

## Project 6 ( Stepper Motor ) :

### Requirements :

- 1 . Arduino uno 1x
2. stepper motor 1x
3. uln2003 motor driver

### Hardware setup :

1 - stepper motor connected to the motor driver

2 – Pin's Motor driver & Arduino :

Motor driver	Arduino uno
1N1	D8
1N2	D9
1N3	D10
1N4	D11
-	GND
+	VCC +5V

### Code :

```
// Project 6 [ p11 ]  
const int mor1 = 8;  
const int mor2 = 9;  
const int mor3 = 10;  
const int mor4 = 11;  
const int speedN = 8;  
void Step_A(){
```

```
digitalWrite(mor1, HIGH);  
digitalWrite(mor2, LOW);  
digitalWrite(mor3, LOW);  
digitalWrite(mor4, LOW); }
```

```
void Step_B(){
```

```
    digitalWrite(mor1, LOW);  
    digitalWrite(mor2, HIGH);  
    digitalWrite(mor3, LOW);  
    digitalWrite(mor4, LOW);  
}
```

```
void Step_C(){
```

```
    digitalWrite(mor1, LOW);  
    digitalWrite(mor2, LOW);  
    digitalWrite(mor3, HIGH);  
    digitalWrite(mor4, LOW);  
}
```

```
void Step_D(){
```

```
    digitalWrite(mor1, LOW);  
    digitalWrite(mor2, LOW);  
    digitalWrite(mor3, LOW);  
    digitalWrite(mor4, HIGH);  
}
```

```
void Step_OFF(){
```

```
    digitalWrite(mor1, LOW);  
    digitalWrite(mor2, LOW);  
    digitalWrite(mor3, HIGH);  
    digitalWrite(mor4, LOW);  
}
```

```
void Step_Forward(){
```

```
    Step_A();  
    delay(speedN);  
    Step_B();  
    delay(speedN);  
    Step_C();
```

```
delay(speedN);  
Step_D();  
delay(speedN); }
```

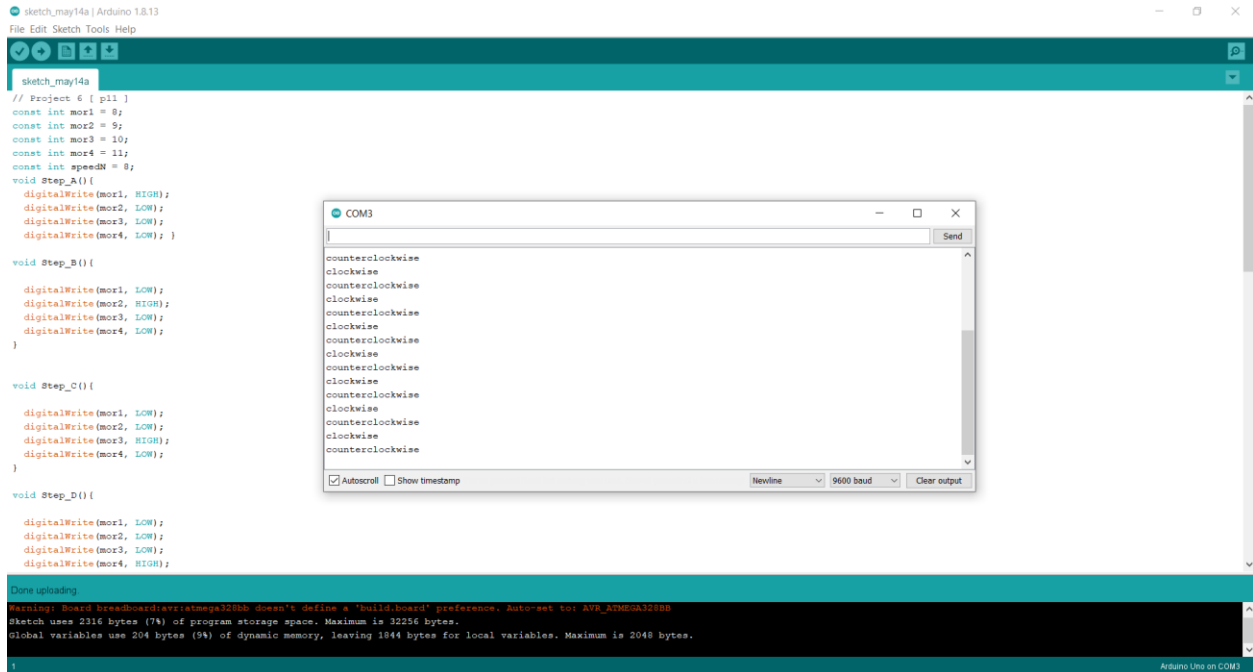
```
void backward(){  
    Step_D();  
    delay(speedN);  
    Step_C();  
    delay(speedN);  
    Step_B();  
    delay(speedN);  
    Step_A();  
    delay(speedN);  
}
```

```
void setup() {  
    // initialize the 8 pin as an output:  
    pinMode(mor1, OUTPUT);  
    pinMode(mor2, OUTPUT);  
    pinMode(mor3, OUTPUT);  
    pinMode(mor4, OUTPUT);  
    Serial.begin(9600);  
}
```

```
void loop(){  
    unsigned int stepN = 48;  
    Serial.println("clockwise");  
    Step_OFF();  
    while(stepN>0){  
        Step_Forward();  
        stepN -- ;  
    }  
    delay(2000);  
    Serial.println("counterclockwise");  
    Step_OFF();  
    stepN = 48;  
    while(stepN>0){  
        backward();  
        stepN -- ;  
    }  
    delay(2000);  
}
```

Result :

Serial screen :



The screenshot shows the Arduino IDE interface. The main editor displays a sketch named 'sketch\_may14a' with the following code:

```
// Project 6 [ p11 ]
const int mor1 = 8;
const int mor2 = 9;
const int mor3 = 10;
const int mor4 = 11;
const int speedN = 8;
void Step_A(){
  digitalWrite(mor1, HIGH);
  digitalWrite(mor2, LOW);
  digitalWrite(mor3, LOW);
  digitalWrite(mor4, LOW); }

void Step_B(){
  digitalWrite(mor1, LOW);
  digitalWrite(mor2, HIGH);
  digitalWrite(mor3, LOW);
  digitalWrite(mor4, LOW);
}

void Step_C(){
  digitalWrite(mor1, LOW);
  digitalWrite(mor2, LOW);
  digitalWrite(mor3, HIGH);
  digitalWrite(mor4, LOW);
}

void Step_D(){
  digitalWrite(mor1, LOW);
  digitalWrite(mor2, LOW);
  digitalWrite(mor3, LOW);
  digitalWrite(mor4, HIGH);
}
```

The Serial Monitor window, titled 'COM3', is open and shows the following output sequence:

```
counterclockwise
clockwise
counterclockwise
clockwise
counterclockwise
clockwise
counterclockwise
clockwise
counterclockwise
clockwise
counterclockwise
clockwise
counterclockwise
```

The status bar at the bottom indicates 'Done uploading.' and provides a warning: 'Warning: Board breadBoard:avr:atmega328pb doesn't define a 'build.board' preference. Auto-set to: AVR\_ATMEGA328PB'. It also shows memory usage: 'Sketch uses 2316 bytes (7%) of program storage space. Maximum is 32256 bytes.' and 'Global variables use 204 bytes (9%) of dynamic memory, leaving 1844 bytes for local variables. Maximum is 2048 bytes.'

Board images :

