Experiment No. 7

Aim: To validate bipolar stepper motor actuation through Darlington array (ULN2003) driver implementation, examining step resolution.

Simulator used: Wokwi

Circuit Layout:

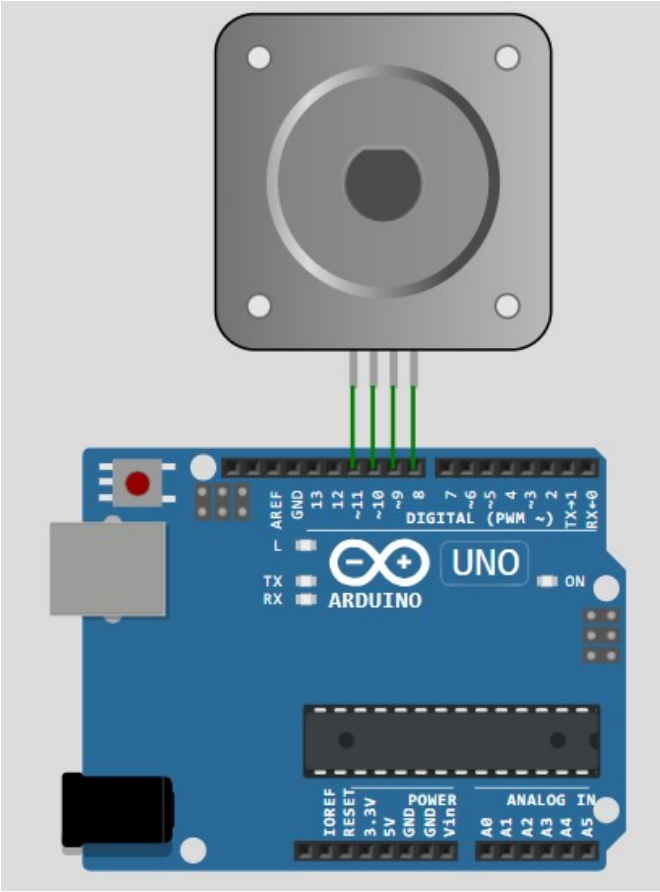

Figure 1: Interfacing stepper motor with Arduino

Theory:

Stepper motor

Darlington array

Code used:

```
#include <Stepper.h>

const int stepsPerRevolution = 200;  // change this to fit the number of steps per revolution
```

```
// for your motor

// initialize the stepper library on pins 8 through 11:
Stepper myStepper(stepsPerRevolution, 8, 9, 10, 11);

void setup() {
  // set the speed at 60 rpm:
  myStepper.setSpeed(60);
  // initialize the serial port:
  Serial.begin(9600);
}

void loop() {
  // step one revolution  in one direction:
  Serial.println("clockwise");
  myStepper.step(stepsPerRevolution);
  delay(500);

  // step one revolution in the other direction:
  Serial.println("counterclockwise");
  myStepper.step(-stepsPerRevolution);
  delay(500);
}
```

Simulation Outcome:

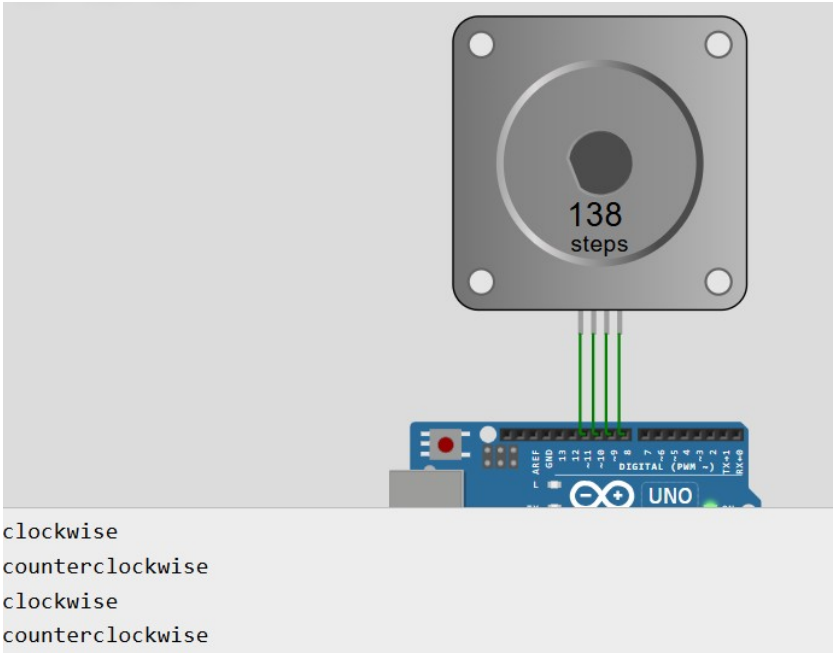

Figure 2: Stepper motor operation

Result:

**To be completed by the student