

CURRENCY GUARD

**A report submitted in partial fulfilment of the Academic requirements for the
award of the degree of**

Bachelor of Technology

Submitted by

B.RAHUL KUMAR (22H51A6673)

CH.SATHVIKA (22H51A6674)

DARSHAN (22H51A6676)

K.HARSHITHA (22H51A6693)

M.DEEKSHIT (22H51A66A2)

UNDER THE COURSE

ENGINEERING EXPLORATION & PRACTICE



CENTRE FOR ENGINEERING EDUCATION RESEARCH

CMR COLLEGE OF ENGINEERING & TECHNOLOGY

(Autonomous)

(NAAC Accredited with 'A+' Grade & NBA Accredited)

(Approved by AICTE, Permanently Affiliated to JNTU Hyderabad)

KANDLAKOYA, MEDCHAL ROAD, HYDERABAD-501401 2022-2023.

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EXPLORE TO INVENT

CERTIFICATE

This is to certify that the report entitled "**CURRENCY GUARD**" is a bonafide work done by B.Rahul(22H51A6673),Ch.Sathvika(21H51A6674),Darshan(22H51A6676), k.Harshitha(22H51A6693), M.Deekshit(22H51A66A2) of I year B.Tech, in partial fulfilment of the requirements for the award of the degree of Bachelor of Technology, submitted to Centre for Engineering Education Research, CMR College of Engineering & Technology, Hyderabad during the Academic year 2021-2022.

(Names of the project coordinators)

1. Mr.K.SATISH ASST.PROF CSE/CEER

2. Mr.Y.VASANTHA RAO ASST.PROF ECE/CEER

Mr.B.SURESH RAM

3. Mr.S.SURESH ASST.PROF IT/CEER

CEER HOD

DECLARATION

We, the students of I year B.Tech of Centre of Engineering Education Research, CMR COLLEGE OF ENIGNEERING & TECHNOLOGY, Kandlakoya, Hyderabad, hereby declare, that under the supervision of our course coordinators, we have independently carried out the project titled "**CURRENCY GUARD**" and submitted the report in partial fulfilment of the requirement for the award of Bachelor of Technology in by Jawaharlal Nehru Technological University, Hyderabad (JNTUH) during the academic year 2022-2023

Name of the student	Roll number	Signature of the student
B.RAHUL KUMAR	(21H51A6673)	
CH.SATHVIKA	(21H51A6674)	
DARSHAN	(21H51A6676)	
K.HARSHITHA	(21H51A6693)	
M.DEEKSHIT	(21H51A66A2)	

INTERNAL EXAMINAR

EXTERNAL EXAMINAR

ACKNOWLEDMENT

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Finally, we thank all our faculty members and Lab Assistants for their valid support.

We own all our success to our beloved parents, whose vision, love and inspiration has made us reach out for these glories.

ABSTRACT

The “**CURRENCY GUARD**” system project aims to address the challenges posed by the scarcity of coins in various sectors. The objective of this project is to develop an efficient and reliable system that facilitates the exchange of paper currency into coins. By implementing this system, we aim to improve transactional efficiency, reduce delays, and enhance customer satisfaction. The project will involve the integration of automated machines and secure processes to ensure accurate coin dispensation. Through this initiative, we anticipate promoting coin circulation, mitigating revenue losses, and establishing a seamless payment system across diverse industries. The success of this project holds the potential to alleviate the coin shortage problem and contribute to the overall growth and stability of the economy.

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CHAPTER-1

1.INTRODUCTION

Our proposed project focuses on addressing the challenges faced by bus conductors in India regarding the shortage of coins, which has led to delays, disputes, and financial losses. By implementing a comprehensive solution, we aim to not only improve operational efficiency and passenger satisfaction but also create a positive impact on the overall economy. Furthermore, this project seeks to foster collaboration between financial institutions, transportation authorities, and relevant stakeholders to ensure a sustainable supply of coins, thereby mitigating the recurring issue. Through the introduction of innovative technologies and streamlined processes, we aim to establish a seamless payment system that enhances the convenience and reliability of coin transactions. By doing so, we can significantly reduce disruptions, improve revenue streams, and contribute to the growth and development of the public transportation system in India.

