

COCHIN UNIVERSITY OF SCIENCE AND TECHNOLOGY



MINI PROJECT REPORT

ON

WATER MONITORING AND WARNING SYSTEM

Submitted in partial fulfillment of the award of the degree of

Bachelor of Technology

in

ELECTRONICS AND COMMUNICATION ENGINEERING

at

**COCHIN UNIVERSITY COLLEGE OF ENGINEERING
KUTTANAD**

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CERTIFICATE

This is to certify that the project report entitled “WATER MONITORING AND WARNING SYSTEM ” has been submitted by BHANU PRATAP SINGH (20318511), CHANDAN KUMAR THAKUR(20318512), VIVEK KUMAR(20318540), ANAND KUMAR(20318505) in partial fulfillment of the requirements for the award of the degree B.Tech in ELECTRONICS & COMMUNICATION ENGINEERING of COCHIN UNIVERSITY OF SCIENCE AND TECHNOLOGY.

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ABSTRACT

IoT has made a major impact on the world. With the IoT we are able to collect and transfer data without human intervention. We have made the project using wifi module esp8266 along with some circuits. We can implement this circuit in many ways .we have shown one example using boat. If the water enters the boat then the control room will get notification on their phone and they can take necessary action and if water level rises further and enters into another level then passenger will hear the buzzer sound and they will become alert.

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1. INTRODUCTION

1.1 AIM & OBJECTIVE

Our aim is to construct a system in which we will get the notification message in the smart phone when water enters into the boat and if the water level increases we will get the beeping sound of buzzer.

1.2 PURPOSE

The purpose of this project is to generate a small boat like model in which there will be two levels, we will place different circuits on both levels. If water enters into level 1 we will get the notification on mobile and if water enters into level 2 we will hear buzzer sound.

