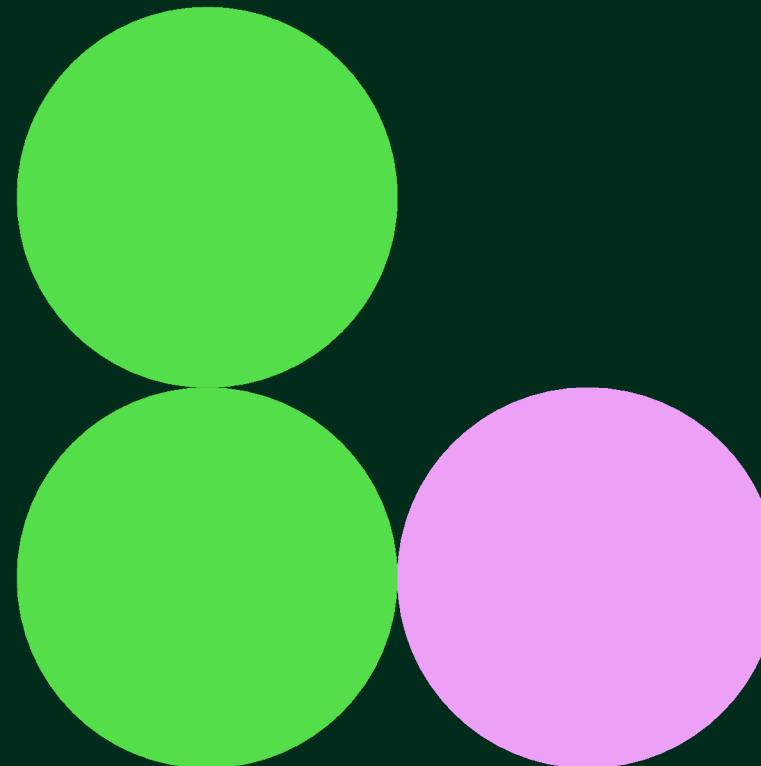


# Water Management System For Smart Cities

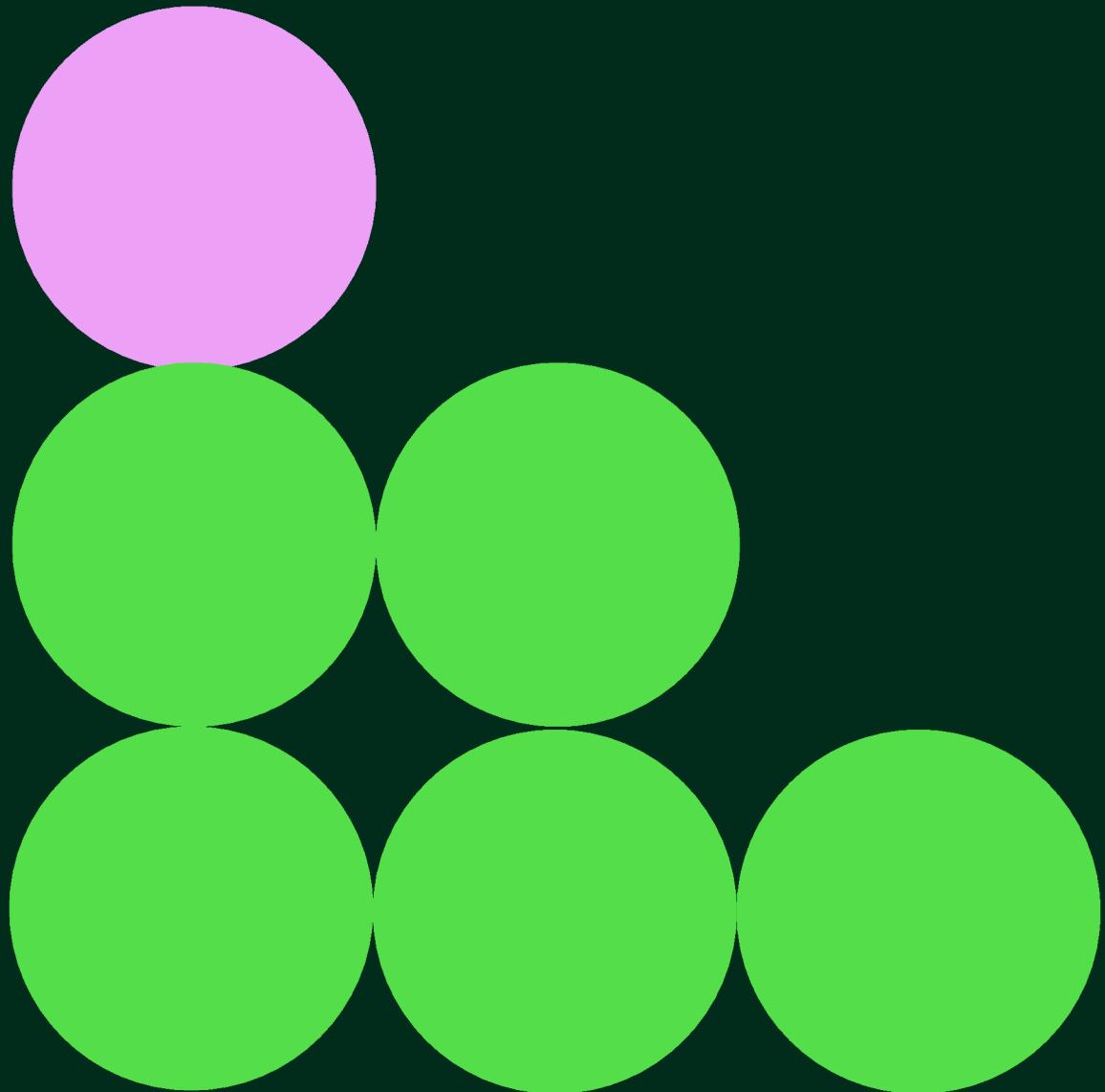
# Problem Statement



Develop a prototype of a Water Management System for smart cities. This system will

- (i) track water usage in residential and commercial areas
- (ii) detect leaks and ensure efficient water distribution in real-time
- (iii) process the data and provide access through a cloud platform

# Made By



Danishbir Sidhu

2310996771

Ashutosh Sharma

2310996773

Karamjit Chechi

2310996774

Brahmveer Singh

2310996775

# Key Components For Project

01

## Arduino Uno

The Arduino Uno is an open-source microcontroller board.