CHAPTER-2

2.LITERATURE REVIEW

Existing solutions

i. ATM: Cash dispenser means a self-service machine which, through the use of a bank card or other means, dispenses lek banknotes to the public, debiting a bank account, such as an automated teller machine (ATM) dispensing cash



Fig 2.1: ATM

ii. BANK BRANCH AUTOMATION

Branch automation is a form of banking automation that connects the customer service desk in a bank office with the bank's customer records in the back office. Banking automation refers to the system of operating the banking process by highly automatic means so that human intervention is reduced to a minimum. Branch automation is also referred to as platform automation.

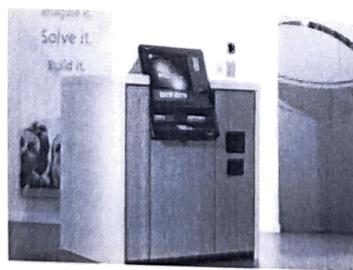


Fig 2.2: Bank Branch Automation

iii. AUTOMATIC FOREIGN CURRENCY EXCHANGE MACHINE

Currency counters are commonly used in vending machines to determine what amount of money has been deposited by customers



Fig 2.3: Automatic Foreign Currency Exchange Machine

Disadvantages of existing solutions

- i. ATM doesn't dispense coins.
- ii. ATM use fees.
- iii. The inability to withdraw cash if an ATM is broken.
- iv. Potential for robbery.
- v. Potential for having your PIN hijacked by criminals manipulating an ATM.
- vi. Limit to withdrawal.

CHAPTER-3

3.PROBLEM DEFINITION

3.1 Problem statement

A project is needed to facilitate the exchange of money notes into coins for bus conductors in India. The shortage of coins causes delays, disputes, and revenue losses. This project aims to improve efficiency, passenger satisfaction, and the economy by promoting coin circulation and ensuring a reliable payment system.

3.2 Objective

- I. To provide easy and smooth user experience i.e., can be operated by any person with minimum possible knowledge. We make it happen by writing the code which take care of the sensors in our proposed solution.
- II. This project can replace many of the devices as our device is easy to access and with a simple code.
- III. The project will be designed in such a way that, a common man use this device.

3.3 REQUIREMENT ANALYSIS

The required materials for this project are :-

1.Arduino UNO:

It is a microcontroller, which has 14 digital I/O pins, a power jack, 6 analog I/O pins, a USB connection through which input can be given. It takes input values after it is connected to a power supply and gets executed according to the program stored in it.

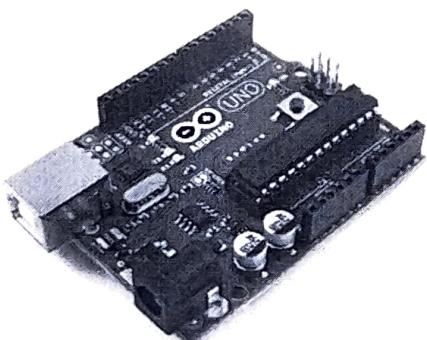


Fig 3.1 Arduino

2. Breadboard:

The connections are given on this board for proper flow of the circuit

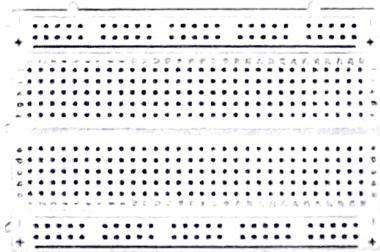


Fig 3.2: Bread board

3. Jumper Wires:

With these wires, the connections are given. This make the connection of modules to the Arduino, so that correct functioning of the project or modules takes place.

