

INTERNET OF THINGS – IT134IU

LAB 1

Instructions: Please follow the steps:

1 – Students work in groups. Please answer the questions clearly. Remember to include your name and your student ID.

2 - Each group leader (ONLY the group leader, please!) submits the report in Pdf format and videos before the deadline.

Group Name:			
No	ID	Name	No Contribution (0 point)
1	ITITI21045	Nguyễn Minh Đức	16.66%
2	ITITI21123	Trần Hoàng Thế Bảo	16.66%
3	ITITI21217	Đỗ Đức Huy	16.66%
4	ITITI21076	Bùi Đức Mạnh	16.66%
5	ITITI21347	Phạm Quang Vinh	16.66%
6	ITITI20021	Hàng Huỳnh Công Thuận	16.7%

Video of all challenges:

<https://drive.google.com/drive/u/0/folders/1nTOutLXG5RzvfXVfUpwRBBSt9xwYDVBD>

LAB 1

1. Activity 1

Paste the source code here!

```
/*
  Blink

  Turns an LED on for one second, then off for one second, repeatedly.

  Most Arduinos have an on-board LED you can control. On the UNO, MEGA and
  ZERO
  it is attached to digital pin 13, on MKR1000 on pin 6. LED_BUILTIN is set
  to
  the correct LED pin independent of which board is used.
  If you want to know what pin the on-board LED is connected to on your
  Arduino
  model, check the Technical Specs of your board at:
  https://www.arduino.cc/en/Main/Products
  modified 8 May 2014
  by Scott Fitzgerald
  modified 2 Sep 2016
  by Arturo Guadalupi
  modified 8 Sep 2016
  by Colby Newman
  This example code is in the public domain.
  https://www.arduino.cc/en/Tutorial/BuiltInExamples/Blink
*/

// 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
}
```

-Make the led blink faster we reduce the delay time

```

/*
  Blink

  Turns an LED on for one second, then off for one second, repeatedly.

  Most Arduinos have an on-board LED you can control. On the UNO, MEGA and
  ZERO
  it is attached to digital pin 13, on MKR1000 on pin 6. LED_BUILTIN is set
  to
  the correct LED pin independent of which board is used.
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  This example code is in the public domain.
  https://www.arduino.cc/en/Tutorial/BuiltInExamples/Blink
*/

// 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(2000);                      // wait for a second
  digitalWrite(LED_BUILTIN, LOW);  // turn the LED off by making the
  voltage LOW
  delay(2000);                      // wait for a second
}

```

-Make the led blink slower we increase the delay time

2. Activity 2

Paste the source code here!

1. Flash the middle red and blue LED and the LED directly to the **right** of each color. Then flash the middle red and blue LED as well as the LED directly to the **left** of each color.

```
/*
Police Chaser Lights
Author: Jista Awesome
Date: December 2, 2016

This program flashes the middle red and blue LED and the LED directly to the
left of
each color. Then flashes the middle red and blue LED as well as the LED
directly to the
Right of each color.
*/

// the setup function runs once when you press reset or power the board
void setup() {
  // RED LED's < >BLUE LED's
  // initialize digital pin 13, 12, 11, 10, 9, 8 as an output.
  pinMode(13, OUTPUT); //Left Red
  pinMode(12, OUTPUT); //Middle Red
  pinMode(11, OUTPUT); //Right Red
  pinMode(10, OUTPUT); //Left Blue
  pinMode(9, OUTPUT); //Middle Blue
  pinMode(8, OUTPUT); //Right Blue
}

// the loop function runs over and over again forever
void loop() {
  digitalWrite(13, HIGH);
  digitalWrite(12, HIGH);
  digitalWrite(11, HIGH);
  digitalWrite(10, HIGH);
  delay(500);
  digitalWrite(13, LOW);
  digitalWrite(12, LOW);
  digitalWrite(11, LOW);
  digitalWrite(10, LOW);
  delay(500);
  //LED Alternate sides/////
  digitalWrite(11, HIGH);
  digitalWrite(10, HIGH);
  digitalWrite(9, HIGH);
  digitalWrite(8, HIGH);
  delay(500);
```

```
digitalWrite(11, LOW);  
digitalWrite(10, LOW);  
digitalWrite(9, LOW);  
digitalWrite(8, LOW);  
delay(500);  
}
```