02

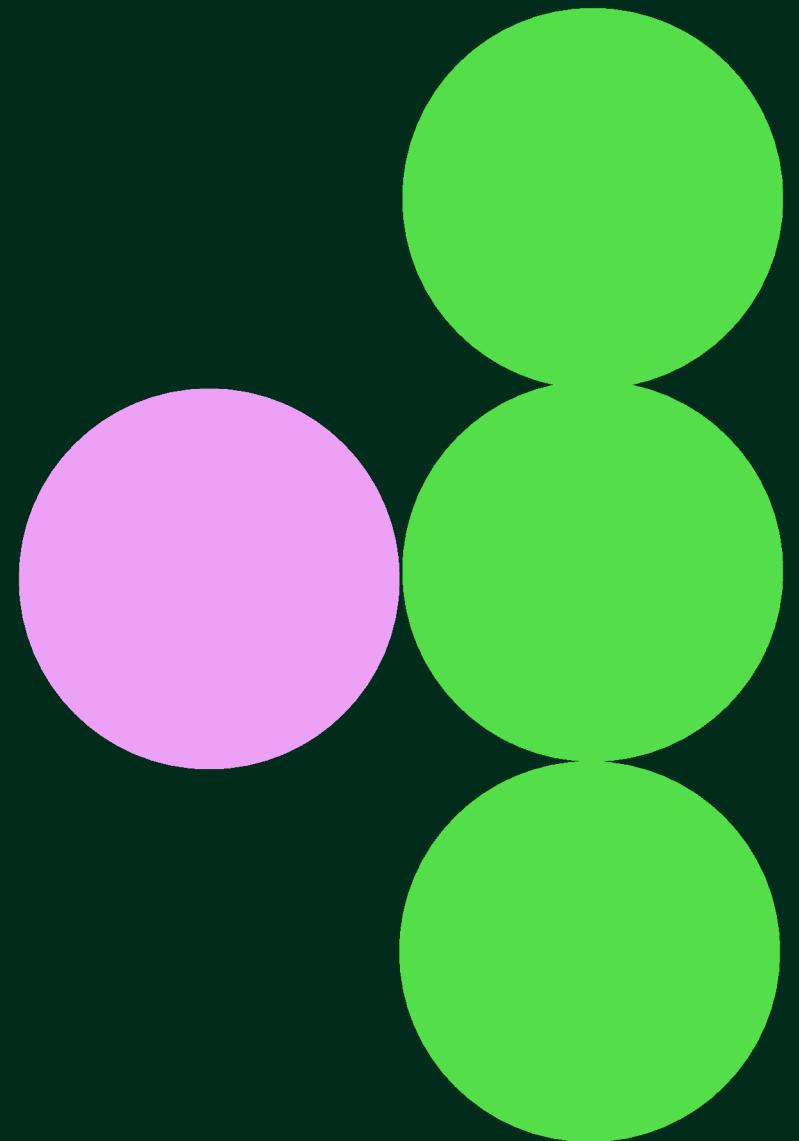
## Float Sensor

A float sensor is used to detect the presence or absence of water.

03

## ESP8266 WiFi

The ESP8266 is a low-cost WiFi module that allows the Arduino to connect to the internet.



# Key Components For Project

04

## Buzzer

A buzzer is a simple output device used for generating audible alerts.

05

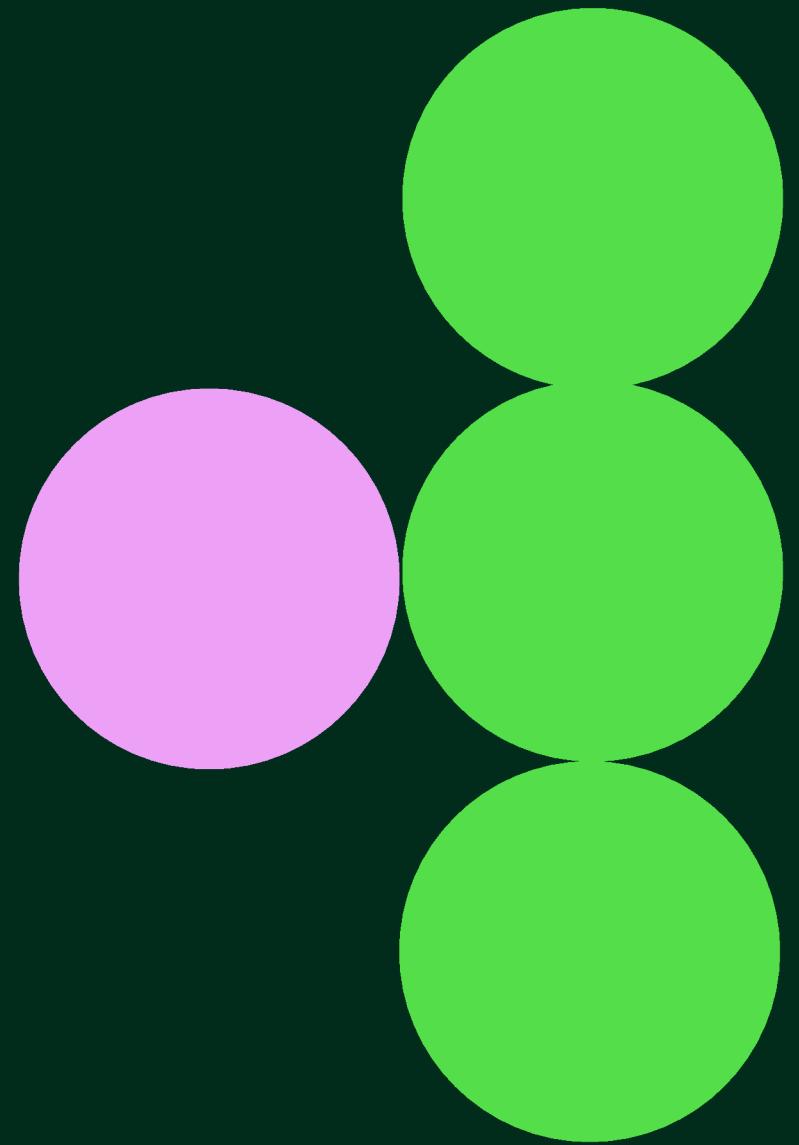
## Breadboard

A breadboard is a prototyping board that allows you to build and test circuits without soldering.