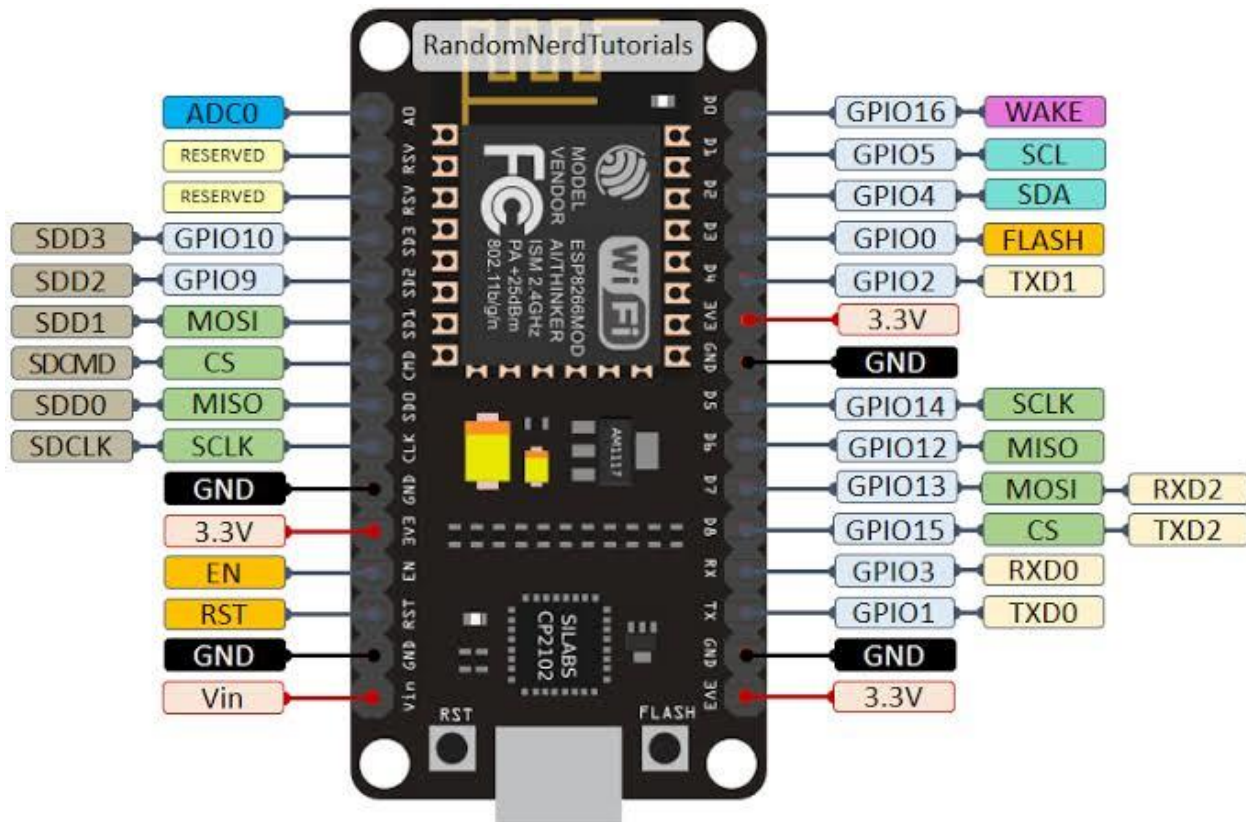
1.3 SCOPE

We know that IoT technologies are increasing day to day and becoming part of our life. In future we can see use of IoT for many purposes. This technology can be used in submarines by navy. It can be used in passenger boats for saving lives. In the hazardous situation chaos can be handled by using this as passenger will become alert and will get enough time for evacuation and can ask for help.

2. COMPONENTS REQUIRED

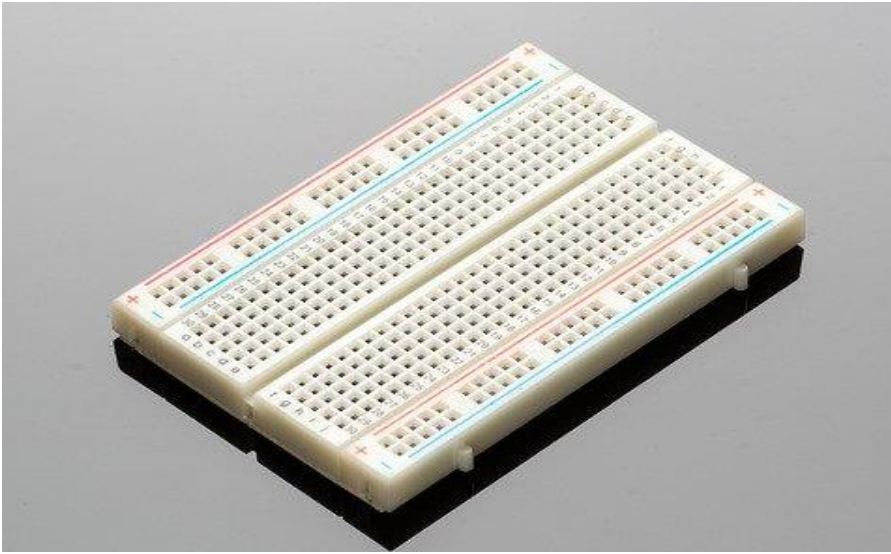
2.1 ESP8266

The **ESP8266** is a *low cost* Wi-Fi **microchip** and can be controlled by local Wi-Fi or internet with a full TCP/IP stack and microcontroller capability. It can be programmed by using Arduino IDE.



2.2 BREADBOARD

A **breadboard** is a solderless device for temporary prototype with electronics and test circuit designs. Most electronic components in electronic circuits can be interconnected by inserting their leads or terminals into the holes and then making connections throughwires where appropriate.



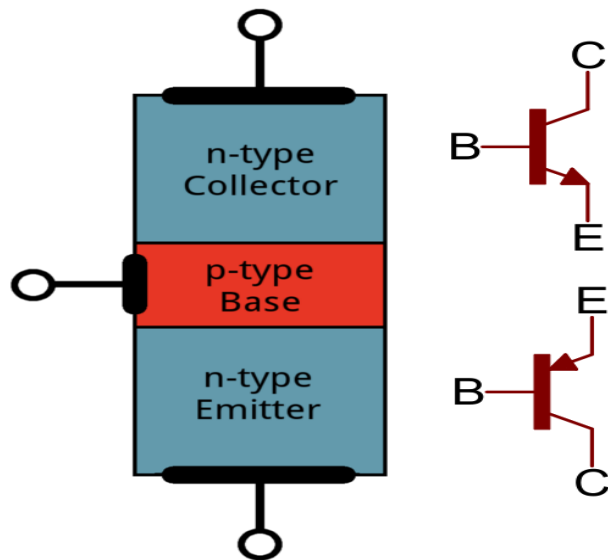
2.3 LED

A **light-emitting diode (LED)** is a semiconductor light source that emits light when current flows through it. Electrons in the semiconductor recombine with electron holes, releasing energy in the form of photons.



