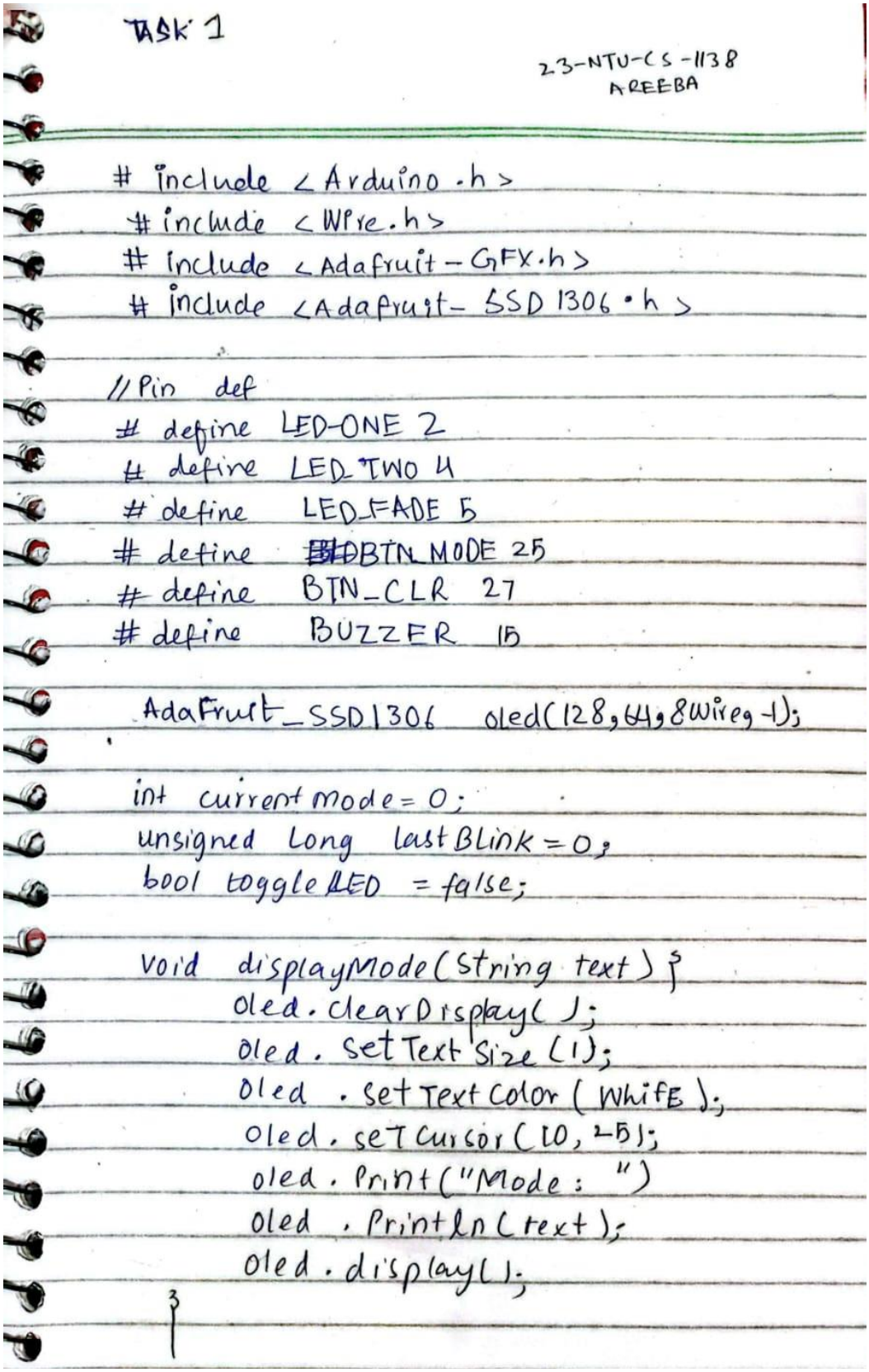
National Textile University, Faisalabad

Name:	Areeba Mohsin
Class:	CS (5th B)
Registration No:	23-NTU-CS-1138
Course Name:	IOT and Embedded devices
Submitted To:	Sir Nasir

Task 1

Code:



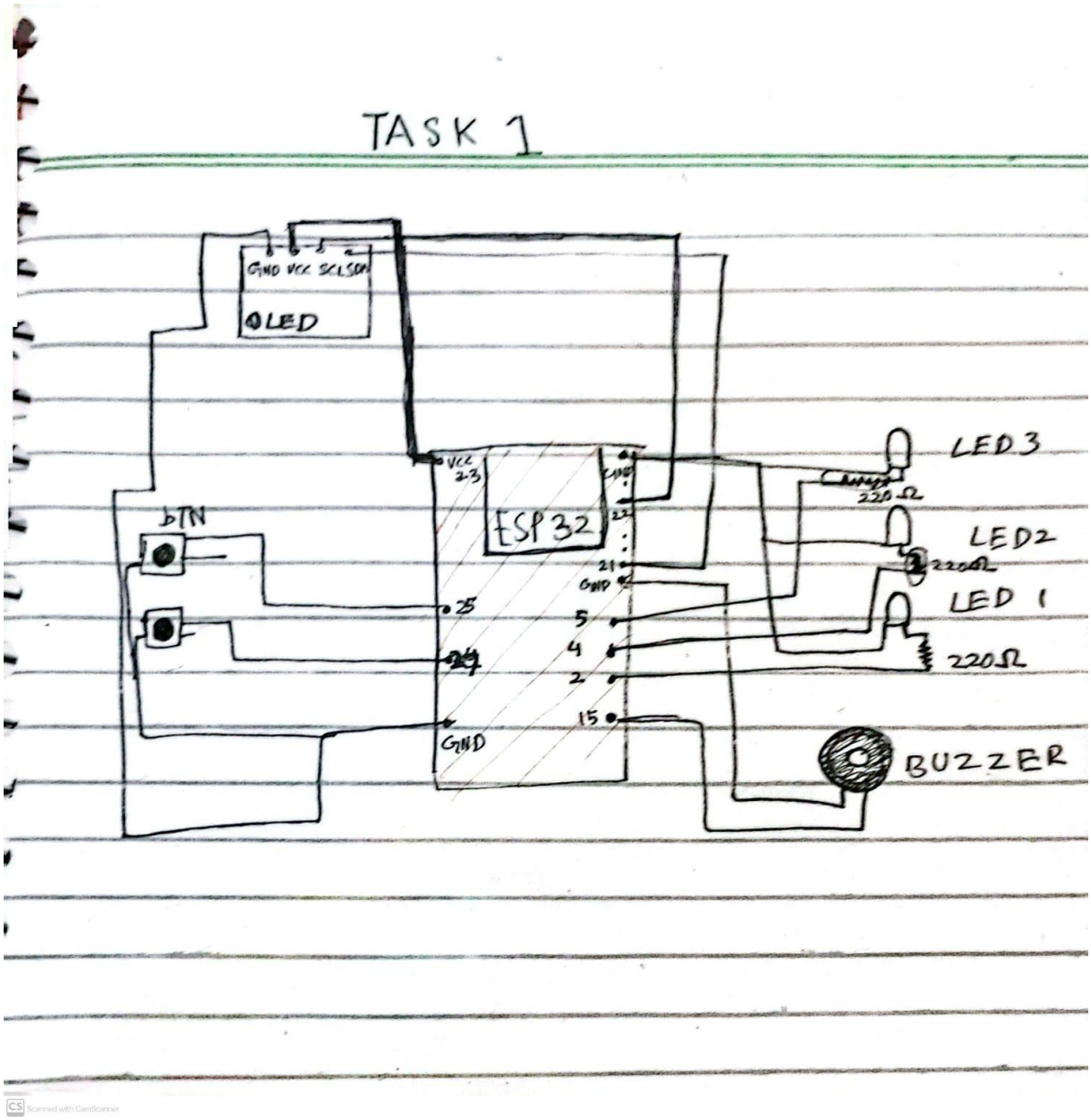
```
TASK 1
                                23-NTU-CS-1138
                                AREEBA

# include <Arduino.h>
# include <Wire.h>
# include <Adafruit-GFX.h>
# include <Adafruit-SSD1306.h>

// Pin def
# define LED-ONE 2
# define LED_TWO 4
# define LED_FADE 5
# define BTN_MODE 25
# define BTN_CLR 27
# define BUZZER 15

Adafruit_SSD1306 oled(128, 64, &Wire, -1);

int currentMode = 0;
unsigned long lastBlink = 0;
bool toggleLED = false;

void displayMode(String text) {
    oled.clearDisplay();
    oled.setTextSize(1);
    oled.setTextColor(WHITE);
    oled.setCursor(10, 25);
    oled.Print("Mode: ")
    oled.println(text);
    oled.display();
}
```

```
// Buzzer
void buzz(int freq, int dur){
    tone(BUZZER, freq, dur);
    delay(dur + 40);
    noTone(BUZZER);
}

void setup(){
    PinMode(LED_ONE, OUTPUT);
    PinMode(LED-TWO, OUTPUT);
    PinMode(LED_FADE, OUTPUT);
    PinMode(BTN_MODE, INPUT_PULLUP);
    PinMode(BTN_CLR, INPUT_PULLUP);
    PinMode(BUZZER, OUTPUT);

    oled.begin(SSD1306_SWITCHCAPVCC, 0x3C);
    oled.ClearDisplay();
    oled.display();

    displayMode("start | LEDs OFF");
}

void loop(){
    if (digitalRead(BTN_MODE)==LOW){
        delay(200);
        currentMode++;