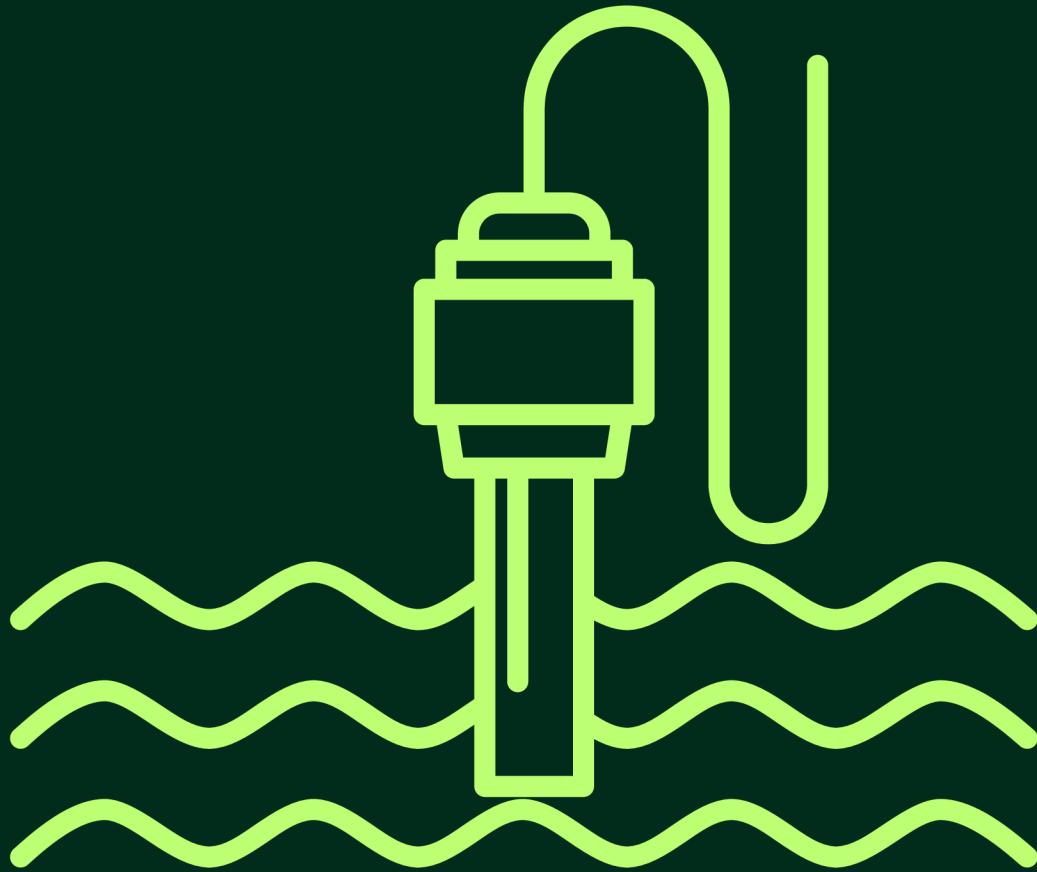
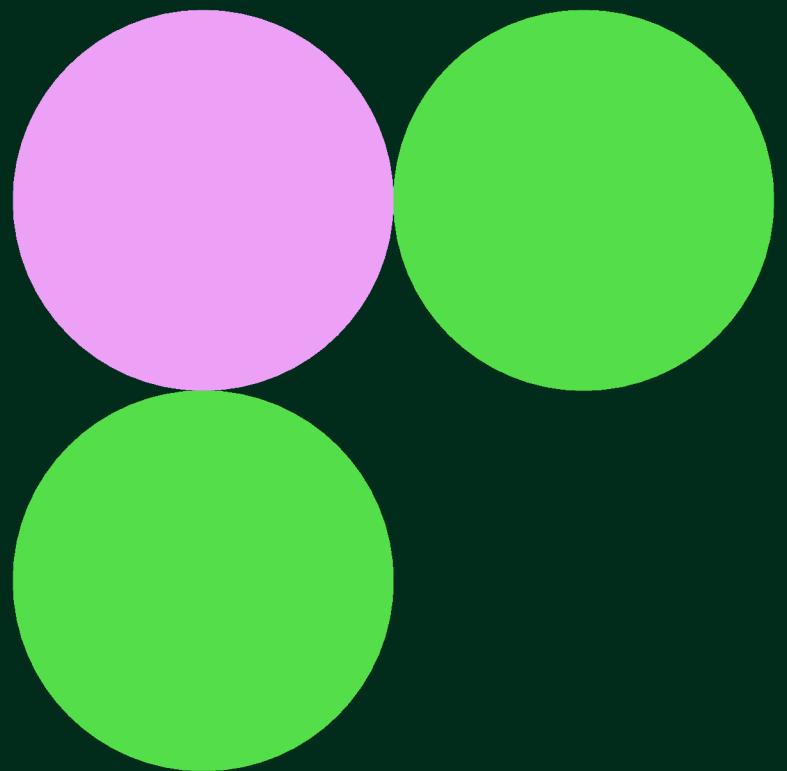
06

## Jumper Wires

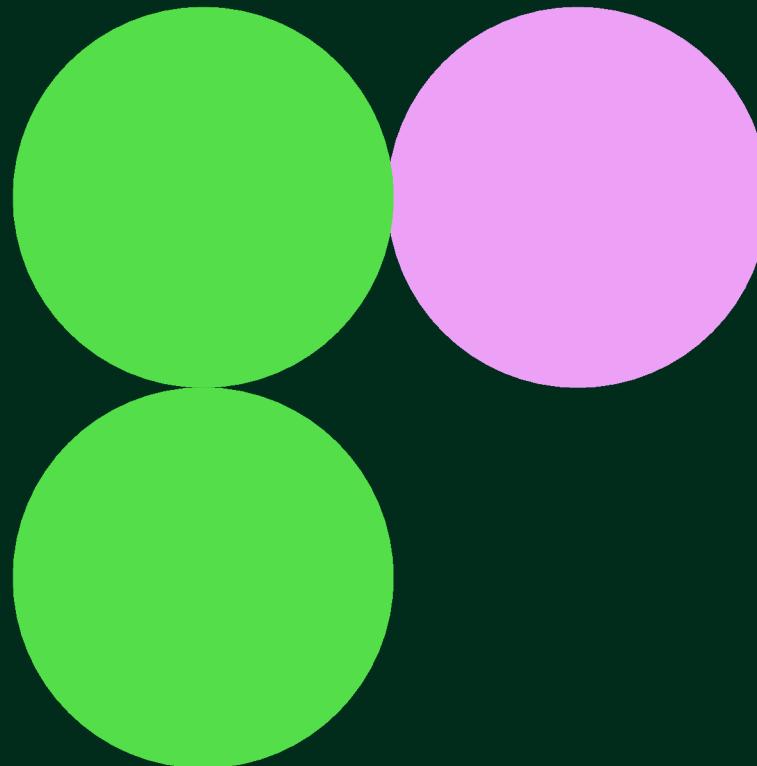
Jumper wires are used to connect components on the breadboard to the Arduino and other parts of the circuit.



