

## **README - GROUP 15**

### **Pendulum Control System**

#### Introduction:

In this project, we analyze and develop a control strategy for the inverted pendulum system. The goal is to design a control system that can bring the pendulum to rest with minimal error at a user-specified angle within  $\pm 15^\circ$ .

#### System Requirements:

Arduino board

Encoder library (<https://github.com/PaulStoffregen/Encoder>)

PIDController library (<https://github.com/DonnyCraft1/PIDArduino>)

#### Setup:

Connect the pins to the Arduino board:

ENCODER\_A: Pin 2

ENCODER\_B: Pin 3

MOTOR\_CCW: Pin 11

MOTOR\_CW: Pin 10

enA: Pin 9

#### required libraries:

Encoder library by Paul Stoffregen (<https://github.com/PaulStoffregen/Encoder>)

PIDController library by DonnyCraft1 (<https://github.com/DonnyCraft1/PIDArduino>)

Upload the code to your Arduino board.

#### Usage:

The system will ask to enter the desired angle for the pendulum (-15 to 15) and press Enter.

The system will then ask you to enter the PID values (kp, ki, kd).

Enter the values and press Enter.

The system will print the desired angle and the current angle to the Serial Monitor.