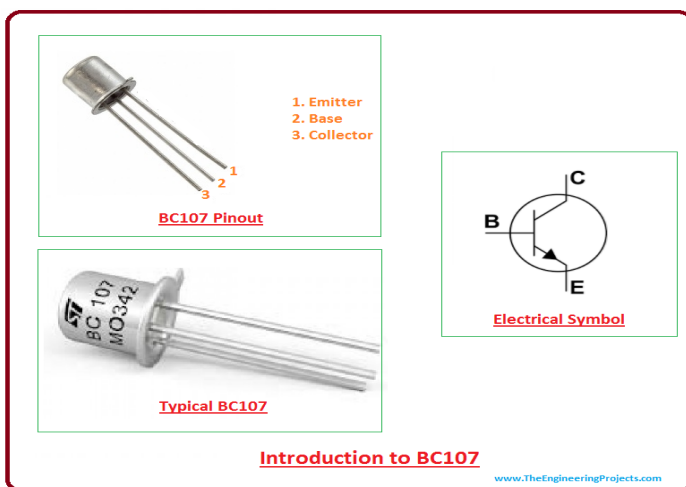
2.4 TRANSISTOR

A **transistor** is a semiconductor device used to amplify or switch electronic signals and electrical power. **Transistors** are one of the basic building blocks of modern electronics. It is composed of semiconductor material usually with at least three terminals for connection to an external circuit. In this project we are using BC107 and BC547 transistor.



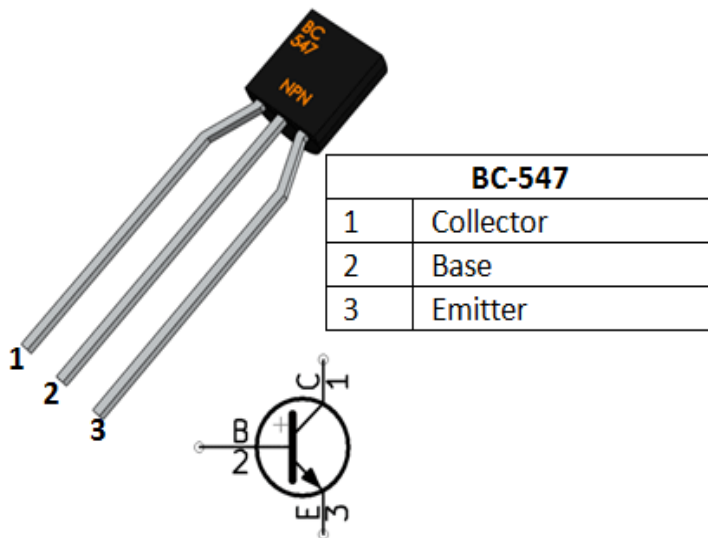
2.4.1 BC107

- **BC107** is an NPN bipolar planar low power transistor which is mainly designed for general purpose switching and amplification purpose.
- It is mainly composed of three terminals named as an emitter, base, and collector.
- Being a current controlled device, small current at the base side is used to control large current at the emitter and collector side.
- When a voltage is applied at the base terminal, it gets biased and draws current and starts controlling large current at the emitter and collector side.



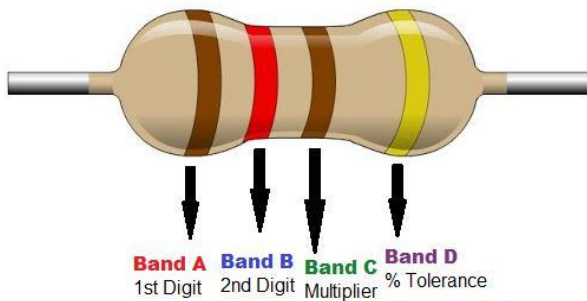
2.4.2 BC547

BC547 is a **NPN transistor** hence the collector and emitter will be left open (Reverse biased) when the base pin is held at ground and will be closed (Forward biased) when a signal is provided to base pin. BC547 has a gain value of 110 to 800, this value determines the amplification capacity of the transistor. The maximum amount of current that could flow through the Collector pin is 100mA, hence we cannot connect loads that consume more than 100mA using this transistor. To bias a transistor we have to supply current to base pin, this current (I_B) should be limited to 5mA.



2.5 RESISTOR

A **resistor** is a passive two-terminal electrical component that implements electrical resistance as a circuit element. In electronic circuits, **resistors** are used to reduce current flow, adjust signal levels, to divide voltages, bias active elements, and terminate transmission lines, among other uses.



