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Experiment No:- 6

→ Aim : To control servo control using Arduino.

- control system

Eg : Temperature control of room.

Design 1

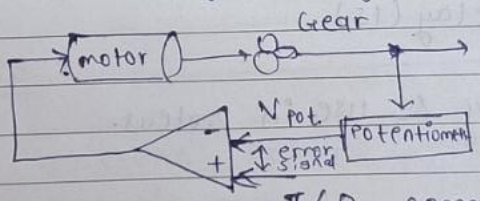
→ Manual control (open loop system)

Design 2

→ Actual temperature = designed temperature ;
Automated (closed loop) error signal minimized.

- servo mechanism

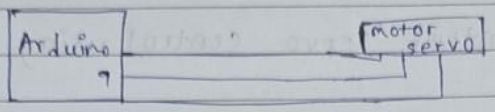
It has motor, gears, potentiometer, intelligent circuits. Here x degree angle → converts to V_x



$V_{pot} = V_x$ $E_v = 0$
V_s stops gear stops rotating. Eg: SG 90 servo motor.

- consume 10mA (1)[idle] 100mA - 250mA [rotating]

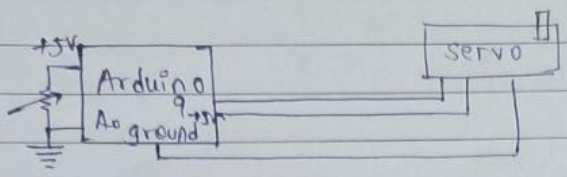
Here, provides a pulse after every 20ms.
pulse high for 1ms servo is 0 degrees.
1.5 ms servo is 90 degrees
2 ms servo is 180 degrees.



Code :

```
#include <servo.h>
 Servo int myservo; // create servo object
  Int Pos = 0; // variable.
      void setup () {
      myservo. attach (9);
      }
    void loop () {
      for ( Pos = 0; Pos < 180; Post = 1 )
        // in steps of degrees.
          myservo. write ( POS);
          delay (15)
      }
    for ( POS = 180 : .POS > = 0; Pos-1).
        myservo . write ( POS);
        Delay (15)
      }
    verify & use in proteus.
```

- There are libraries in IDE.



To get different degree using variable resistor (Pot)
0 - 180°
map. (mapthevalue).

- code

```
#include <servo.h>
    Servo myservo; // create servo object.
      int pot pin = 0;
       int val;
      void setup() {
        myservo attach(9); }
     void loop() {
        val = analog Read (Pot Pin);
        val = map( val, 0, 1023, 0, 18); //scale it to use it.
     myservo; write (val); // sets servo position.
        delay (15);
```

→ Conclusion : with the use of resistance varrying the servo motor starts and stops rotating with the use of arduino.

→ Applications :

i) Cameras, antenna, Robotic, Textile industry.
ii) Robotics - Robotic arms.
iii) Conveyer belts.
iv) Robotic vehicles & solar traking system.