# Connections



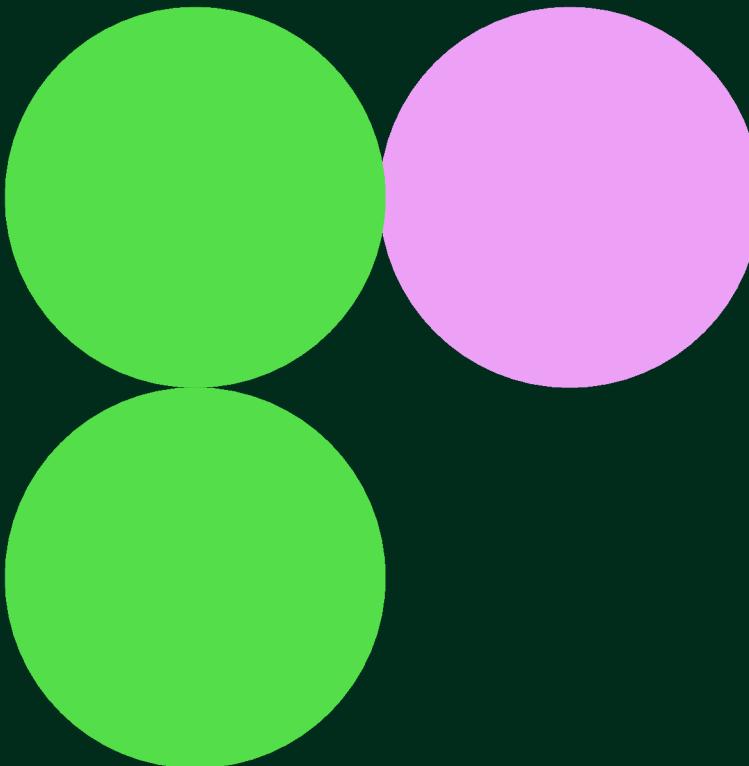
# Connections



## 1. Float Sensor

- VCC to Arduino 5V
- GND to Arduino GND
- Signal to Arduino Digital Pin 2

# Connections

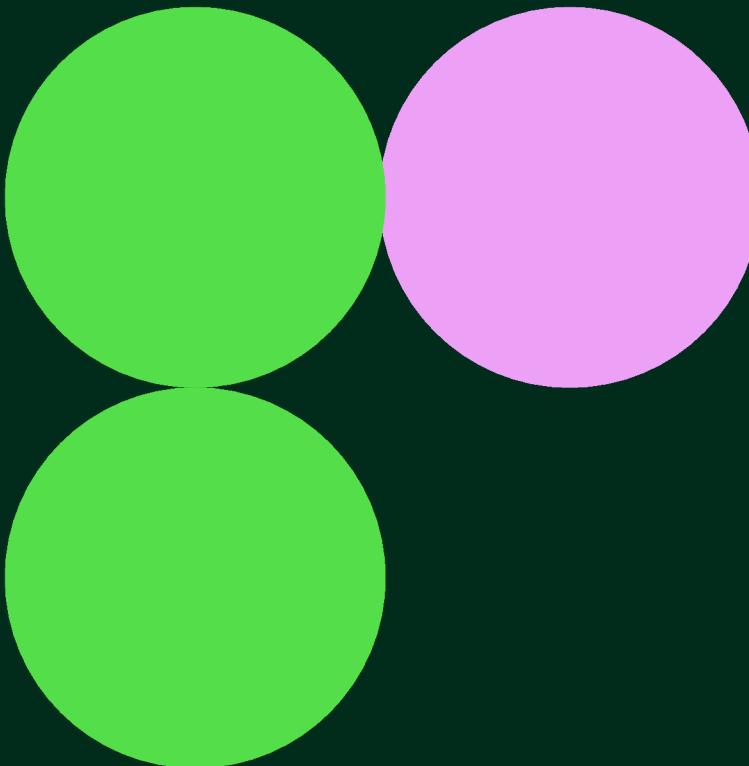


## 2. ESP8266 WiFi Module

- VCC to Arduino 3.3V
- GND to Arduino GND
- RX to Arduino Digital Pin 11 (Software Serial TX)
- TX to Arduino Digital Pin 10 (Software Serial RX)