2. Other flashing order

```
// the loop function runs over and over again forever  
void loop() {  
  digitalWrite(13, HIGH);  
  digitalWrite(12, HIGH);  
  digitalWrite(11, HIGH);  
  //digitalWrite(10, HIGH);  
  delay(100);  
  digitalWrite(13, LOW);  
  digitalWrite(12, LOW);  
  digitalWrite(11, LOW);  
  //digitalWrite(10, LOW);  
  delay(100);  
  /////LED Alternate sides/////  
  digitalWrite(10, HIGH);  
  digitalWrite(9, HIGH);  
  digitalWrite(8, HIGH);  
  //digitalWrite(8, HIGH);  
  delay(100);  
  digitalWrite(10, LOW);  
  digitalWrite(9, LOW);  
  digitalWrite(8, LOW);  
  //digitalWrite(8, LOW);  
  delay(100);  
}
```

3. Activity 3

Paste the source code here!

1. Change the flashing order to Red - Yellow - Green

```
// variables  
int GREEN = 8;
```

```

int YELLOW = 9;
int RED = 10;
int DELAY_GREEN = 2000;
int DELAY_YELLOW = 1000;
int DELAY_RED = 2000;

// basic functions
void setup()
{
    pinMode(GREEN, OUTPUT);
    pinMode(YELLOW, OUTPUT);
    pinMode(RED, OUTPUT);
}

void loop()
{
    red_light();
    delay(DELAY_RED);
    yellow_light();
    delay(DELAY_YELLOW);
    green_light();
    delay(DELAY_GREEN);
}

void green_light()
{
    digitalWrite(GREEN, HIGH);
    digitalWrite(YELLOW, LOW);
    digitalWrite(RED, LOW);
}

void yellow_light()
{
    digitalWrite(GREEN, LOW);
    digitalWrite(YELLOW, HIGH);
    digitalWrite(RED, LOW);
}

void red_light()
{
    digitalWrite(GREEN, LOW);
    digitalWrite(YELLOW, LOW);
    digitalWrite(RED, HIGH);
}

```

2. Increase the delay time of Red and Green lights to 7 seconds

```

// variables
int GREEN = 8;
int YELLOW = 9;
int RED = 10;
int DELAY_GREEN = 7000;
int DELAY_YELLOW = 2000;
int DELAY_RED = 7000;

// basic functions
void setup()
{
    pinMode(GREEN, OUTPUT);
    pinMode(YELLOW, OUTPUT);
    pinMode(RED, OUTPUT);
}

void loop()
{
    red_light();
    delay(DELAY_RED);
    yellow_light();
    delay(DELAY_YELLOW);
    green_light();
    delay(DELAY_GREEN);
}

void green_light()
{
    digitalWrite(GREEN, HIGH);
    digitalWrite(YELLOW, LOW);
    digitalWrite(RED, LOW);
}

void yellow_light()
{
    digitalWrite(GREEN, LOW);
    digitalWrite(YELLOW, HIGH);
    digitalWrite(RED, LOW);
}

void red_light()
{
    digitalWrite(GREEN, LOW);
    digitalWrite(YELLOW, LOW);
    digitalWrite(RED, HIGH);
}

```

4. Activity 4

Paste the source code here!

1. Only flash the ODD Leds

```
/* Flash BRIGHT = Larsen scanner/Knight Rider easy-learner coding.
   By Neil Doherty 09/2019
   First, the Arduino Editor does not load these notes onto a board,
   it only loads the operating code.
   Pins are where you push jumper wires into.
*/

int LED3 = 3; // Each Arduino pin has a number or name.
int LED4 = 4; // Here, a value is assigned to the pins
int LED5 = 5; // numbered 3 to 12, using int (integer).
int LED6 = 6; // A jumper-wire connects each Arduino pin
int LED7 = 7; // to the positive/long leg of an LED
int LED8 = 8; // (L-ight E-mitting D-iode) on a 'breadboard'.
int LED9 = 9; // As it's name implies, an actual breadboard
int LED10 = 10; // was first used to tap pins into and wires
int LED11 = 11; // strung between, making connections.
int LED12 = 12;

const int DELAY = 50; // const int uses less memory than int.
                      // For this circuit all of them could use
                      // const int, but it illustrates both uses.
                      // The main difference is that with int,
                      // you can change the value inside the loop
                      // function which you will come to learn can
                      // be very useful, whereas const int cannot
                      // be changed.

void setup() {

  pinMode(LED3, OUTPUT); // pinMode is a command to the Arduino
  pinMode(LED4, OUTPUT); // to apply what is in the brackets.
  pinMode(LED5, OUTPUT); // < in this case, (LED5, set to transmit)
  pinMode(LED6, OUTPUT); // And so on for the others.
  pinMode(LED7, OUTPUT); // INPUT only applies to certain pins when
  pinMode(LED8, OUTPUT); // used.
  pinMode(LED9, OUTPUT);
  pinMode(LED10, OUTPUT);
  pinMode(LED11, OUTPUT);
  pinMode(LED12, OUTPUT);

  digitalWrite(12, LOW); // These commands switch all the LEDs
  digitalWrite(11, LOW); // to no power out. LOW meaning OFF
  digitalWrite(10, LOW); // HIGH meaning ON
  digitalWrite(9, LOW); // These lines make sure ALL LEDs are
```



```

digitalWrite(8, LOW); // off to begin with.
digitalWrite(7, LOW);
digitalWrite(6, LOW);
digitalWrite(5, LOW);
digitalWrite(4, LOW);
digitalWrite(3, LOW);
}

void loop() {

for(int i =3; i <=12; i+=2){
    digitalWrite(i, HIGH); // Switch LED attached to pin 12 on
    delay(DELAY);          // allowing the LED to light up HIGH
    digitalWrite(i, LOW);  // for a period of DELAY = 50
    delay(DELAY);
}
for(int i =12; i >=3; i-=2){
    digitalWrite(i, HIGH); // Switch LED attached to pin 12 on
    delay(DELAY);          // allowing the LED to light up HIGH
    digitalWrite(i, LOW);  // for a period of DELAY = 50
    delay(DELAY);
}
}