The whole project is connected using jumper wires.

i. Male-to-Male jumper wires:



Fig 3.3 Jumper wires Male-Male

ii. Male-to-Female jumper wires:

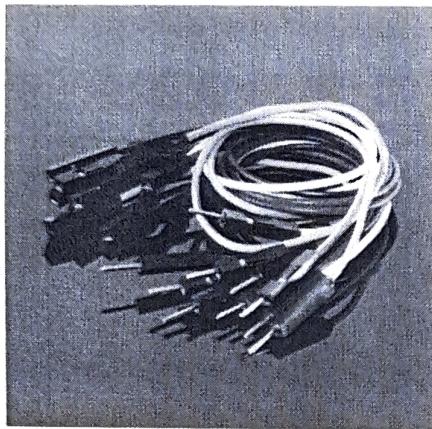


Fig 3.4 Jumper wires Male-Female

4. COLOUR SENSOR:

An electronic device that measures the distance of a target object by emitting ultrasonic sound waves, and converts the reflected sound into an electrical signal.

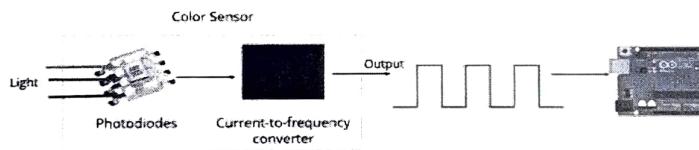


Fig 3.5 Colour Sensor

5.UV LED:

Uv led are a solid-state device that produces light when an electrical current is allowed to flow from the positive side of the circuit to the negative side. This is called the 'p-n junction'



Fig 3.6 UV LED

6.SERVO MOTOR:

A Servo motor is a type of motor that is powered by a DC source, either from an external supply or by a controller. A small and lightweight servo motor with high output power is called a micro servo motor sg90.

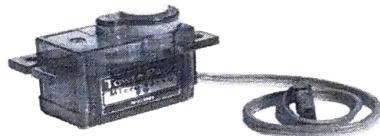


Fig 3.7 Servo Motor

CHAPTER 4

METHODOLOGY

This project is completely depends upon the code we write and the sensors we use. In the code, we write that when the sensor senses the movement of a body and the type of input it want, it displays the output on the console.

When we place this device over the projector, if there is a movement or disturbance occurred left or right side then slides change accordingly.

4.1 CONCEPTUAL DESIGN

When a currency note is inserted through the input slot, the Uv led detects its presence. The uv led emits infrared radiation, and when the note interrupts this beam, it triggers a signal to the microcontroller. Color Verification, Upon receiving the signal from the uv led, the microcontroller activates the color sensor. The color sensor analyzes the unique color pattern of the currency note to determine its authenticity. Coin Dispensing, Once the note is validated, the microcontroller sends a signal to the servo motor, instructing it to dispense two five rupee coins. The servo motor rotates, opening a coin dispensing mechanism, and releases two five rupee coins into the output tray. After dispensing the coins, the system resets to its initial state, ready to process the next currency note.