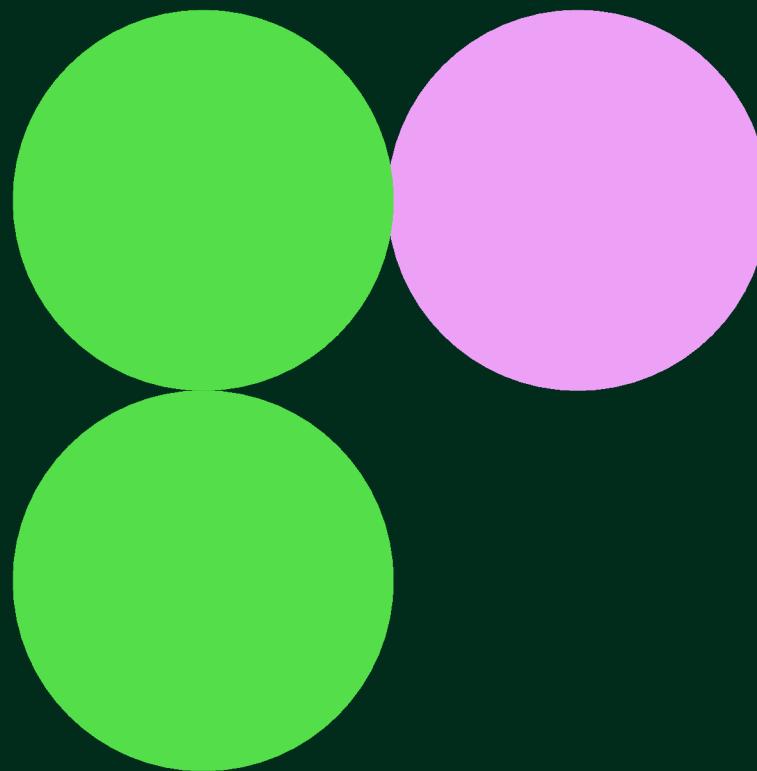
# Connections



## 3. Buzzer

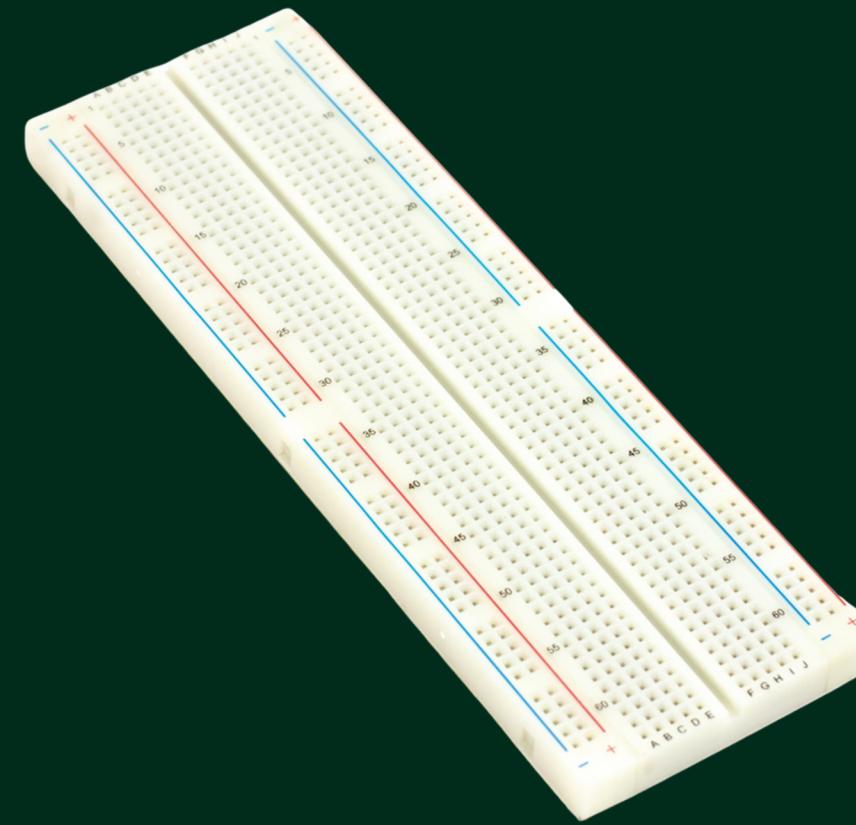
- Positive (longer leg) to Arduino Digital Pin 3
- Negative (shorter leg) to Arduino GND

# Connections

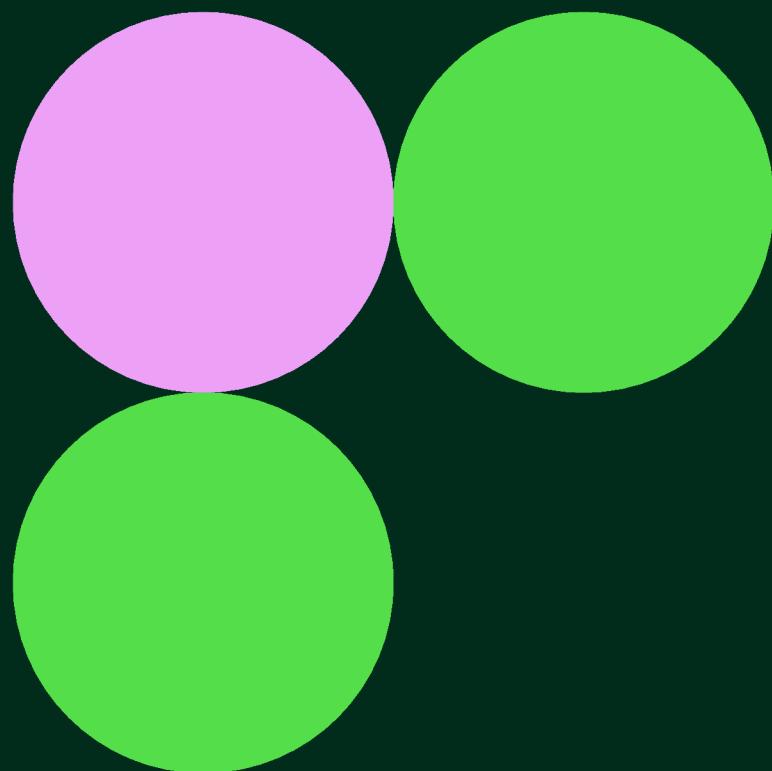
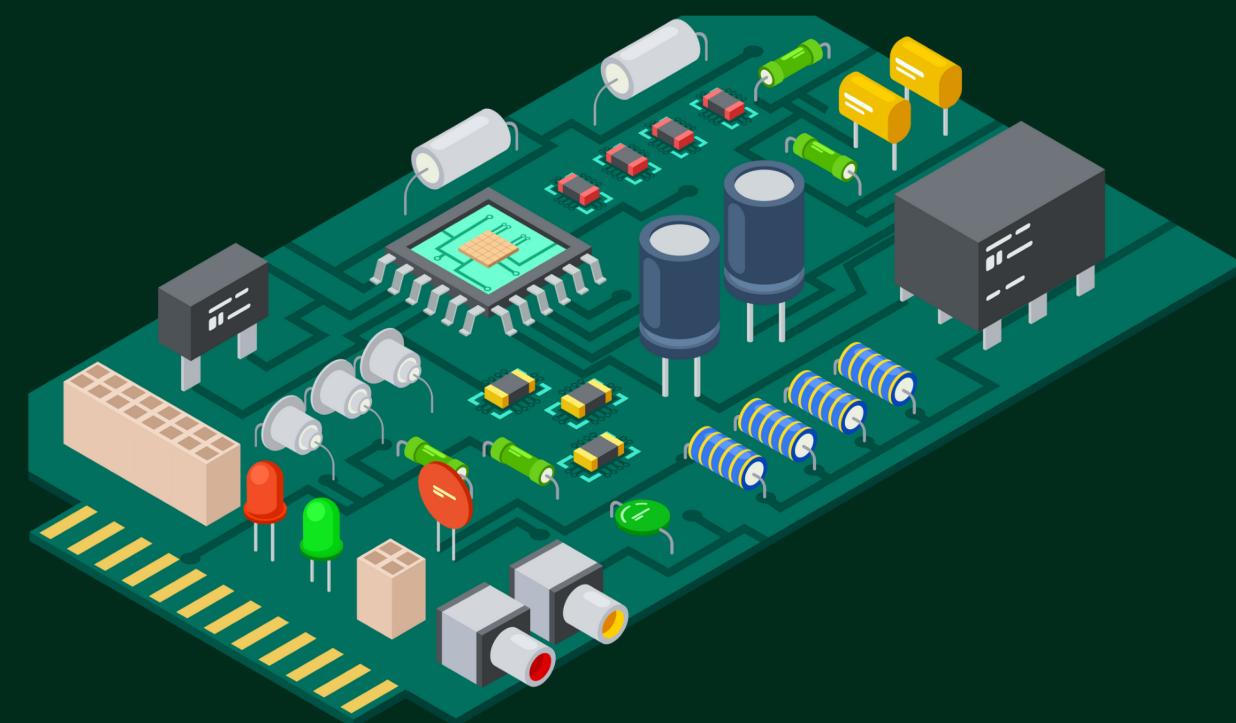