```

2. Only flash the EVEN Leds.

```

/* Flash BRIGHT = Larsen scanner/Knight Rider easy-learner coding.
   By Neil Doherty 09/2019
   First, the Arduino Editor does not load these notes onto a board,
   it only loads the operating code.
   Pins are where you push jumper wires into.
*/

int LED3 = 3; // Each Arduino pin has a number or name.
int LED4 = 4; // Here, a value is assigned to the pins
int LED5 = 5; // numbered 3 to 12, using int (integer).
int LED6 = 6; // A jumper-wire connects each Arduino pin
int LED7 = 7; // to the positive/long leg of an LED
int LED8 = 8; // (L-ight E-mitting D-iode) on a 'breadboard'.
int LED9 = 9; // As it's name implies, an actual breadboard
int LED10 = 10; // was first used to tap pins into and wires
int LED11 = 11; // strung between, making connections.
int LED12 = 12;

const int DELAY = 50; // const int uses less memory than int.
                      // For this circuit all of them could use
                      // const int, but it illustrates both uses.

```

```

// The main difference is that with int,
// you can change the value inside the loop
// function which you will come to learn can
// be very useful, whereas const int cannot
// be changed.

void setup() {

  pinMode(LED3, OUTPUT); // pinMode is a command to the Arduino
  pinMode(LED4, OUTPUT); // to apply what is in the brackets.
  pinMode(LED5, OUTPUT); // < in this case, (LED5, set to transmit)
  pinMode(LED6, OUTPUT); // And so on for the others.
  pinMode(LED7, OUTPUT); // INPUT only applies to certain pins when
  pinMode(LED8, OUTPUT); // used.
  pinMode(LED9, OUTPUT);
  pinMode(LED10, OUTPUT);
  pinMode(LED11, OUTPUT);
  pinMode(LED12, OUTPUT);

  digitalWrite(12, LOW); // These commands switch all the LEDs
  digitalWrite(11, LOW); // to no power out. LOW meaning OFF
  digitalWrite(10, LOW); // HIGH meaning ON
  digitalWrite(9, LOW); // These lines make sure ALL LEDs are
  digitalWrite(8, LOW); // off to begin with.
  digitalWrite(7, LOW);
  digitalWrite(6, LOW);
  digitalWrite(5, LOW);
  digitalWrite(4, LOW);
  digitalWrite(3, LOW);

}

void loop() {

for(int i =4; i <=12; i+=2){
  digitalWrite(i, HIGH); // Switch LED attached to pin 12 on
  delay(DELAY);          // allowing the LED to light up HIGH
  digitalWrite(i, LOW);  // for a period of DELAY = 50
  delay(DELAY);
}
for(int i =12; i >=3; i-=2){
  digitalWrite(i, HIGH); // Switch LED attached to pin 12 on
  delay(DELAY);          // allowing the LED to light up HIGH
  digitalWrite(i, LOW);  // for a period of DELAY = 50
  delay(DELAY);
}
}

```

Video of all challenges:

<https://drive.google.com/drive/u/0/folders/1nTOutLXG5RzvfXVfUpwRBBSt9xwYDVBD>