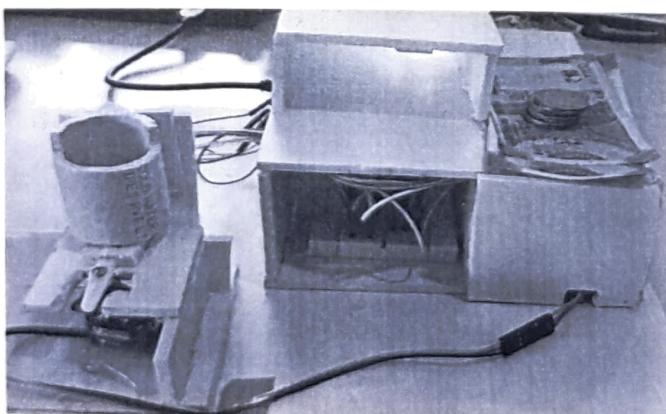
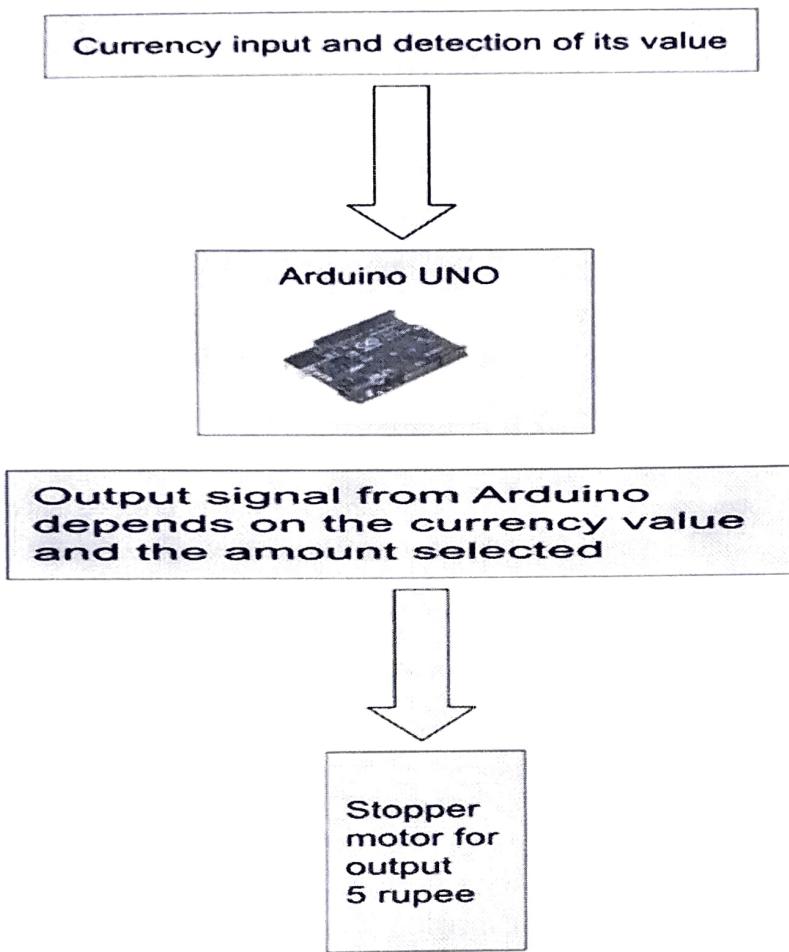


Fig 4.1 Conceptual design

4.2 BLOCK DIAGRAM:



4.3 DESIGN DESCRIPTION:

User inserts a 10 rupee note into the input slot. Uv led detects the note passing through the slot and sends a signal to the microcontroller. The microcontroller activates the color sensor to analyze the note's color pattern. The color sensor identifies the note's color pattern and sends the data back to the microcontroller. The microcontroller compares the color pattern with the known 10 rupee note pattern to validate the note. If the note is valid, the microcontroller sends a signal to the servo motor to dispense two five rupee coins. The servo motor rotates, releasing two five rupee coins into the output tray. The system resets itself, ready for the next transaction.

CHAPTER-5

5. IMPLEMENTATION

5.1 RESULTS AND DISCUSSIONS

The paper to coin system successfully demonstrates an automated currency exchange mechanism using an uv led, color sensor, and servo motor. The system accurately detects and verifies 10 rupee notes, facilitating a smooth exchange process. The use of sensors ensures reliability and reduces the chances of errors. The servo motor efficiently dispenses 2 five rupee coins for each valid note, making it a convenient and user-friendly solution. Overall, this project showcases the potential for implementing advanced technology to enhance currency exchange operations, bringing automation and precision to the process.

