Maharshi Karve Stree Shikshan Samstha's
Cummins College of Engineering for Women
Karve Nagar, Pune
(An autonomous Institute affiliated to Savitribai Phule Pune University)

"शीलं परं भूषणम्"

Department of Electronics and Telecommunication

A. Y. 2022-23 **SEM- I**

T. Y. B. Tech.
Internet of Things Lab

EXPERIMENT 5

Title: Study to control actuators based on real time sensor data

Objective: Write a program to control Actuators based on real time sensor data.

Software used: Arduino IDE

Theory:

Algorithm / code :

```
#include <Servo.h>
#define trigPin 23
#define echoPin 22
#define servoPin 13
#define thresholdDist 50
Servo servo;

float duration_us,distance_cm;

void setup() {
Serial.begin (9600);
pinMode(trigPin, OUTPUT);
pinMode(echoPin, INPUT);
servo.attach(servoPin);
servo.write(0);
}
void loop() {
digitalWrite(trigPin, LOW);
delayMicroseconds(10);
digitalWrite(trigPin, HIGH);
delayMicroseconds(10);
```

```
duration_us = pulseIn(echoPin, HIGH);
distance_cm = 0.017*duration_us;
if (distance_cm < thresholdDist) {
Serial.println("the distance is less than 50");
servo.write(90);
}
else {
Serial.println("the distance is more than 50");
servo.write(0);

}

Serial.print("distance: ");
Serial.print(distance_cm);
Serial.println(" cm");

delay(500);
}
```

```
the distance is less than 50
distance: 6.63 cm
the distance is less than 50
distance: 5.80 cm
the distance is less than 50
distance: 7.04 cm
the distance is less than 50
distance: 5.80 cm
the distance is less than 50
distance: 7.46 cm
the distance is less than 50
distance: 6.20 cm
the distance is less than 50
distance: 5.01 cm
the distance is more than 50
distance: 1200.27 cm
the distance is more than 50
distance: 1200.44 cm
the distance is more than 50
distance: 1200.44 cm
the distance is less than 50
distance: 6.63 cm
the distance is less than 50
distance: 9.37 cm
the distance is more than 50
distance: 1200.13 cm
the distance is less than 50
distance: 7.70 cm
the distance is less than 50
distance: 7.75 cm
the distance is less than 50
distance: 3.83 cm
the distance is more than 50
distance: 1200.23 cm
```

Output:

Conclusion: Actuators can be interfaced with ESP32 and can be controlled based on sensor. Actuators receive a source of energy and use it to move something. To put it another way,the actuator converts a source of energy into a physical-mechanical motion. A butterfly valve is operated by turning the Handwheel connected to the rotary actuator.We can classify actuators into the following two types according to the type of motion they exhibit.

Linear Actuators move a body or mechanism in a linear direction. In other words, they provide push-pull motion to a rigid body or mechanism.