2.6 9V BATTERY

A **battery** is a device consisting of one or more electrochemical cells with external connections for powering electrical devices such as flashlights, mobile phones, and electric cars. When a **battery** is supplying electric power, its positive terminal is the cathode and its negative terminal is the anode.



2.7 WIRE

Electrical wiring is an *electrical* installation of cabling and associated devices such as switches, distribution boards, sockets, and light fittings in a structure.



2.8 BUZZER

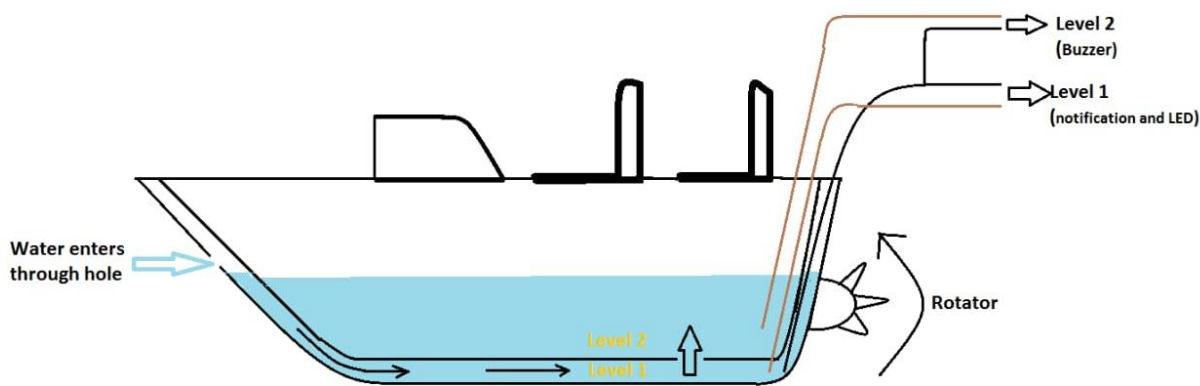
A **buzzer** or beeper is an audio signalling device, which may be mechanical, electromechanical, or piezoelectric (piezo for short). Typical uses of buzzers and beepers include alarm devices, timers, and confirmation of user input such as a mouse click or keystroke.



3. METHODOLOGY

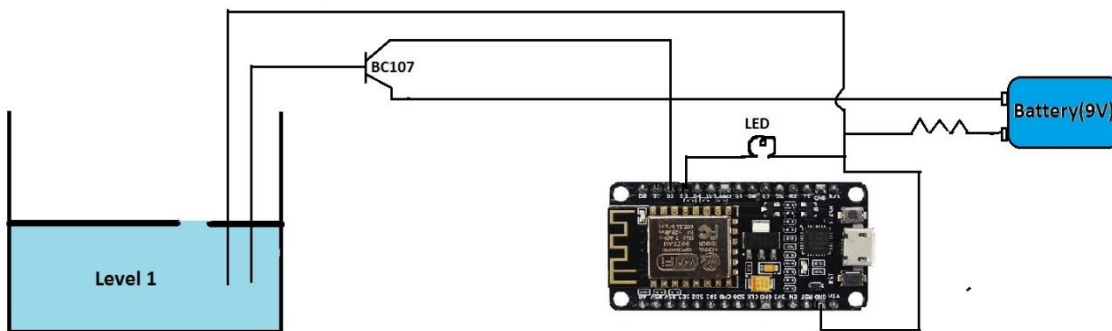
We are assuming a simple boat having two levels. circuit consists of esp8266(wifi module), resistor,led,wire,transistor(BC107) ,battery and buzzer. Circuit connections are explained below.

We are assuming boat of two levels on both the levels we are placing the circuits.



3.1 Level 1: In level 1 we are placing the circuit consists esp8266,led,resistor(330 ohm),transistor(BC107),battery(9V)

Circuit diagram:



- It is difficult to make boat for each level so we are using a jar of water for easy explanation.

In this we are using wifi module esp8266, esp32 can also be used. D1 and D2 are high stranded output pins. Led is connected to D2 pins and ground through the resistor. When the wire When the water touches the base terminal the current flows through the base terminal and the collector voltage becomes low and wire from the ground touches the water, we will get notification in our mobile phone.

