## **National Textile University, Faisalabad**



## **Department of Computer Science**

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Section	BSCS 5 <sup>th</sup> -B
Subject	Embedded & IoT Systems
Assignment	1-Task(A)
Submitted to	Sir Nasir

## Task B

**Task B** — **Coding:** Use a single button with press-type detection (display the event on the OLED): • Short press  $\rightarrow$  toggle LED • Long press (> 1.5 s)  $\rightarrow$  play a buzzer tone.

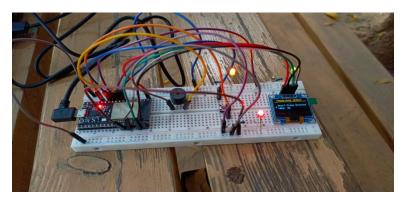
```
src > 😉 main.cpp > ...
     //Nimra Fatima 23-NTU-CS-1081
      //Buzzer with press detection
      #include <Arduino.h>
      #include <Wire.h>
  5
      #include <Adafruit_GFX.h>
      #include <Adafruit_SSD1306.h>
      // --- OLED setup ---
     #define SCREEN_WIDTH 128
      #define SCREEN_HEIGHT 64
      #define OLED ADDR 0x3C
 12
      Adafruit_SSD1306 display(SCREEN_WIDTH, SCREEN_HEIGHT, &Wire, -1);
      // --- Pin Configuration ---
     #define BUTTON_PIN 34
     #define LED1 17
      #define LED2 18
      #define LED3 19
      #define BUZZER 12
      // --- Variables for button press detection ---
      unsigned long pressStartTime = 0;
```

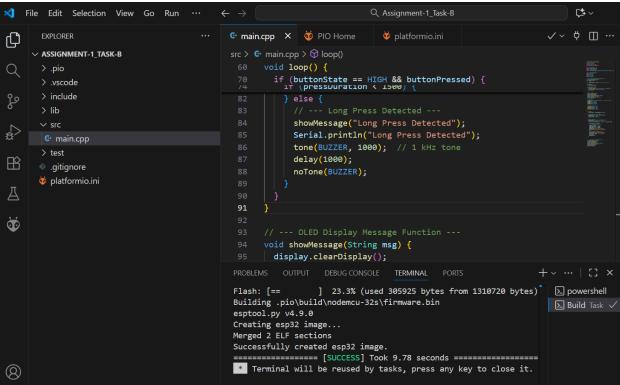
```
bool ledsOn = false;
     void showMessage(String msg); // Function declaration
28 \sim \text{void setup()}  {
       Serial.begin(115200);
       // OLED Initialization
       Wire.begin(21, 22);
       if (!display.begin(SSD1306_SWITCHCAPVCC, OLED_ADDR)) {
         Serial.println(F("OLED init failed"));
         while (true);
       // Clear OLED
       display.clearDisplay();
       display.setTextSize(1);
       display.setTextColor(SSD1306_WHITE);
       display.setCursor(10, 20);
       display.println("System Ready!");
       display.display();
```

```
void setup() {
 // Pin modes
  pinMode(BUTTON_PIN, INPUT_PULLUP); // Button active LOW
  pinMode(LED1, OUTPUT);
  pinMode(LED2, OUTPUT);
 pinMode(LED3, OUTPUT);
 pinMode(BUZZER, OUTPUT);
 // Initially all OFF
 digitalWrite(LED1, LOW);
 digitalWrite(LED2, LOW);
 digitalWrite(LED3, LOW);
  digitalWrite(BUZZER, LOW);
void loop() {
 int buttonState = digitalRead(BUTTON_PIN);
 // Button pressed (active LOW)
 if (buttonState == LOW && !buttonPressed) {
    buttonPressed = true;
   pressStartTime = millis();
```

```
// Button released
if (buttonState == HIGH && buttonPressed) {
  buttonPressed = false;
 unsigned long pressDuration = millis() - pressStartTime;
  if (pressDuration < 1500) {</pre>
    // --- Short Press Detected ---
    ledsOn = !ledsOn;
    digitalWrite(LED1, ledsOn);
    digitalWrite(LED2, ledsOn);
   digitalWrite(LED3, ledsOn);
    showMessage("Short Press Detected");
    Serial.println("Short Press Detected");
  } else {
   // --- Long Press Detected ---
    showMessage("Long Press Detected");
    Serial.println("Long Press Detected");
    tone(BUZZER, 1000); // 1 kHz tone
   delay(1000);
```

