import processing.serial.\*;

Serial myPort;

String data;

int iAngle = 0;

int iDistance = 0;

void setup() {

size(800, 600);

myPort = new Serial(this, "COM8", 9600); // Change to your COM port

myPort.bufferUntil('.');

smooth();

textFont(createFont("Arial", 20));

}

void draw() {

background(0);

// Draw title

fill(0, 255, 0);

textAlign(CENTER);

textSize(28);

text("Home Security RADAR", width / 2, 40);

translate(width / 2, height - 20); // Place radar origin at bottom center

drawRadarGrid();

drawSweepLine();

drawObjectDot(iAngle, iDistance);

}

void serialEvent(Serial p) {

data = p.readStringUntil('.');

if (data != null) {

data = trim(data);

String[] parts = split(data, ',');

if (parts.length == 2) {

iAngle = int(parts[0]);

iDistance = int(parts[1]);

}

}

}

void drawRadarGrid() {

stroke(0, 255, 0);

noFill();

// Draw semicircular arcs for 10–40 cm

for (int i = 1; i <= 4; i++) {

float radius = i \* 100; // each 100 pixels = 10 cm

arc(0, 0, radius \* 2, radius \* 2, PI, TWO\_PI);

}

// Draw angle lines (every 30 degrees)

for (int angle = 0; angle <= 180; angle += 30) {

float x = cos(radians(angle)) \* 400;

float y = sin(radians(angle)) \* 400;

line(0, 0, x, -y);

}

// Draw distance labels

fill(0, 255, 0);

textSize(12);

textAlign(CENTER);

for (int i = 1; i <= 4; i++) {

text(i \* 10 + " cm", 0, -i \* 100 + 15);

}

}

void drawSweepLine() {

stroke(0, 255, 0);

strokeWeight(2);

float x = cos(radians(iAngle)) \* 400;

float y = sin(radians(iAngle)) \* 400;

line(0, 0, x, -y);

}

void drawObjectDot(int angle, int distance) {

if (distance > 0 && distance <= 40) {

float r = map(distance, 0, 40, 0, 400);

float x = cos(radians(angle)) \* r;

float y = sin(radians(angle)) \* r;

// Color based on distance

if (distance <= 10) {

fill(255, 0, 0); // Red

} else if (distance <= 20) {

fill(255, 50, 50); // Light Red

} else if (distance <= 30) {

fill(0, 255, 0); // Green

} else {

fill(0, 0, 255); // Blue

}

noStroke();

ellipse(x, -y, 10, 10);

}

}