

**Date : 07/03/2022**

# **CSLR61 : EMBEDDED SYSTEMS LAB-5**

**Roll no. : 106119100**

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**Section : CSE-B**

# 1. Blink Led In Arduino UNO Simulator using Tinkercad

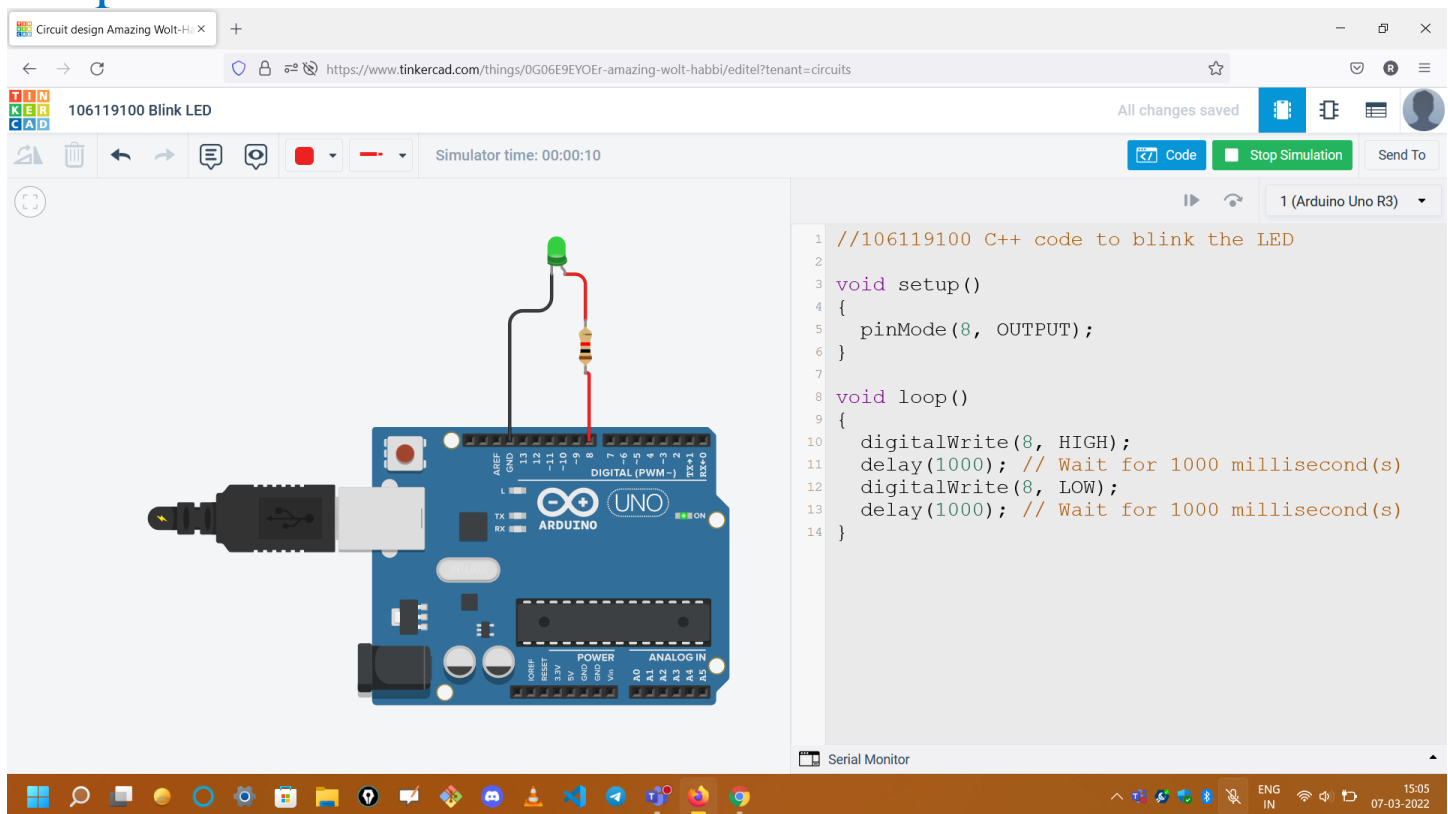
## Code

```
// 106119100 C++ code to blink the LED

void setup(){
    pinMode(8, OUTPUT);
}

void loop(){
    digitalWrite(8, HIGH);
    delay(1000); // Wait for 1000 millisecond(s)
    digitalWrite(8, LOW);
    delay(1000); // Wait for 1000 millisecond(s)
}
```