## 4. Breadboard

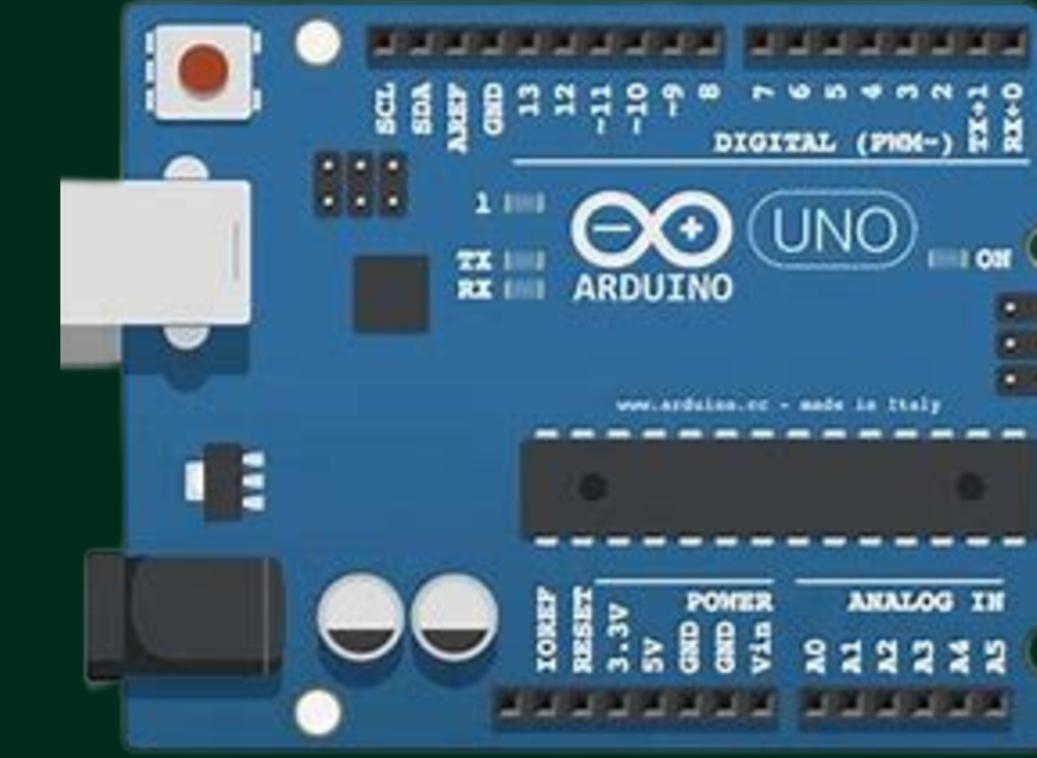
- Use the breadboard and jumper wires to make these connections.



# Component Overview

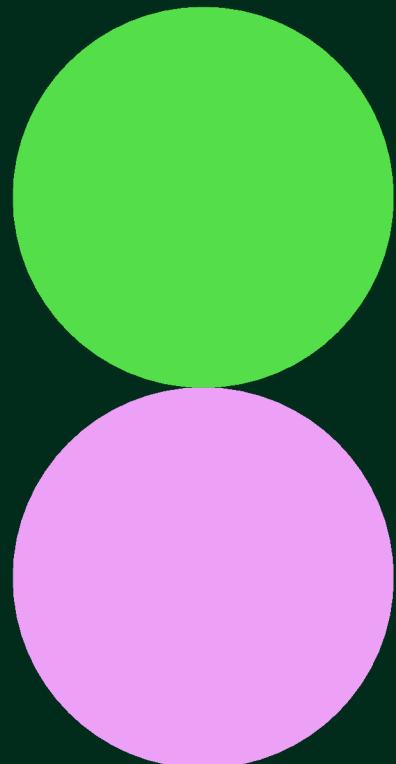


# Component Overview



- The Arduino Uno is an open-source microcontroller board based on the Microchip ATmega328P microcontroller. It is one of the most widely used and documented Arduino boards.
- Key features include:
  - 14 digital I/O pins (6 of which can be used for PWM output)
  - 6 analog I/O pins
  - USB interface for programming and power
  - Automatic power source selection between USB and external DC power (7-20V)
  - ICSP header for direct programming
  - On-board LED and reset button.
- Versatile and widely available. Alternatives like Raspberry Pi would be overkill for this simple prototype

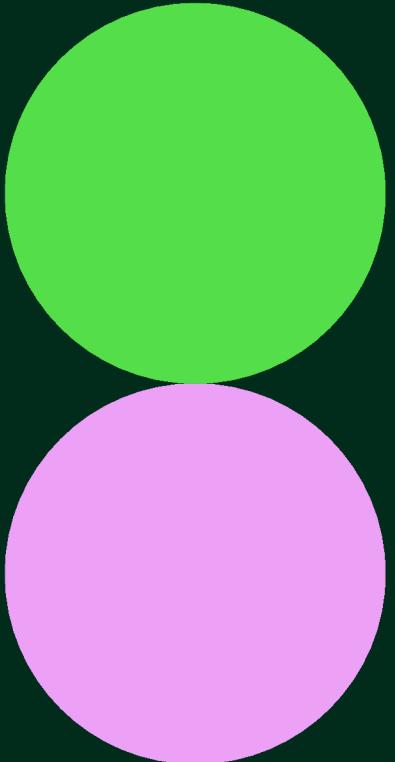
# Component Overview



- A float sensor is used to detect the presence or absence of water.
- It is typically connected to a digital input pin on the Arduino.
- When the water level is high enough to trigger the sensor, it sends a signal to the Arduino, which can then take appropriate actions such as triggering the buzzer or sending data via the ESP8266
- Simple and reliable for detecting water presence. Alternatives like ultrasonic sensors could be more precise but are more complex and expensive.



