**Outline**

Write a program to blink the on-board LED based on user commands from the serial monitor. Parse commands to turn on and off the LED as well as blink it a specified number of times.

**Objectives**

**Prerequisites**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Prerequisite Module(s)** | **Level** | **Student Initial** | **Teacher Initial** | **Date** |
| None |  |  |  |  |

**Materials**

* Arduino Development Environment (IDE)
* Arduino proto board

Answers!

**Level 0: Sample Program**

1. Implement and run the sample program defined in Appendix A..

DONE

1. Observe the number times the LED blinked. DONE

DONE

1. Explain why the LED only blinked 4 times.

The LED blinked 4 times because, the (int times=) was set to 5 not 4.

**Level 1: Variable Scope**

**3.** Int Times= Value states that the number of times to blink the LED equals to the blink value(causes the Int Times to change into the value given).

**4. a.** The first definition of integer applies before the void setup and the second definition applies in the void loop

**b.** There is no overlap because there is no integer being applied at the same time in each void.

**Level 2: Adding Colored LEDs**

1. Extend your proto-board to add two colored LEDs.

DONE

1. Modify your procedure definition on line #23 to look like the following:  
   “int blink(int value, int led) {“  
   DONE
2. Modify the code in your procedure to light up the LED indicated in the procedure parameter.  
   DONE
3. Modify your main loop to correctly use your new procedure definition.

**CODE LEVEL 2**

int YellowLED =12;

int RedLED =11;

void setup() {

  pinMode(YellowLED, OUTPUT);

  pinMode(RedLED, OUTPUT);

  Serial.begin(9600);

}

void loop() {

  int timesBlinked = blink(4,YellowLED);

  timesBlinked = blink(5,RedLED);

  Serial.print("The LED was SUPPOSED to blink ");

  Serial.print(timesBlinked);

  Serial.print(" times BUT only blinked ");

  Serial.println(timesBlinked);

  delay(1000);

}

int blink(int value,int led) {

  for (int i = 0; i < value; i++) {

    digitalWrite(led, HIGH);   // turn the LED on (HIGH is the voltage level)

    delay(500);                       // wait for a second

    digitalWrite(led, LOW);    // turn the LED off by making the voltage LOW

    delay(500);                       // wait for a second

  }

  Serial.print("The LED blinked ");

  Serial.print(value);

  Serial.println(" times.");

  return value;

}

**Code Level 3**

int YellowLED = 12;

int RedLED = 11;

long randOn = 0;

long randOff = 0;

void setup()

{

 randomSeed (analogRead (0));

 pinMode(YellowLED, OUTPUT);

 pinMode(RedLED, OUTPUT);

 Serial.begin(9600);

}

void loop(){

 int value = random(1, 10);

 int led = random(11, 13);

 int timesBlinked = blink(value,led);

  Serial.print(&quot;The LED was SUPPOSED to blink &quot;);

  Serial.print(timesBlinked);

  Serial.print(&quot; times BUT only blinked &quot;);

  Serial.println(timesBlinked);

  delay(1000);

}

int blink(int value,int led) {

  for (int i = 0; i &lt; value; i++) {

    randOff = random (200, 900);

    digitalWrite(led, HIGH);   // turn the LED on (HIGH is the voltage level)

    delay(1000);                       // wait for a second

    digitalWrite(led, LOW);    // turn the LED off by making the voltage LOW

    delay(randOff);                       // wait for a second

  }

  Serial.print(&quot;The LED blinked &quot;);

  Serial.print(value);

  Serial.println(&quot; times.&quot;);

  Serial.print(led);

  return value;

}