3.1.1 Programming Section:

Some coding part is also involved. We can code esp8266 using Arduino IDE software.



```
ESP_Pusher1 | Arduino 1.8.12
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ESP_Pusher1

#define WIFI_NAME "POCO M2 Pro"
#define WIFI_PASSWORD "Bhanu 123"
#define DEVICE_ID 3
#define DEVICE_NAME "ESP Pusher1"
#define TOKEN "~940659_RmME17KGfb8n8dirAAuof9Z2"

#include <RemoteMe.h>
#include <RBD_Button.h>
#include <RemoteMeSocketConnector.h>

#include <ESP8266WiFi.h>

//Define button connected to D1
RBD::Button button(D1);

boolean currentLedState;

RemoteMe& remoteMe = RemoteMe::getInstance(TOKEN, DEVICE_ID);

//***** CODE FOR COMFORTABLE VARIABLE SET *****
```



```
ESP_Pusher1 | Arduino 1.8.12
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ESP_Pusher1

inline void setLed(boolean b) {remoteMe.getVariables()->setBoolean("led", b); }

//***** IMPLEMENT FUNCTIONS BELOW *****

// comes from server also when the request came from this device
void onLedChange(boolean b) {
    // so we know what is current state
    currentLedState=b;
    //and set Diode connected to D2
    digitalWrite(D2, b?HIGH:LOW);
}

void setup() {
    pinMode(D2, OUTPUT);

    WiFi.begin(WIFI_NAME, WIFI_PASSWORD);

    while (WiFi.status() != WL_CONNECTED) {
        delay(100);
    }
}
```



ESP_Pusher1

```
while (WiFi.status() != WL_CONNECTED) {  
  delay(100);  
}  
  
remoteMe.getVariables()->observeBoolean("led" ,onLedChange);  
remoteMe.setConnector(new RemoteMeSocketConnector());  
remoteMe.sendRegisterDeviceMessage (DEVICE_NAME);  
}  
  
void loop() {  
  if (!remoteMe.loop()){//no connection established  
    return ;  
  }  
  if (button.onPressed()) {  
    //change state to opposite when button is pressed  
    currentLedState=!currentLedState;  
  
    //send to server and then server set it also at this ESP  
    setLed(currentLedState);  
  }
```



ESP_Pusher1

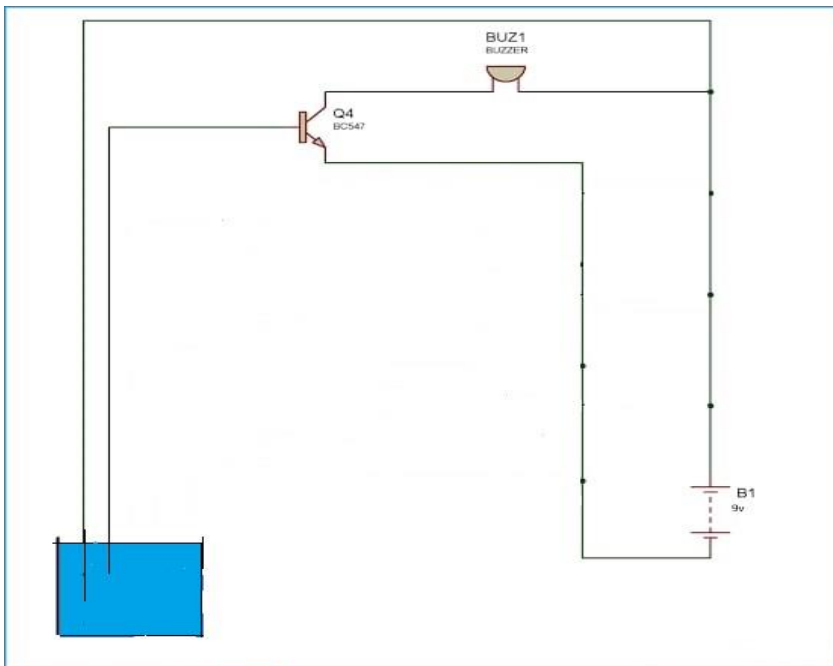
```
void loop() {  
  if (!remoteMe.loop()){//no connection established  
    return ;  
  }  
  if (button.onPressed()) {  
    //change state to opposite when button is pressed  
    currentLedState=!currentLedState;  
  
    //send to server and then server set it also at this ESP  
    setLed(currentLedState);  
  
    //and lets send push notification  
    String body="You've change button state to ";  
    body+=currentLedState?"ON":"OFF";  
    remoteMe.sendPushNotificationMessage(4,"Change by ESP",body,"badge.png","icon192.png","");  
  }  
}
```

Two inputs are served in D1 and D2 and that input will be feeded into the esp module using remote me and socket directories under a wifi controlled function.using void loop and if else statement to establish connection and get notification on the screen.