5.2 CONCLUSION

In conclusion, the project "**CURRENCY GAURD**" presents an innovative solution to address the challenges faced in exchanging paper currency for coins. The proposed automated system offers improved efficiency, enhanced customer experience, reduced errors, cost savings, scalability, data-driven insights, promotion of coin circulation, and environmental sustainability. By streamlining the exchange process, providing 24/7 accessibility, minimizing human errors, and promoting the use of coins, the project aims to create a reliable and convenient payment ecosystem. With its potential to optimize increase customer satisfaction, and contribute to the economy, the project holds significant promise for transforming the paper to coin currency exchange system in a positive and impactful way.

CHAPTER-6

6. APPENDIX

6.1 References

https://dspace.auk.edu.kw/bitstream/handle/11675/8035/04_Coin%20Exchange%20Machine.pdf?sequence=1&isAllowed=y

<https://www.instructables.com/How-to-Make-DIY-Coin-Counting-Bank-Using-Arduino-S/>

<https://circuitdigest.com/microcontroller-projects/arduino-currency-counter-using-ir-and-color-sensor>

Money Changer to Coins - Using Arduino / Project Guidance - Arduino Forum

<https://www.google.com/search?q=bank+branch+automation+is+like+Atm>

https://mms.businesswire.com/media/20190114005021/en/699631/5/aeskme_front_A02.jpg

<https://www.google.com/search?q=disadvantages+of+ATM>

6.2 SOURCE CODE:

```
#include <Servo.h>
```

```
int servoPin = 3;
```

```
Servo Servo1;
```

```
int rotationCounter = 0;
```

```
#define S0 4
```

```
#define S1 5
```

```
#define S2 6
```

```
#define S3 7
```

```
#define sensorOut 8
```

```
const int ledPin1 = 2;
const int ledPin2 = 3;
const int ledPin3 = 4;
const int ledPin4 = 5;
const int ledPin5 = 6;

int redPW = 0;
int greenPW = 0;
int bluePW = 0;

void setup() {
    Servo1.attach(servoPin);

    pinMode(S0, OUTPUT);
    pinMode(S1, OUTPUT);
    pinMode(S2, OUTPUT);
    pinMode(S3, OUTPUT);

    digitalWrite(S0, HIGH);
    digitalWrite(S1, LOW);

    pinMode(sensorOut, INPUT);

    pinMode(ledPin1, OUTPUT);
    pinMode(ledPin2, OUTPUT);
    pinMode(ledPin3, OUTPUT);
    pinMode(ledPin4, OUTPUT);
    pinMode(ledPin5, OUTPUT);
```

```

Serial.begin(9600);

}

void loop() {
    digitalWrite(ledPin1, HIGH);
    digitalWrite(ledPin2, HIGH);
    digitalWrite(ledPin3, HIGH);
    digitalWrite(ledPin4, HIGH);
    digitalWrite(ledPin5, HIGH);

    redPW = getRedPW();
    greenPW = getGreenPW();
    bluePW = getBluePW();

    Serial.print("Red PW = ");
    Serial.print(redPW);
    Serial.print(" - Green PW = ");
    Serial.print(greenPW);
    Serial.print(" - Blue PW = ");
    Serial.println(bluePW);

    if(rotationCounter == 0 && redPW >= 15 && redPW <= 28 && greenPW >= 24 && greenPW <= 38 && bluePW >= 20 && bluePW <= 31) {
        rotation1();
        rotationCounter = 1;
    } else if (rotationCounter == 1 && redPW >= 0 && redPW <= 5 && greenPW >= 0 && greenPW <= 5 && bluePW >= 0 && bluePW <= 5) {
        rotationx1();
        rotationCounter = 2;
    } else if (rotationCounter == 2 && redPW >= 15 && redPW <= 28 && greenPW >= 24 && greenPW <= 38 && bluePW >= 20 && bluePW <= 31)
    {
        rotation2();
    }
}

