Exercise

You are given:

- An Arduino Uno
- An L298N H-bridge motor driver
- A 12 V DC motor (rated no-load speed:3000 RPM @ 12 V)
- Encoder

You must make the motor run at a **commanded speed of 200 RPM**.

Part A: Open-loop speed control

1. Draw a block diagram of your open-loop system.
2. Explain how you will map a speed command of 200 RPM.
3. Describe two reasons why this open-loop scheme may not hold 200 RPM in practice.

Part B: Closed-loop speed control

1. Draw a block diagram of a closed-loop system.
2. Implement a speed controller (explain the control algorithm).
3. Provide the pseudocode.
4. State any assumptions.