3.2 Level 2:

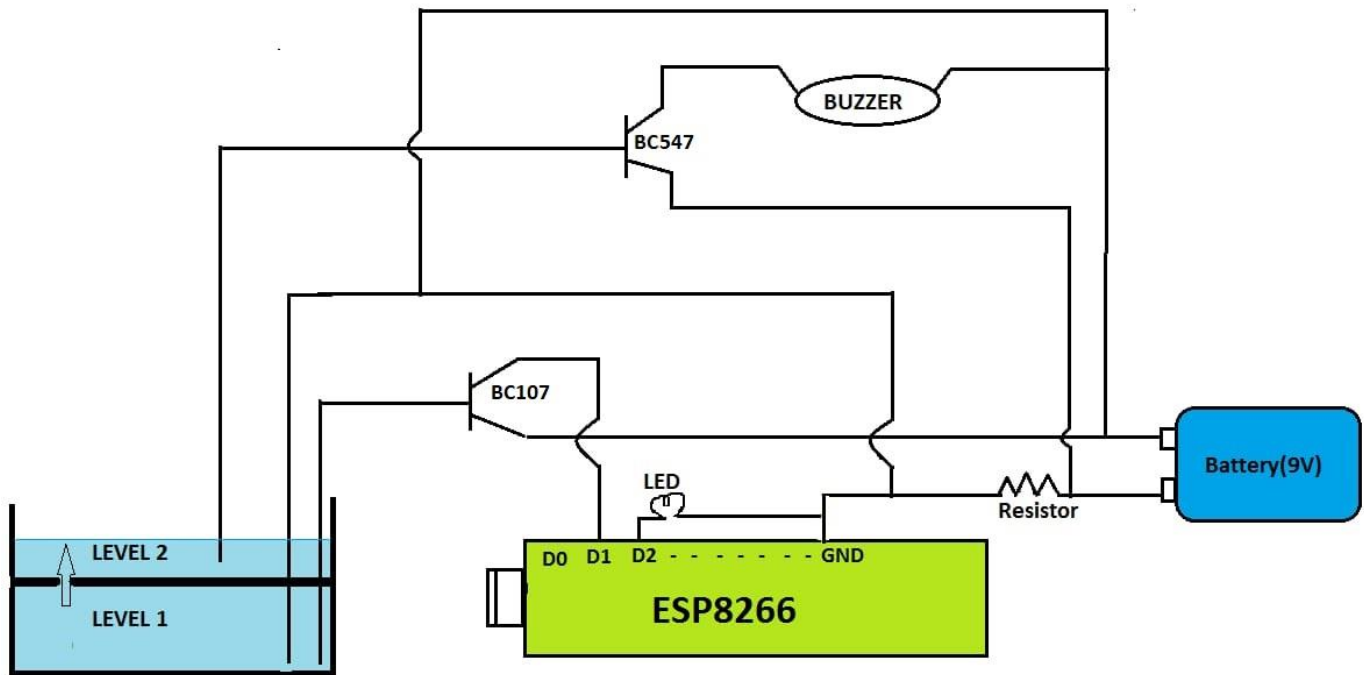
In level 2 we are using circuit consists of buzzer,transistor(BC547) and battery(9V).In this circuit emitter terminal of transistor is connected with battery and collector terminal is connected with the buzzer . Buzzer is connected with the battery and with the collector terminal. When the water touches the base terminal the current flows through the base terminal and the collector voltage becomes low.we will get the bipping sound of buzzer.

Circuit diagram:



3.3 Block diagram :

For combining both the circuits we are using common battery and common wire.



4. RESULTS

The project is done successfully, when water touches the wire in the first circuit we get the notification in the smart phone and in second circuit when water touches the wire we get the beeping sound from the buzzer.

5. CONCLUSION

In this project we made circuit using wifi module esp8266 and some basic components. This circuit can be used in many ways . We have shown one example using a simple boat . This can be implemented in a local passenger boat ,submarines etc. Sometimes if water enters into the boat passengers are unaware from that, this will ensure the safety of passenger.

6. REFERENCES

- www.remoteme.org
- <https://en.wikipedia.org/wiki/ESP8266>
- <https://www.arduino.cc>
- www.components101.com