```

```
rotationCounter = 3;

} else if (rotationCounter == 3 && redPW >= 0 && redPW <= 5 && greenPW >= 0 && greenPW <= 5 && bluePW >= 0 && bluePW <= 5) {

    rotationx2();

    rotationCounter = 4;

} else if (rotationCounter == 4 && redPW >= 15 && redPW <= 28 && greenPW >= 24 && greenPW <= 38 && bluePW >= 20 && bluePW <= 31) {

    rotation3();

    rotationCounter = 5;

} else if (rotationCounter == 5 && redPW >= 0 && redPW <= 5 && greenPW >= 0 && greenPW <= 5 && bluePW >= 0 && bluePW <= 5) {

    rotationx3();

    rotationCounter = 6;

} else if (rotationCounter == 6 && redPW >= 15 && redPW <= 28 && greenPW >= 24 && greenPW <= 38 && bluePW >= 20 && bluePW <= 31) {

    rotation4();

    rotationCounter = 7;

} else if (rotationCounter == 7 && redPW >= 0 && redPW <= 5 && greenPW >= 0 && greenPW <= 5 && bluePW >= 0 && bluePW <= 5) {

    rotationx4();

    rotationCounter = 8;

} else if (rotationCounter == 8 && redPW >= 15 && redPW <= 28 && greenPW >= 24 && greenPW <= 38 && bluePW >= 20 && bluePW <= 31) {

    rotation5();

    rotationCounter = 9;

} else if (rotationCounter == 9 && redPW >= 0 && redPW <= 5 && greenPW >= 0 && greenPW <= 5 && bluePW >= 0 && bluePW <= 5) {

    rotationx5();

    rotationCounter = 10;

} else if (rotationCounter == 10 && redPW >= 15 && redPW <= 28 && greenPW >= 24 && greenPW <= 38 && bluePW >= 20 && bluePW <= 31) {

    rotation6();

    rotationCounter = 11;

} else if (rotationCounter == 11 && redPW >= 0 && redPW <= 5 && greenPW >= 0 && greenPW <= 5 && bluePW >= 0 && bluePW <= 5) {

    rotationx6();
```

```

rotationCounter = 12;

} else if (rotationCounter == 12 && redPW >= 15 && redPW <= 28 && greenPW >= 24 && greenPW <= 38 && bluePW >= 20 && bluePW <= 31)
{

rotation7();

rotationCounter = 13;

} else if (rotationCounter == 13 && redPW >= 0 && redPW <= 5 && greenPW >= 0 && greenPW <= 5 && bluePW >= 0 && bluePW <= 5) {

rotationx7();

rotationCounter = 14;

} else if (rotationCounter == 14 && redPW >= 15 && redPW <= 28 && greenPW >= 24 && greenPW <= 38 && bluePW >= 20 && bluePW <= 31)
{

rotation8();

rotationCounter = 15;

} else if (rotationCounter == 15 && redPW >= 0 && redPW <= 5 && greenPW >= 0 && greenPW <= 5 && bluePW >= 0 && bluePW <= 5) {

rotationx8();

rotationCounter = 16;

} else if (rotationCounter == 16 && redPW >= 15 && redPW <= 28 && greenPW >= 24 && greenPW <= 38 && bluePW >= 20 && bluePW <= 31)
{

rotation9();

rotationCounter = 17;

} else if (rotationCounter == 17 && redPW >= 0 && redPW <= 5 && greenPW >= 0 && greenPW <= 5 && bluePW >= 0 && bluePW <= 5) {

rotationx9();

rotationCounter = 18;

} else if (rotationCounter == 18 && redPW >= 15 && redPW <= 28 && greenPW >= 24 && greenPW <= 38 && bluePW >= 20 && bluePW <= 31)
{

rotation10();

rotationCounter = 19;

} else if (rotationCounter == 19 && redPW >= 0 && redPW <= 5 && greenPW >= 0 && greenPW <= 5 && bluePW >= 0 && bluePW <= 5) {

rotationx10();

rotationCounter = 20;

} else if (rotationCounter == 20 && redPW >= 15 && redPW <= 28 && greenPW >= 24 && greenPW <= 38 && bluePW >= 20 && bluePW <= 31)
{

rotation11();

