

Lab 7: Requirement Description

- **Interrupt**
 - **Video**
<https://www.youtube.com/watch?v=hh0vxA1bDjA>
 - **Hackmd :**
<https://hackmd.io/@tUJ6QXHqR52HVF7JMKYd3A/ryxMiOGdK>
- **Basic (70%) :**
 - **Description :** Initially, blink 4 LEDs with the following order: **RD0 -> RD1 -> RD2 -> RD3**. When clicking **RB0** button, you should brighten even numbered LEDs at first, then brighten odd numbered LEDs. After clicking RB0 again, it will go back to the original order. Every LED should be on for **0.5** seconds.
 - **Example:**

RD0->RD1->RD2->RD3 -click-> RD0 & RD2 -> RD1 & RD3 -

click-> RD0->RD1->RD2->RD3
 - **Standard of grading:**
 1. Use **ISR** to handle the button event.
 2. Button: **RB0**, 4 LEDs: **RD0~RD3**
 3. Don't use bra, goto... any related jump instructions in ISR.
 4. Write in **Assembly**.
- **Advanced (30%) :**
 - **Description:**

Initially, blink 4 LEDs with the following order: **RD0 -> RD1 -> RD2 -> RD3**. Every LED should be on for **1** second. When clicking **RB0** button, every LED should be on **0.5** seconds. After clicking RB0 again, every LED should be on **0.25** seconds. Then clicking RB0 again, it will go back to 1 second.
 - **Example:**

1 sec. -click-> 0.5 sec. -click-> 0.25 sec. -click-> 1 sec.
 - **Standard of grading:**

1. Use **ISR** to handle the button event.
2. Button: **RB0**, 4 LEDs: **RD0~RD3**
3. Don't use bra, goto... any related jump instructions in ISR.
4. Write in **Assembly**.

● **Bonus(20%) :**

○ Description:

Initially, blink 4 LEDs with the following order: RD0, RD1, RD2, RD3. Every LED should be on for 0.5 seconds. When clicking RB0 button, change the blinking direction immediately.

○ Example:

RD0 -> RD1 -> RD2 -**click**-> RD1 -> RD0 -> RD3 -> RD2 -> RD1 -> RD0 -> RD3 -**click**-> RD0 -> RD1 -> RD2 -> RD3 -> RD0

○ Standard of grading:

1. Use **ISR** to handle the button event.
2. Button: **RB0**, 4 LEDs: **RD0~RD3**
3. Don't use delay macro in ISR
4. Don't use bra, goto... any related jump instructions in ISR.
5. Write in **Assembly**.

● **Hints:**

1. **RB0 and INT0 use the same pin.**
2. Remember to turn on the Global Interrupt Enable bit.
3. Set up **External Interrupt** in INTCON, INTCON2.
4. Don't forget to clear the interrupt flag bit in ISR.