1. **Objective**

In this task, the aim is to connect the Joystick with motor, click in on button then control motor direction left or right by joystick and if you need motor does not move click in off button.

1. **Components and Tools**
2. Joystick Module

* Control motor direction.
* On and Off buttons

1. Arduino Mega

* Microcontroller for processing joystick input and controlling the motor driver.

1. IBT-2 Motor Driver

* High-power motor driver to control the motor's speed and direction.

1. Power Supply

* Provides power to the motor and other components.

1. Motor

* The actuator driven by the IBT-2 based on joystick input.

1. Explanations
2. Why we use IBT-2 Motor driver
   1. Voltage and Current Amplification

The Arduino mega use 5v but motor use 12v for this we link motor driver

To tack 5v from Mega then use external 12v power supply to drive motor

* 1. Electrical Isolation

The motor driver to saved Arduino from being damaged if is tack 12v (Arduino use just 5v)

1. Why convert the potentiometer's raw analog reading (0–1023) into a range (0–255)
   1. The PWM signal used to control motor speed (via analogWrite) on most Arduino boards is typically limited to a range of 0–255.
   2. By mapping the potentiometer's value to 0–255, you directly match the range needed for analogWrite, avoiding unnecessary calculations during runtime.
2. Data Sheets
   1. IBT-2 Motor driver
      1. IBT-2 pin 1 (RPWM) to Arduino Nano pin 3(PWM)
      2. IBT-2 pin 2 (LPWM) to Arduino Nano pin 5(PWM)
      3. IBT-2 pins 3 (R\_EN) to 5V power supply
      4. IBT-2 pins 4 (L\_EN) to 5V power supply
      5. IBT-2 pins 5 (R\_IS) not connected
      6. IBT-2 pins 6 (L\_IS) not connected
      7. IBT-2 pins 7 (VCC) not connected
      8. IBT-2 pin 8 (GND) to GND
      9. LED to pin 13
      10. Potentiometer to pin A0
   2. JoyStick

A computer screen with a diagram of a circuit board

Description automatically generated