```

```

rotationCounter = 21;

} else if (rotationCounter == 21 && redPW >= 0 && redPW <= 5 && greenPW >= 0 && greenPW <= 5 && bluePW >= 0 && bluePW <= 5) {

    rotationx11();

    rotationCounter = 22;

} else if (rotationCounter == 22 && redPW >= 15 && redPW <= 28 && greenPW >= 24 && greenPW <= 38 && bluePW >= 20 && bluePW <= 31)

{

    rotation12();

    rotationCounter = 23;

} else if (rotationCounter == 23 && redPW >= 0 && redPW <= 5 && greenPW >= 0 && greenPW <= 5 && bluePW >= 0 && bluePW <= 5) {

    rotationx12();

    rotationCounter = 24;

} else if (rotationCounter == 24 && redPW >= 15 && redPW <= 28 && greenPW >= 24 && greenPW <= 38 && bluePW >= 20 && bluePW <= 31)

{

    rotation13();

    rotationCounter = 25;

} else if (rotationCounter == 25 && redPW >= 0 && redPW <= 5 && greenPW >= 0 && greenPW <= 5 && bluePW >= 0 && bluePW <= 5) {

    rotationx13();

    rotationCounter = 26;

} else if (rotationCounter == 26 && redPW >= 15 && redPW <= 28 && greenPW >= 24 && greenPW <= 38 && bluePW >= 20 && bluePW <= 31)

{

    rotation14();

    rotationCounter = 27;

} else if (rotationCounter == 27 && redPW >= 0 && redPW <= 5 && greenPW >= 0 && greenPW <= 5 && bluePW >= 0 && bluePW <= 5) {

    rotationx14();

    rotationCounter = 28;

} else if (rotationCounter == 28 && redPW >= 15 && redPW <= 28 && greenPW >= 24 && greenPW <= 38 && bluePW >= 20 && bluePW <= 31)

{

    rotation15();

    rotationCounter = 29;

} else if (rotationCounter == 29 && redPW >= 0 && redPW <= 5 && greenPW >= 0 && greenPW <= 5 && bluePW >= 0 && bluePW <= 5) {

    rotationx15();