## Output



2. Blink LEDs in alternate order – 1 and 3 together and 2 and 4 together.

Code:

```
// 106119100 C++ code to Blink Alternative LED
void setup(){
    pinMode(5, OUTPUT);
    pinMode(6, OUTPUT);
    pinMode(7, OUTPUT);
    pinMode(8, OUTPUT);
}
void loop(){
    digitalWrite(5, LOW);
    digitalWrite(7, LOW);
    digitalWrite(8, HIGH);
    digitalWrite(6, HIGH);
    delay(2000);
    digitalWrite(8, LOW);
    digitalWrite(6, LOW);
    digitalWrite(5, HIGH);
    digitalWrite(7, HIGH);
    delay(2000);
}
```

# Output:

Circuit design Copy of 106119100

https://www.tinkercad.com/things/dMFJWHFTl6m-copy-of-106119100-wait-for-1-and-2-sec-for-odd-and-even-count-/edit?tenant=circuits

106119100 Blink Alternative LED

All changes saved

Simulator time: 00:00:07

Code Stop Simulation Send To

1 (Arduino Uno R3)

```
1 // 106119100 C++ code to Blink Alternative LED
2
3 void setup() {
4   pinMode(5, OUTPUT);
5   pinMode(6, OUTPUT);
6   pinMode(7, OUTPUT);
7   pinMode(8, OUTPUT);
8 }
9
10 void loop() {
11
12   digitalWrite(5, LOW);
13   digitalWrite(7, LOW);
14   digitalWrite(8, HIGH);
15   digitalWrite(6, HIGH);
16   delay(2000);
17   digitalWrite(8, LOW);
18   digitalWrite(6, LOW);
19   digitalWrite(5, HIGH);
20   digitalWrite(7, HIGH);
21   digitalWrite(7, HIGH);
22   delay(2000);
23 }
```

Serial Monitor

16:01 07-03-2022

3. Blink LEDs – count from 1 to 15; if the board is counting odd value, wait for 1 sec, else wait for 2 sec.

Code:

```
// 106119100 C++ code to Wait for 1 and 2 sec for
// odd and even count
void setup()
{
    pinMode(5, OUTPUT);
    pinMode(6, OUTPUT);
    pinMode(7, OUTPUT);
    pinMode(8, OUTPUT);
}
void displayNumber(int n)
{
    digitalWrite(5, (n & 1) ? HIGH : LOW);
    n >>= 1;
    digitalWrite(6, (n & 1) ? HIGH : LOW);
    n >>= 1;
    digitalWrite(7, (n & 1) ? HIGH : LOW);
    n >>= 1;
    digitalWrite(8, (n & 1) ? HIGH : LOW);
}
void loop()
{
    for (int i = 1; i <= 15; i++)
    {
        displayNumber(i);
        if (i & 1)
            delay(1000);
        else
            delay(2000);
    }
}
```

