

Template for Arduino and LED Interfacing Activity

Statement Given:

Task I:

Interfacing of LEDs and pattern generation

Use Arduino and LED Board to perform following activities

- Different Patterns of LED on- off sequence and duration of on - off time

Task II:

Interfacing and controlling of LEDs using Push switch Button provided on LED board.

- Control LED on/off patterns with push button input.

Evaluation Criteria:

1. Connections as per task given,
2. Code for Arduino for the Task.
3. Successful execution of the activities.

Performance-15 Marks

Submission-10 Marks

Team

| Sr No | Roll No | Name | Work Done |
|-------|---------|-----------------|------------------------|
| 1 | 53 | Shreyans Tatiya | Coding |
| 2 | 51 | Shreya Nair | Circuit Setup |
| 3 | 52 | Shreya Menon | Coding |
| 4 | 54 | Shreyash Thakur | Circuit Implementation |
| 5 | 55 | Shriya Shetty | Circuit Implementation |

Fill your details as per following points

- **Circuit Diagram for the tasks.**
- **Respective codes**
- **Photo of Actual implementation**
- **Observations , reflection on activity**

Codes:

```
// the setup function runs once when you press reset or power the board
void setup() {
  // initialize digital pin LED_BUILTIN as an output.
  pinMode(LED_BUILTIN, OUTPUT);
}

// the loop function runs over and over again forever
void loop() {
  digitalWrite(LED_BUILTIN, HIGH); // turn the LED on (HIGH is the voltage level)
  delay(100);                      // wait for a second
  digitalWrite(LED_BUILTIN, LOW);  // turn the LED off by making the voltage LOW
  delay(100);                      // wait for a second
}
```

```
const int ledPins[] = {9,10,11,12,13}; // Change these pins as per your connections
const int numOfLeds = 5;
int pushButton = 12;

void setup()
{
  Serial.begin(9600);
  pinMode(pushButton, INPUT);
  // pinMode(led, OUTPUT);
  for (int i = 0; i < numOfLeds; i++) {
    pinMode(ledPins[i], OUTPUT);
  }
}

void loop()
{
  int buttonState = digitalRead(pushButton);
  Serial.println(buttonState);
  if (buttonState == 0)
  {
    for (int i = 0; i < numOfLeds; i++) {
      digitalWrite(ledPins[i], HIGH);
      delay(100); // Wait for 100ms
      digitalWrite(ledPins[i], LOW);
    }
  }
}
```

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Course: Introduction to Project Based Learning

```
}  
}  
else  
{  
    // Pattern 2: Turn on all LEDs  
    for (int i = 0; i < numOfLeds; i++) {  
        digitalWrite(ledPins[i], LOW);  
    }  
    delay(500); // Wait for 500ms  
}  
delay(100);  
}
```

```
const int ledPins[] = {2, 3, 4, 5, 6}; // Change these pins as per your connections  
  
const int numOfLeds = 5;  
  
int pushButton = 12;  
  
void setup()  
{  
    Serial.begin(9600);  
  
    pinMode(pushButton, INPUT);  
  
    // pinMode(led, OUTPUT);  
  
    for (int i = 0; i < numOfLeds; i++) {  
        pinMode(ledPins[i], OUTPUT);  
    }  
}  
  
void loop()  
{  
  
    int buttonState = digitalRead(pushButton);  
  
    Serial.println(buttonState);  
  
    if (buttonState == 1)
```

```
{  
  
  for (int i = 0; i < numOfLeds; i++) {  
  
    digitalWrite(ledPins[i], HIGH);  
  
    delay(100); // Wait for 100ms  
  
    digitalWrite(ledPins[i], LOW);  
  
  }  
  
}  
  
else  
  
{  
  
  // Pattern 2: Turn on all LEDs  
  
  for (int i = 0; i < numOfLeds; i++) {  
  
    digitalWrite(ledPins[i], LOW);  
  
  }  
  
  delay(500); // Wait for 500ms  
  
}  
  
delay(100);  
  
}
```

- **Circuit Diagram for the tasks & Photo of Actual implementation:**

<https://drive.google.com/file/d/1MHRj6fa2KS4ADQnUnC1IrNMlm4tZT4DT/view>

(please copy paste this link in your browser if it is not opening directly)

- **Observations:**

Successfully executed the Arduino Uno activity.

Implemented the blinking of lights using provided codes.

Noticed the correlation between the code and the LED behavior.

Reflection on Activity:

Engaging in the Arduino Uno activity was both insightful and practical. It provided a hands-on experience in coding and interacting with hardware. The connection between the written code and the physical output of the LED lights was fascinating. This activity not only enhanced coding skills but also deepened the understanding of how programming influences tangible outcomes in the realm of electronics. Looking forward to more such experiential learning opportunities.