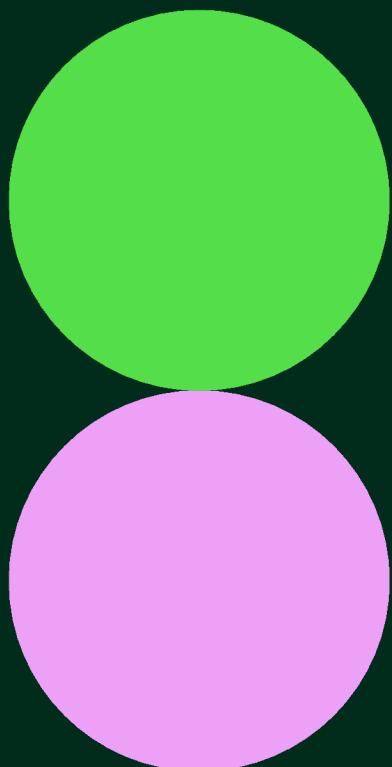
# Component Overview



- The ESP8266 is a low-cost WiFi module that allows the Arduino to connect to the internet.
- It communicates with the Arduino using serial communication (UART) and can send data to cloud platforms like ThingSpeak.
- Key features include WiFi capability, support for TCP/IP protocols, and low power consumption.
- Inexpensive and widely supported for IoT applications. It's more suitable for this project than alternatives like Ethernet shields due to its wireless capability and lower power consumption.



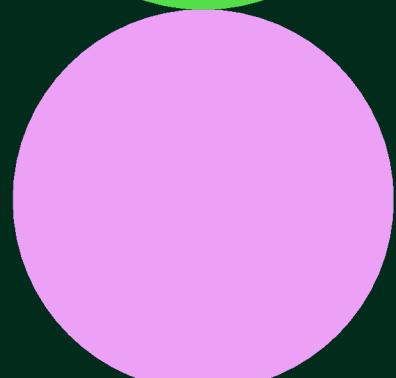
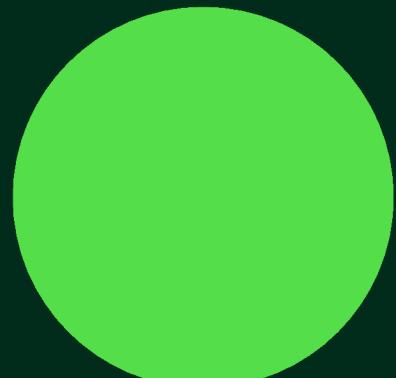
# Component Overview



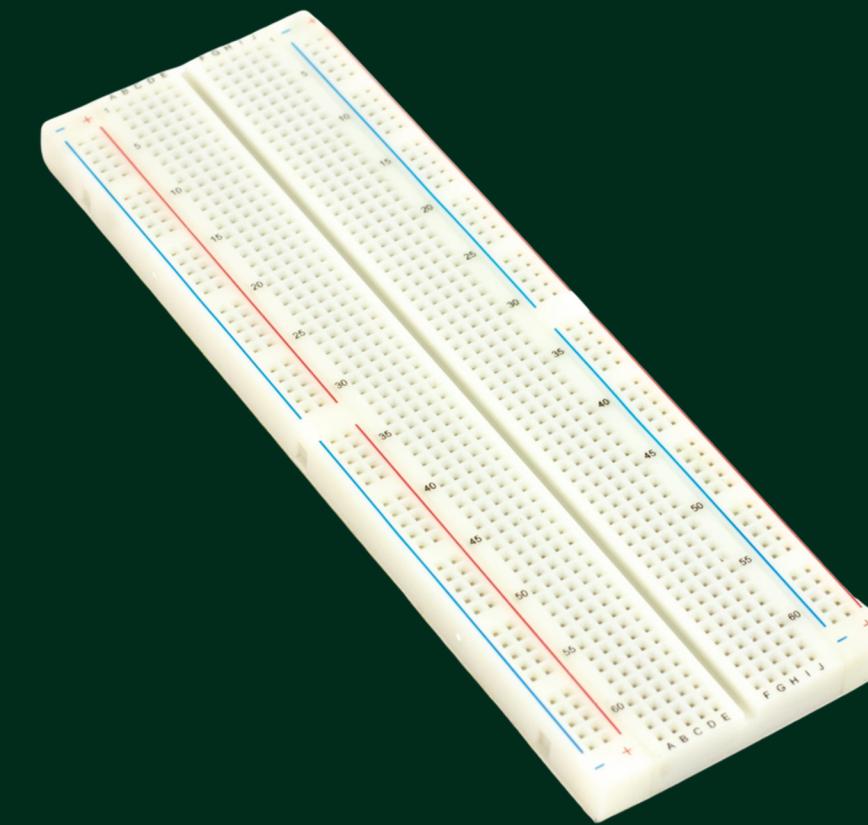
- A buzzer is a simple output device used for generating audible alerts.
- It is connected to a digital output pin on the Arduino and can be activated when certain conditions are met, such as detecting a high water level or a potential leak.
- The buzzer operates on the voltage provided by the Arduino and can be controlled using digital write functions.
- Simple and effective for local alerts. Alternatives like LEDs would be less noticeable in a water management scenario.



# Component Overview



- A breadboard is a prototyping board that allows you to build and test circuits without soldering.
- Jumper wires are used to connect components on the breadboard to the Arduino and other parts of the circuit.
- They provide a flexible and temporary connection method, ideal for prototyping and testing.