```

```
rotationCounter = 30;

} else if (rotationCounter == 30 && redPW >= 15 && redPW <= 28 && greenPW >= 24 && greenPW <= 38 && bluePW >= 20 && bluePW <= 31) {
    rotation16();

    rotationCounter = 31;

} else if (rotationCounter == 31 && redPW >= 0 && redPW <= 5 && greenPW >= 0 && greenPW <= 5 && bluePW >= 0 && bluePW <= 5) {
    rotationx16();

    rotationCounter = 32;

}

delay(1000);

}

void rotation1() {
    Servo1.write(0);

    delay(1000);

    Servo1.write(180);

    delay(1000);

}

void rotationx1() {
    Servo1.write(180);

    delay(1000);

}

void rotation2() {
    Servo1.write(180);

    delay(1000);

    Servo1.write(0);

    delay(1000);

}
```

```
void rotationx2() {
```

```
    Servo1.write(0);
```

```
    delay(1000);
```

```
}
```

```
void rotation3() {
```

```
    Servo1.write(0);
```

```
    delay(1000);
```

```
    Servo1.write(180);
```

```
    delay(1000);
```

```
}
```

```
void rotationx3() {
```

```
    Servo1.write(180);
```

```
    delay(1000);
```

```
}
```

```
void rotation4() {
```

```
    Servo1.write(180);
```

```
    delay(1000);
```

```
    Servo1.write(0);
```

```
    delay(1000);
```

```
}
```

```
void rotationx4() {
```

```
    Servo1.write(0);
```

```
    delay(1000);
```

```
}
```

```
void rotation5() {
```

```
    Servo1.write(0);
```

```
    delay(1000);
```

```
    Servo1.write(180);
```

```
    delay(1000);
```

```
}
```

```
void rotationx5() {
```

```
    Servo1.write(180);
```

```
    delay(1000);
```

```
}
```

```
void rotation6() {
```

```
    Servo1.write(180);
```

```
    delay(1000);
```

```
    Servo1.write(0);
```

```
    delay(1000);
```

```
}
```

```
void rotationx6() {
```

```
    Servo1.write(0);
```

```
    delay(1000);
```

```
}
```

```
void rotation7() {
```

```
    Servo1.write(0);
```

```
    delay(1000);
```

```
    Servo1.write(180);
```

```
delay(1000);

}

void rotationx7() {
    Servo1.write(180);
    delay(1000);
}

void rotation8() {
    Servo1.write(180);
    delay(1000);
    Servo1.write(0);
    delay(1000);
}

void rotationx8() {
    Servo1.write(0);
    delay(1000);
}

void rotation9() {
    Servo1.write(0);
    delay(1000);
    Servo1.write(180);
    delay(1000);
}

void rotationx9() {
    Servo1.write(180);
}
```

```
delay(1000);

}

void rotation10() {
    Servo1.write(180);
    delay(1000);
    Servo1.write(0);
    delay(1000);
}

void rotationx10() {
    Servo1.write(0);
    delay(1000);
}

void rotation11() {
    Servo1.write(0);
    delay(1000);
    Servo1.write(180);
    delay(1000);
}

void rotationx11() {
    Servo1.write(180);
    delay(1000);
}

void rotation12() {
    Servo1.write(180);
```

```
delay(1000);

Servo1.write(0);

delay(1000);

}
```

```
void rotationx12() {

Servo1.write(0);

delay(1000);

}
```

```
void rotation13() {

Servo1.write(0);

delay(1000);

Servo1.write(180);

delay(1000);

}


```

```
void rotationx13() {

Servo1.write(180);

delay(1000);

}


```

```
void rotation14() {

Servo1.write(180);

delay(1000);

Servo1.write(0);

delay(1000);

}
```

```
void rotationx14() {
```

```
    Servo1.write(0);
```

```
    delay(1000);
```

```
}
```

```
void rotation15() {
```

```
    Servo1.write(0);
```

```
    delay(1000);
```

```
    Servo1.write(180);
```

```
    delay(1000);
```

```
}
```

```
void rotationx15() {
```

```
    Servo1.write(180);
```

```
    delay(1000);
```

```
}
```

```
void rotation16() {
```

```
    Servo1.write(180);
```

```
    delay(1000);
```

```
    Servo1.write(0);
```

```
    delay(1000);
```

```
}
```

```
void rotationx16() {
```

```
    Servo1.write(0);
```

```
    delay(1000);
```

```
}
```

```
int getRedPW() {  
  
    digitalWrite(S2, LOW);  
  
    digitalWrite(S3, LOW);  
  
    int PW;  
  
    PW = pulseIn(sensorOut, LOW);  
  
    return PW;  
  
}
```

```
int getGreenPW() {  
  
    digitalWrite(S2, HIGH);  
  
    digitalWrite(S3, HIGH);  
  
    int PW;  
  
    PW = pulseIn(sensorOut, LOW);  
  
    return PW;  
  
}
```

```
int getBluePW() {  
  
    digitalWrite(S2, LOW);  
  
    digitalWrite(S3, HIGH);  
  
    int PW;  
  
    PW = pulseIn(sensorOut, LOW);  
  
    return PW;  
  
}
```

CHAPTER 7

TEAM DETAILS

PHOTO	NAME	ROLL NUMBER
	B.RAHUL KUMAR	22H51A6673
	CH.SATHVIKA	22H51A6674
	DARSHAN	22H51A6676
	K.HARSHITHA	22H51A6693
	M.DEEKSHIT	22H51A66A2

TEAM PHOTO

