Lab 09: Requirement Description

- ADC
  - Video: https://youtu.be/srWLjdS6xzU
  - HackMD: https://hackmd.io/@mprocessor2024/SyIkc2vYA
- Basic (70%)
  - Description：

    Use four LEDs to represent numbers from 0 to 9 in binary form. As you rotate a variable resistor at a constant speed, the LEDs should light up sequentially to display the numerical portion of your student ID. For instance, if your student ID is P74123456, the bulbs will illuminate in binary to represent the sequence: 7, 4, 1, 2, 3, 4, 5, 6.
  - Example： https://youtu.be/W9kmFCN2TB4
- Advanced (30%)
  - Description：

    Use four LEDs to indicate odd or even numbers based on the voltage level of a variable resistor. As the resistor is rotated, the ADC measures the voltage, and the LEDs light up in binary to represent the numbers. When the voltage increases, the LEDs will display odd numbers (1, 3, 5, 7, 9, 11, 13, 15). When the voltage decreases, the LEDs will display even numbers (0, 2, 4, 6, 8, 10, 12, 14).
  - Example： https://youtube.com/shorts/oE5rzts482o?feature=share
- Bonus (20%)
  - Description：

    Use a variable resistor to implement a dimming LED. Using the PWM setup you learned from Lab 8, adjust the PWM duty cycle based on the rotation of the variable resistor. When the variable resistor is turned fully to the right or left, the LED will be dim; when the variable resistor is centered, the LED will be at its brightest.