## Output:

Circuit design Copy of 106119100

106119100 Wait for 1 and 2 sec for odd and even count

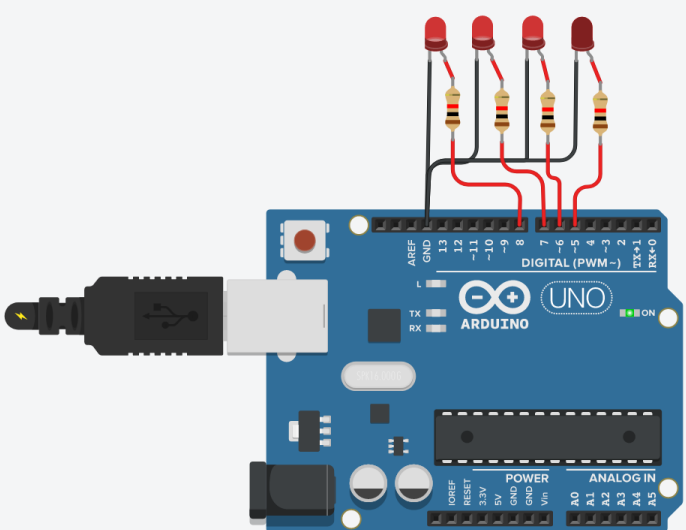
Simulator time: 00:00:18

Code Stop Simulation Send To

1 (Arduino Uno R3)

```
1 // 106119100 C++ code to Wait for 1 and 2 sec for
2 // odd and even count
3 void setup() {
4   pinMode(5, OUTPUT);
5   pinMode(6, OUTPUT);
6   pinMode(7, OUTPUT);
7   pinMode(8, OUTPUT);
8 }
9 void displayNumber(int n) {
10  digitalWrite(5, (n&1) ? HIGH : LOW);
11  n >>= 1;
12  digitalWrite(6, (n&1) ? HIGH : LOW);
13  n >>= 1;
14  digitalWrite(7, (n&1) ? HIGH : LOW);
15  n >>= 1;
16  digitalWrite(8, (n&1) ? HIGH : LOW);
17 }
18 void loop() {
19   for (int i = 1; i <= 15; i++) {
20     displayNumber(i);
21     if (i&1)
22       delay(1000);
23     else delay(2000);
24   }
25 }
```