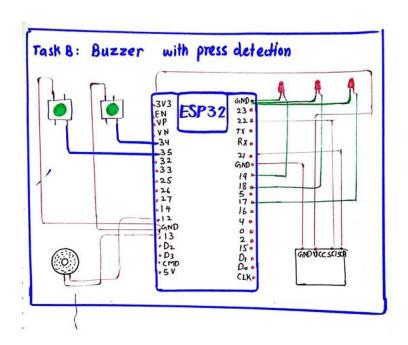
## **Output:**





Handwritten code:

K-B Assignment #1	11 Pin modes
Buzzer with Press detection Cycle"	PinMode (Green-LED, output);
	Pin Mode (Blue-LED, output);
	PinMode (PURPLE, LED, Output);
	rinmade roken contact);
#include cwire.hz	PinMode (BUZZER PIN, output);
# include < Adapruit - GFX.h7	"Initially all OFF
#include < Adaprait - SSD1306.h>	digital write (Green_LED, LOW);
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11 OLED Setup	1: Vitalurite Purile LED, 1000)
#Edefine SCREEN-WIDTH 128	digital Write (BUZZEr PIN, LOW);
# define SCREEN-HEIGHT 64	
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1. 1 1 0 0120/ licolay/Steen. Night 13C	if ( ! display begin (SSD1306 SWITCHCAPICC, OLED.
Adagrant _SSDS06 aspect Height, swire, -1);	Serial print In ("OLED init failed!")
u O: a mliquadion	While (tree);
11 Pin configuration	3
#defin BUTTON-pin 35	
#define Green-LED 19	display (kax Display ();
# define BIVE_LED 18	li-olas cot lext bive (= /)
# define PURPLE LED 17	display set cussos (0, 10);
# define BUZZER_PIN S	display display ();
Variables for button press detection	asping as from
Vandbles for builty pass out	- Vaid 1 . 10/15
unsigned long pressstart Time = 0;	Void toop()}
bool buttonfressed - false;	· 1 Ludday of 1 Light 1 P . 1 / D. 1974 M OI
bool ledson = jalse;	int buttonstate = digital Read (BUTTON-PI
12	
Void setupl) {	if (buttonstate == low &s! buttonpressed)
serial begiln (115200);	
0	
Pin Mode (Button-PIN, Input pullup);	* II
PinMode (Button-PIN, Input-pullup);	° 11
// Button configuration	
// Button configuration	
// Button configuration	Vaid Show Message (string msg) {
// Button configuration  puttonpressed = true;  pressert Time = millis();	Void ShowMessage (string msg) {
// Button configuration  puttonpressed = true;  pressert Time = millis();	Void ShowMessage (string msg) { // OLEP display messages.
// Button configuration  Duttonpressed = true;  prewstart Time = millis ();  if (prewDuration < 1500) {	Void ShowMessage (string msg) {  // OLED display messages.
// Button configuration  Duttonpressed = true;  prewstart Time = millis ();  if (prewDuration < 1500) {	display. Clear Display ()
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J/ Button configuration  Duttonpressed = true;  preMStart Time = millis ();  if (preMDuration < 1500) {  Ledson = [ledson;  digital write (Green LED, Ledon);  digital write (Blue LED, Ledon);	display Clear Display ();  display Set Text Size (1);  display set Text Color (SSD1306 - White)
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Justion configuration  puttonpressed = true;  previsibility = millis();  if (previousation < 1500) {  Ledson = [ledson;  digitalwrite (Green LED, Ledon);  digitalwrite (Blue LED, Ledon);  ShowMessage (ledon ? "short press: LEDson"  j short press: LEDs OFF");  else {  ShowMessage ("Long press: Buzzer!");  Serial Print In ["Buzzes Tone Playing.");  Jone (Buzzer-PIN, 1000);	display clear Display ();  display set Text Size (1);  display set Text color (ssol 306 - white)  display set cursor (0, 20);  display print In (msg);
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