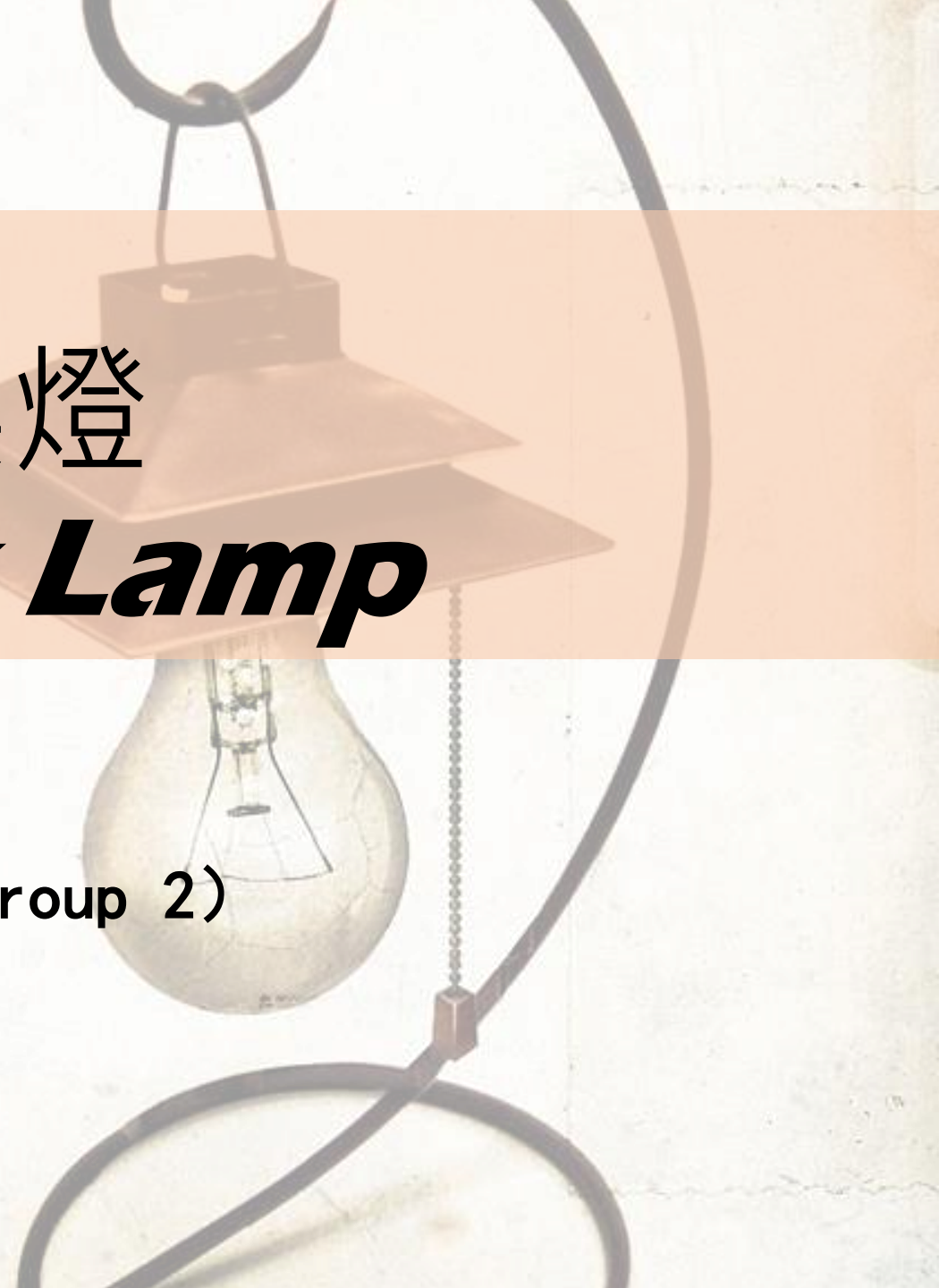
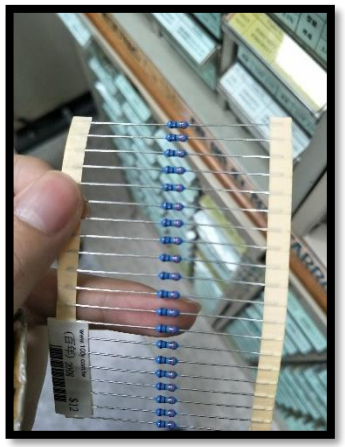
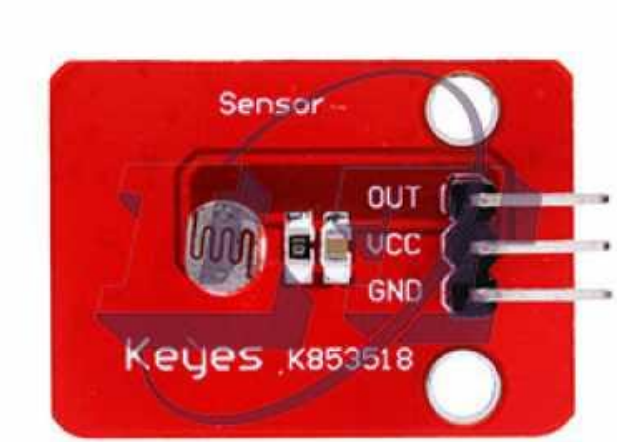


function

- Switch on / off
- Light intensity (Manual controlled by FPGA)
- Light intensity (Auto controlled by Photoresistor with Arduino Uno)
- Timer
- Alarm + blinking

Material





- ✓ FPGA
- ✓ Keyboard
- ✓ Pmod Audio

Basic concept of the design

- **LED**
  - Powered by Pmod
- **Manual light intensity control**
  - Using PWM module with duty cycle 5% ~ 25%
- **Auto light intensity control**
  - Using Arduino to convert the analog signal by photoresistor module to digital signal
  - Output the digital signal to Pmod for further control

Basic concept of the design (continue)

- **Timer**
  - Using LED 7-segment display + keyboard as input
- **Alarm**
  - Using Pmod Audio device
- **Blinking**
  - Using PWM module with approximately duty cycle 0.5%

Difficulty explanation

- **Normal**
  - The project divided into four modules
  - Seems easy as a single module
  - But the difficulty is combined all the modules since needs to redesign a finite state machine and debug

Completion

- As expected, all the functions were implemented

Task division

王得銘	• Timer • Auto light intensity control with photoresistor and Arduino Uno
伍瀚翔	• Alarm • Manual light intensity control
王得銘 && 伍瀚翔	• Combine all the module • Design FSM • Debug

Demo time