        if(currentMode > 4) currentMode = 1;
        switch(currentMode){
            case 1:
                digitalWrite(LED-ONE, LOW);
```

```
        digitalWrite(LED_TWO, LOW);
        displayMode("All OFF");
        buzz(800, 100);
        break;
    case 2:
        displayMode("Alternate Blink");
        buzz(950, 100);
        break;

    case 3:
        digitalWrite(LED_ONE, HIGH);
        digitalWrite(LED_TWO, HIGH);
        displayMode("All ON");
        buzz(1150, 100);
        break;
    case 4:
        displayMode("PWM Fade Mode");
        buzz(1400, 100);
        break;
    }
}

if(digitalRead(BTN_CLR) == LOW){
    delay(200);
    currentMode = 1;
    digitalWrite(LED_ONE, LOW);
    digitalWrite(LED_TWO, LOW);
    analogWrite(LED_FADE, 0);
    displayMode("Reset → OFF");
    buzz(500, 200);
}
```

```
if (currentMode == 2) {
    if (millis() - lastBlink >= 500) {
        lastBlink = millis();
        toggleLED = !toggleLED;
        digitalWrite(LED_ONE, toggleLED);
        digitalWrite(LED_TWO, !toggleLED);
    }
}

if (currentMode == 4) {
    for (int i = 0; i <= 255; i++) {
        analogWrite(LED_FADE, i);
        delay(5);
    }

    for (int i = 225; i >= 0; i--) {
        analogWrite(LED_FADE, i);
        delay(5);
    }
}
```

