Al-Mustaqbal University
Department of Medical Instrumentation Techniques Engineering
Class: four
Subject: Advanced logic design
Lecturer: Dr. Zahraa hashim kareem
Eng.Ali Ibrahim
Eng.Hussein Mazin
Lecture- 2:
"Arduino Uno LED Blinking Experiment"

Objective: To learn the basics of programming and controlling an LED using an Arduino Uno.

Materials:

- Arduino Uno board

- USB cable

- LED (any color)

- 220-330-ohm resistor

- Breadboard

- Jumper wires

Experimental Setup:

1. Circuit Setup:

   a. Insert the LED into the breadboard.

   b. Connect one leg of the LED (the longer one) to one end of the resistor.

   c. Connect the other end of the resistor to one of the Arduino's digital pins (e.g., pin 13).

   d. Connect the shorter leg of the LED directly to the Arduino's ground (GND) pin.

   e. Connect one end of the USB cable to the Arduino Uno and the other to your computer.

2. Arduino IDE:

   a. Install the Arduino IDE on your computer if you haven't already.

   b. Open the Arduino IDE.

3. Programming:

   a. Write a simple Arduino sketch to make the LED blink. Here's an example code:

```cpp
cpp
const int ledpin1=13;
const int ledpin2=12;
```

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```
const int ledpin3=11;

  void setup() {

   pinMode(ledpin13, OUTPUT); // Set digital pin 13 as an output

   pinMode(ledpin12,OUTPUT) ; // Set digital pin 12 as an output

   pinMode(ledpin11,OUTPUT) ; // Set digital pin 11 as an output

  }


  void loop() {

   digitalWrite(ledpin13, HIGH); // Turn the LED on

   delay(1000);        // Wait for 1 second

   digitalWrite(ledpin13, LOW);  // Turn the LED off

   delay(500);        // Wait for 0.5 second

   digitalWrite(ledpin12, HIGH); // Turn the LED on

   delay(1000);        // Wait for 1 second

   digitalWrite(ledpin12, LOW);  // Turn the LED off

   delay(500);        // Wait for 0.5 second

   digitalWrite(ledpin11, HIGH); // Turn the LED on

   delay(1000);        // Wait for 1 second

   digitalWrite(ledpin11, LOW);  // Turn the LED off

   delay(500);        // Wait for 0.5 second



  }
```

4. Upload the Code:

   a. Click the "Upload" button in the Arduino IDE to upload the code to your Arduino Uno.

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5. Observation:

   a. You should observe the LED connected to pin 13 blinking on and off every second.

6. Experiment Variations:

   - Try changing the delay times in the code to see how it affects the LED blinking rate.

   - Experiment with different digital pins on the Arduino to control the LED.

This experiment is a basic introduction to working with Arduino Uno and programming in the Arduino IDE. You can build upon this knowledge to create more complex projects and experiments with Arduino.

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