# Code

```
/ Define the pins for the float sensor and the buzzer
int floatSensorPin = 2;
int buzzerPin = 3;

void setup() {
    // Set the float sensor pin as input
    pinMode(floatSensorPin, INPUT);

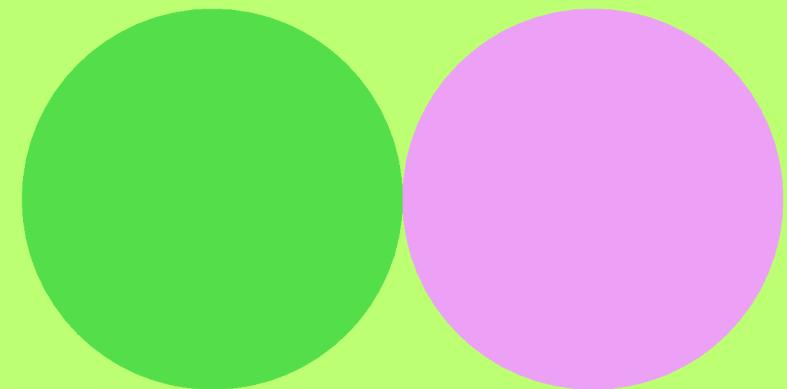
    // Set the buzzer pin as output
    pinMode(buzzerPin, OUTPUT);

    // Start the serial communication
    Serial.begin(9600);
}
```

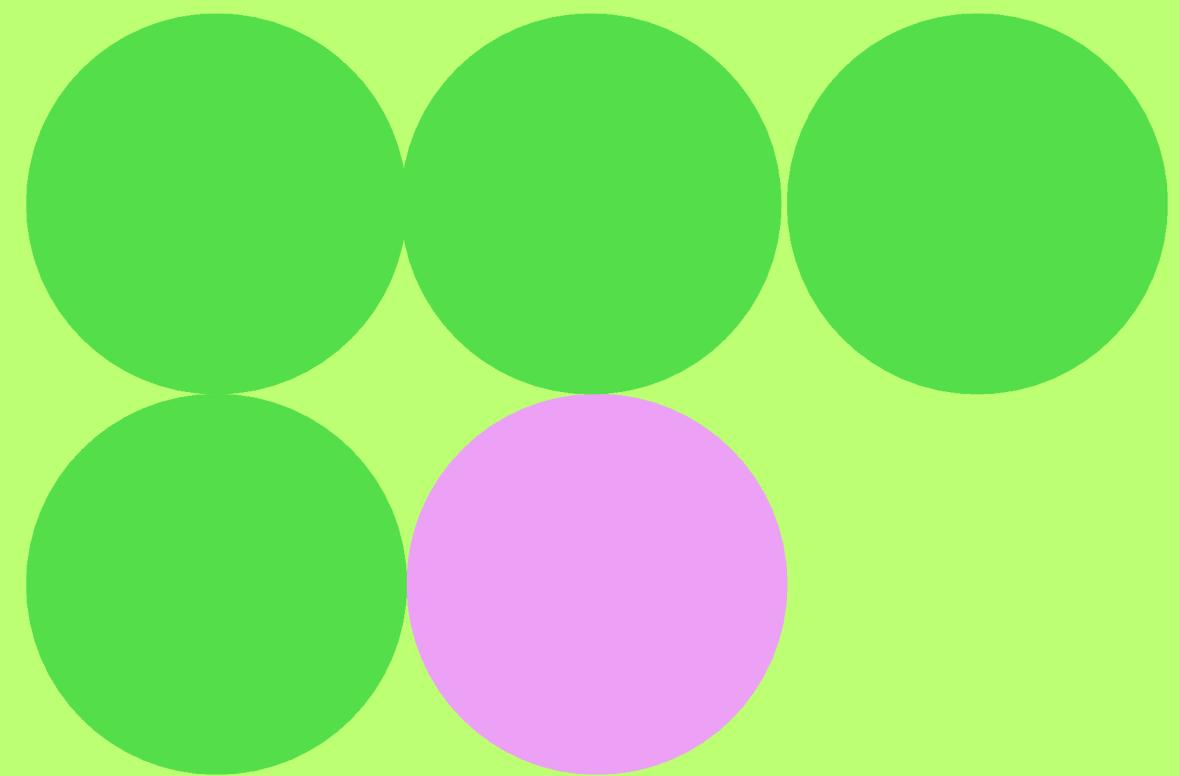
```
void loop() {
    // Read the state of the float sensor
    int floatSensorState = digitalRead(floatSensorPin);

    // Check if the float sensor is triggered
    if (floatSensorState == HIGH) {
        // Turn on the buzzer
        digitalWrite(buzzerPin, HIGH);
        Serial.println("Float sensor triggered!");
    } else {
        // Turn off the buzzer
        digitalWrite(buzzerPin, LOW);
        Serial.println("Float sensor not triggered.");
    }
}
```

# Output



# Have a question?



# Our Team



Danishbir  
Sidhu

2310996771



Ashutosh  
Sharma

2310996773



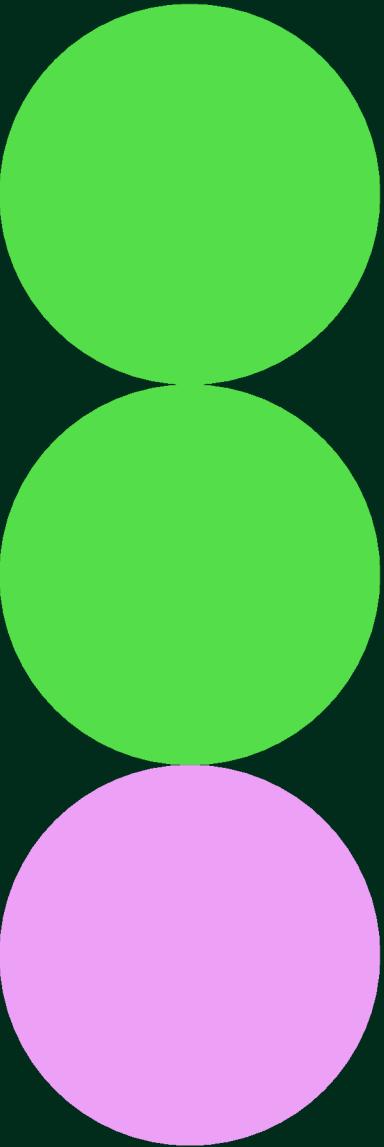
Karamjit  
Chechi

2310996774



Brahmveer  
Singh

2310996775



# Thank you.