Serial Monitor



#### 4. Blink LEDs – for all composite number below 15.

##### Code:

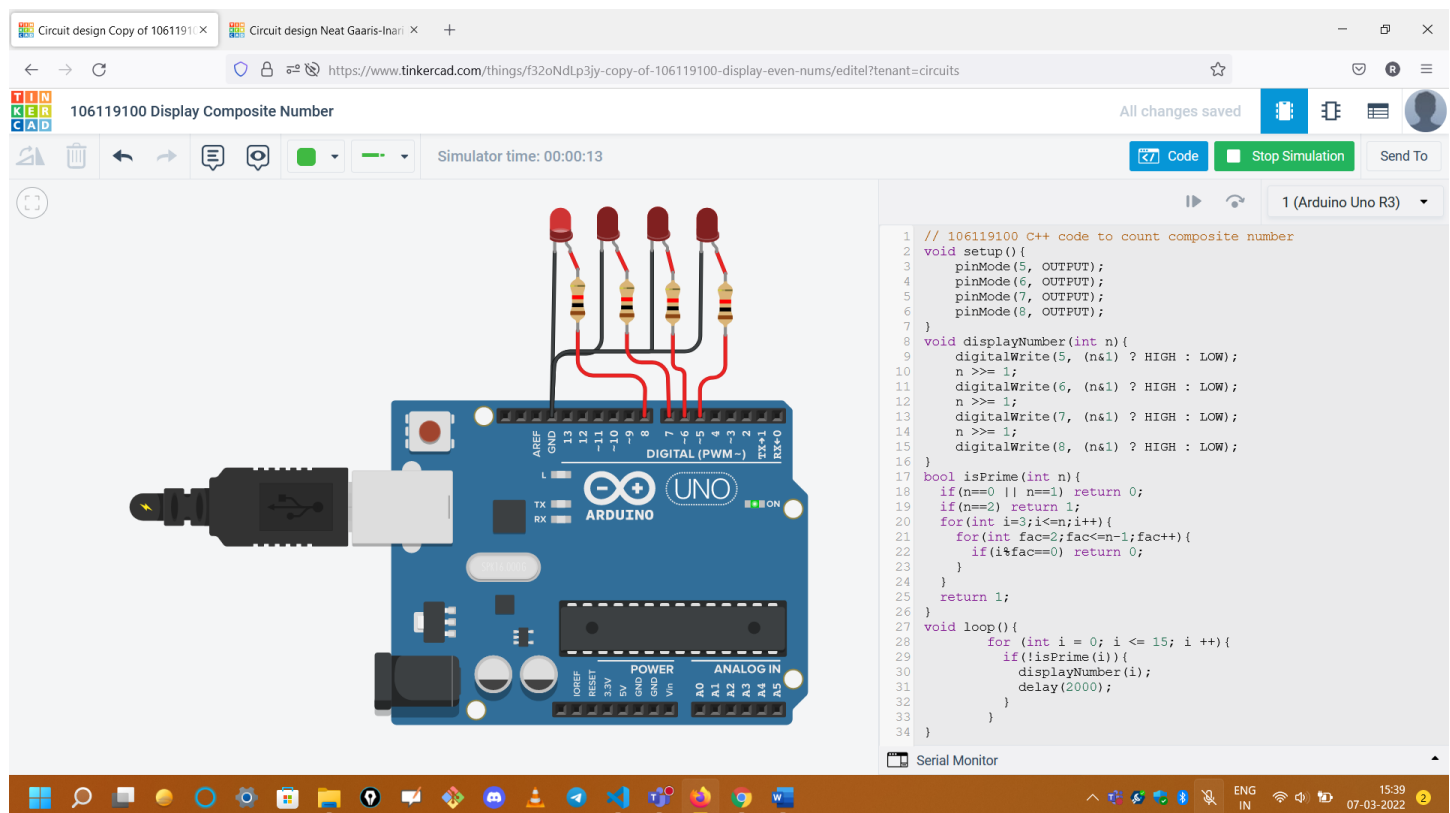
```
// 106119100 C++ code to count composite number
void setup()
{
    pinMode(5, OUTPUT);
    pinMode(6, OUTPUT);
    pinMode(7, OUTPUT);
    pinMode(8, OUTPUT);
}
void displayNumber(int n)
{
    digitalWrite(5, (n & 1) ? HIGH : LOW);
    n >>= 1;
    digitalWrite(6, (n & 1) ? HIGH : LOW);
    n >>= 1;
    digitalWrite(7, (n & 1) ? HIGH : LOW);
    n >>= 1;
    digitalWrite(8, (n & 1) ? HIGH : LOW);
}
bool isPrime(int n)
{
    if (n == 0 || n == 1)
        return 0;
    if (n == 2)
        return 1;
    for (int i = 3; i <= n; i++)
    {
        for (int fac = 2; fac <= n - 1; fac++)
        {
            if (i % fac == 0)
                return 0;
        }
    }
}
```

```

    }
    return 1;
}
void loop()
{
    for (int i = 0; i <= 15; i++)
    {
        if (!isPrime(i))
        {
            displayNumber(i);
            delay(2000);
        }
    }
}

```

Output:



The screenshot displays the Tinkercad web interface. On the left, a 3D model of an Arduino Uno R3 is shown with four red LEDs connected to digital pins 5, 6, 7, and 8. Each LED's anode is connected to a pin, and its cathode is connected to ground. A USB Type-A to B cable is plugged into the USB port. On the right, the C++ code for the project is displayed in a text editor. The code includes a setup function to configure pins 5, 6, 7, and 8 as outputs, and a loop function that iterates from 0 to 15, checking for prime numbers and displaying them on the LEDs with a 2-second delay. The status bar at the bottom indicates the simulator time is 00:00:13 and the selected board is 1 (Arduino Uno R3).

```

1 // 106119100 C++ code to count composite number
2 void setup() {
3   pinMode(5, OUTPUT);
4   pinMode(6, OUTPUT);
5   pinMode(7, OUTPUT);
6   pinMode(8, OUTPUT);
7 }
8 void displayNumber(int n) {
9   digitalWrite(5, (n&1) ? HIGH : LOW);
10  n >>= 1;
11  digitalWrite(6, (n&1) ? HIGH : LOW);
12  n >>= 1;
13  digitalWrite(7, (n&1) ? HIGH : LOW);
14  n >>= 1;
15  digitalWrite(8, (n&1) ? HIGH : LOW);
16 }
17 bool isPrime(int n) {
18   if (n==0 || n==1) return 0;
19   if (n==2) return 1;
20   for (int i=3; i<=n; i++) {
21     for (int fac=2; fac<=n-1; fac++) {
22       if (i%fac==0) return 0;
23     }
24   }
25   return 1;
26 }
27 void loop() {
28   for (int i = 0; i <= 15; i++) {
29     if (!isPrime(i)) {
30       displayNumber(i);
31       delay(2000);
32     }
33   }
34 }

```



## 5. Blink LEDs – to count even numbers

### Code:

```
// 106119100 C++ code to blink the LED

void setup()
{
    pinMode(5, OUTPUT);
    pinMode(6, OUTPUT);
    pinMode(7, OUTPUT);
    pinMode(8, OUTPUT);
}

void displayNumber(int n)
{
    digitalWrite(5, (n & 1) ? HIGH : LOW);
    n >>= 1;
    digitalWrite(6, (n & 1) ? HIGH : LOW);
    n >>= 1;
    digitalWrite(7, (n & 1) ? HIGH : LOW);
    n >>= 1;
    digitalWrite(8, (n & 1) ? HIGH : LOW);
}

void loop()
{
    for (int i = 0; i <= 15; i += 2)
    {
        displayNumber(i);
        delay(2000);
    }
}
```

# Output:

Circuit design Neat Gaaris-Inari x

https://www.tinkercad.com/things/fyc0JYCuyv0-neat-gaaris-inari/editel?tenant=circuits

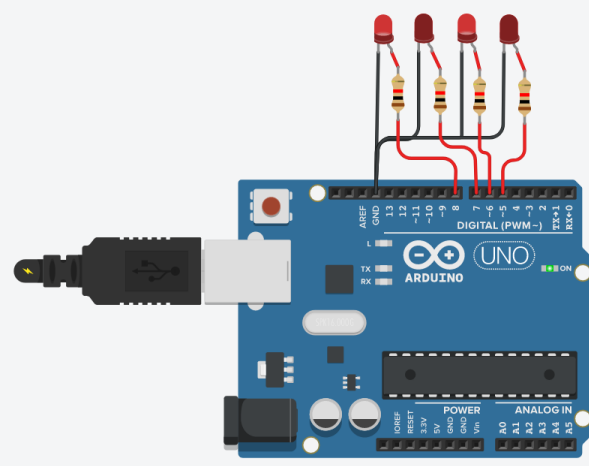
106119100 Display Even Nums

All changes saved

Simulator time: 00:00:11

Code Stop Simulation Send To

1 (Arduino Uno R3)



```
1 // 106119100 C++ code to blink the LED
2
3 void setup() {
4   pinMode(5, OUTPUT);
5   pinMode(6, OUTPUT);
6   pinMode(7, OUTPUT);
7   pinMode(8, OUTPUT);
8 }
9
10 void displayNumber(int n)
11 {
12   digitalWrite(5, (n&1) ? HIGH : LOW);
13   n >>= 1;
14   digitalWrite(6, (n&1) ? HIGH : LOW);
15   n >>= 1;
16   digitalWrite(7, (n&1) ? HIGH : LOW);
17   n >>= 1;
18   digitalWrite(8, (n&1) ? HIGH : LOW);
19 }
20
21 void loop() {
22   for (int i = 0; i <= 15; i += 2) {
23     displayNumber(i);
24     delay(2000);
25   }
26 }
```

Serial Monitor

15:28 07-03-2022