



Worksheet 5

Student Name: Vipin Rawat

UID: 23MCI10072

Branch: MCA(AI/ML)

Section/Group: MAM-3(A)

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Subject Name: Internet Of Things

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1. Aim/Overview of the practical:

Design a car having four wheels (DC Motors) using motor-driven IC and interface with Arduino. It will follow certain conditions

- a) All the wheels moving in the backward direction for 5 secs
- b) All the wheels moving in the forward direction for 5 secs
- c) one wheels will be moving in clockwise and the rest three will move in anti-clockwise direction

2. Apparatus (For applied/experimental sciences/materials based labs):

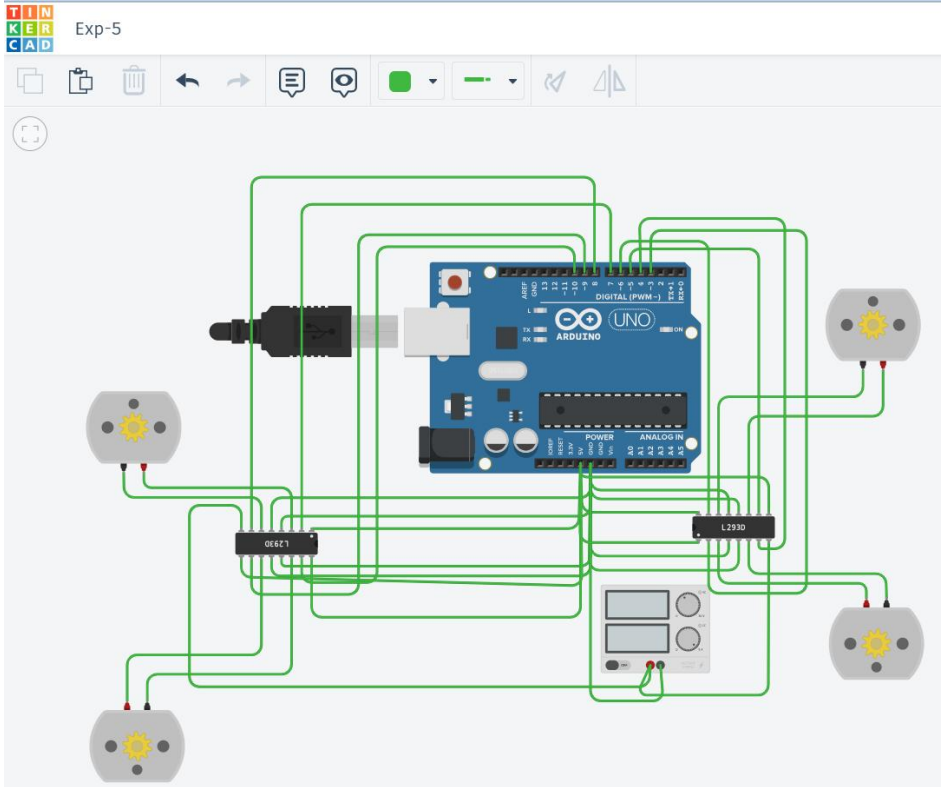
Hardware Requirements

- 1) Arduino UNO
- 2) 4 DC Motors
- 3) L293D (Motor Driver)
- 4) Power Supply(9-12v)

Software requirements

- 1) **TinkerCad** : Tinkercad is used for designing and simulating circuits virtually.
- 2) **Arduino IDE**: Arduino IDE is used for writing, compiling, and uploading code to Arduino microcontroller boards.

3. Circuit Diagram(TinkerCad):



4. Coding:

```
// Motor Control Pins
#define motorA1 7
#define motorA2 8
#define motorB1 9
#define motorB2 10
#define motorC1 3
#define motorC2 4
#define motorD1 5
#define motorD2 6
```

```
void setup() {
  pinMode(motorA1, OUTPUT);
  pinMode(motorA2, OUTPUT);
  pinMode(motorB1, OUTPUT);
  pinMode(motorB2, OUTPUT);
  pinMode(motorC1, OUTPUT);
  pinMode(motorC2, OUTPUT);
  pinMode(motorD1, OUTPUT);
  pinMode(motorD2, OUTPUT);
}
```



// Move motors in the given sequence

```
void loop() {
```

```
  // a) Move all wheels backward for 5 seconds
```

```
  digitalWrite(motorA1, LOW);
```

```
  digitalWrite(motorA2, HIGH);
```

```
  digitalWrite(motorB1, LOW);
```

```
  digitalWrite(motorB2, HIGH);
```

```
  digitalWrite(motorC1, LOW);
```

```
  digitalWrite(motorC2, HIGH);
```

```
  digitalWrite(motorD1, LOW);
```

```
  digitalWrite(motorD2, HIGH);
```

```
  delay(5000);
```

```
  // b) Move all wheels forward for 5 seconds
```

```
  digitalWrite(motorA1, HIGH);
```

```
  digitalWrite(motorA2, LOW);
```

```
  digitalWrite(motorB1, HIGH);
```

```
  digitalWrite(motorB2, LOW);
```

```
  digitalWrite(motorC1, HIGH);
```

```
  digitalWrite(motorC2, LOW);
```

```
  digitalWrite(motorD1, HIGH);
```

```
  digitalWrite(motorD2, LOW);
```

```
  delay(5000);
```

```
  // c) One wheel clockwise, rest three anti-clockwise
```

```
  digitalWrite(motorA1, HIGH); // Wheel A clockwise
```

```
  digitalWrite(motorA2, LOW);
```

```
  digitalWrite(motorB1, LOW); // Wheel B anti-clockwise
```

```
  digitalWrite(motorB2, HIGH);
```

```
  digitalWrite(motorC1, LOW); // Wheel C anti-clockwise
```

```
  digitalWrite(motorC2, HIGH);
```

```
  digitalWrite(motorD1, LOW); // Wheel D anti-clockwise
```

```
  digitalWrite(motorD2, HIGH);
```

```
  delay(5000);
```

```
}
```



5. Learning outcomes (What I have learnt):

1. Understanding Motor Control with Arduino & L293D.
2. Programming and Logic Development.
3. Robotics and Embedded Systems Concepts.
4. Understand the working of an L293D Motor Driver IC.