DIAGRAM:



Wokwi link:

https://wokwi.com/projects/445801309117058049

TASK 2

CODE:

Task 2

```
// 23-NFU-CS-1138        Areeba Mohsin
#include <Arduino.h>
#include <Wire.h>
#include <Adafruit_GFX.h>
#include <Adafruit_SSD1306.h>

// Pin def
#define BTN 25
#define LED 2
#define BUZZER 15

Adafruit_SSD1306 display(128,64,&wire,-1);
//Var
bool ledState = false;
unsigned long pressTime = 0;
bool pressed = false;

void showText(String msg){
    display.clearDisplay();
    display.setTextSize(1);
    display.setTextColor(WHITE);
    display.setCursor(0, 20);
    display.println(msg);
    display.display();
}

void setup(){
    PinMode(BTN, INPUT_PULLUP);
    Pind Mode(LED, OUTPUT);
    PinMode(BUZZER, OUTPUT);
```

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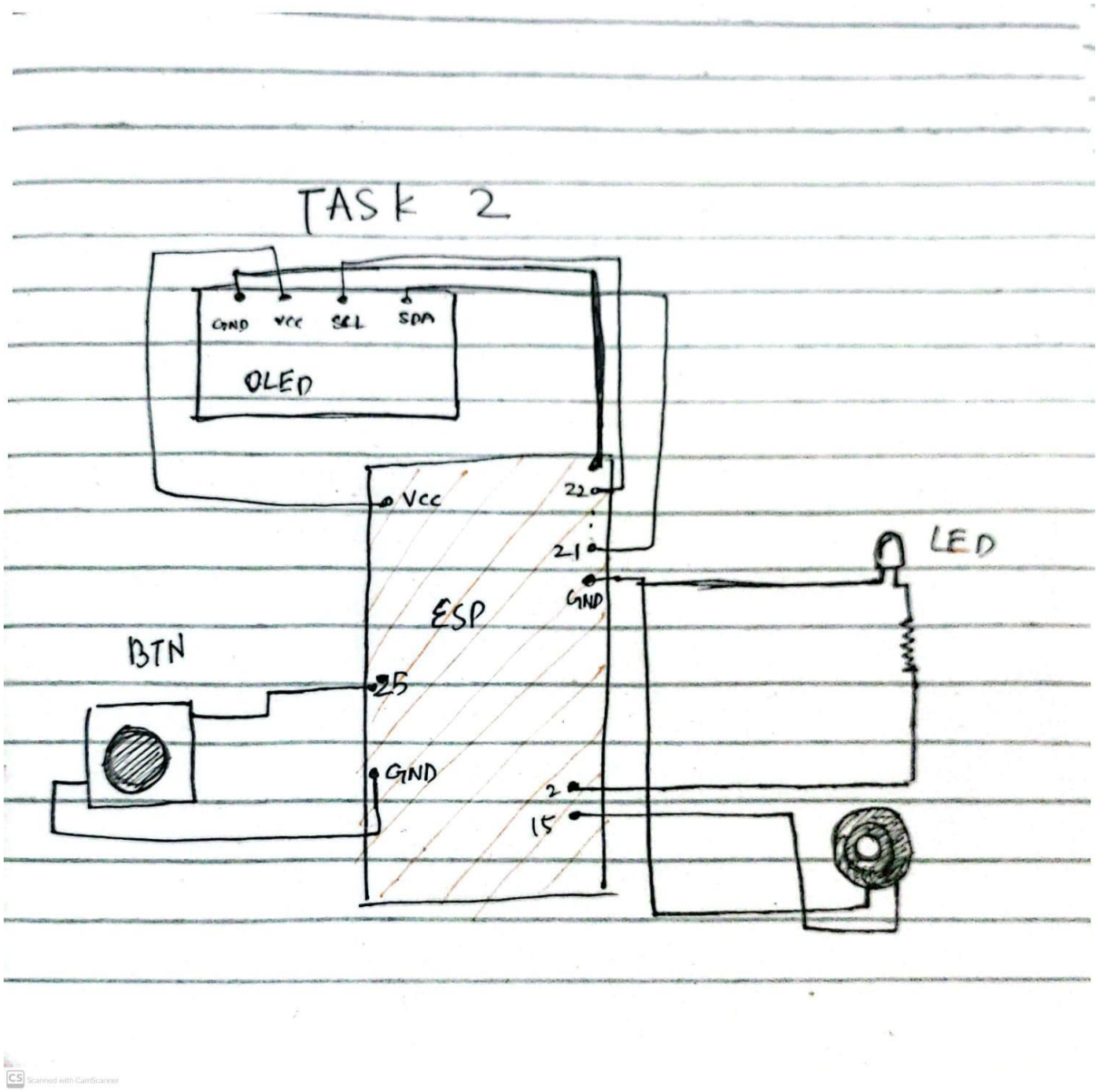
```
// OLED initialize.
display.begin(SSD1306_SWITCHCAPVCC, 0x3C);
showText("Ready...");
}

void loop() {
    if (digitalRead(BTN) == LOW && !pressed) {
        pressed = true;
        Presstime = millis();
    }
    if (digitalRead(BTN) == HIGH && pressed) {
        unsigned long duration = millis() - PressTime;
        pressed = false;

        if (duration > 1500) {
            tone(Buzzer, 1000, 500);
            ShowText("longPress: Buzzer");
        }
        else {
            ledState = ! ledState;
            digitalWrite(LED, Ledstate);
            ShowText("Short Press: LED Toggle");
            }
        }
}
```

DIAGRAM:



WOKWI LINK:

https://wokwi.com/projects/445803461404542977

GITHUB REPOSITORY LINK:

https://github.com/areebamohsin01-arch/IOT-and-Embedded-System