



# **SNS COLLEGE OF TECHNOLOGY**

**Coimbatore-35**

**An Autonomous Institution**

Accredited by NBA – AICTE and Accredited by NAAC – UGC  
with 'A+' Grade

Approved by AICTE, New Delhi & Affiliated to Anna  
University, Chennai

## **DEPARTMENT OF ELECTRONICS & COMMUNICATION ENGINEERING** **INTRODUCTION TO ARCHITECTING SMART IoT DEVICES**

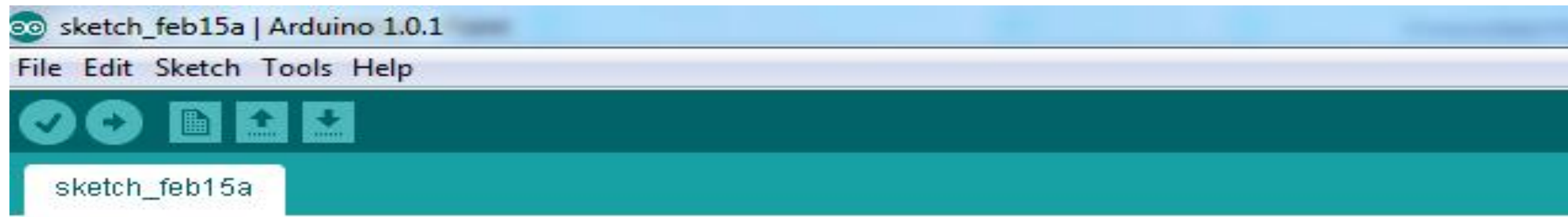
**II YEAR/ IV SEMESTER**

**UNIT 2 – MICROCONTROLLER AND INTERFACING TECHNIQUES FOR IoT DEVICES**

**TOPIC 1 – BASICS OF EMBEDDED C PROGRAMMING FOR ARDUINO**

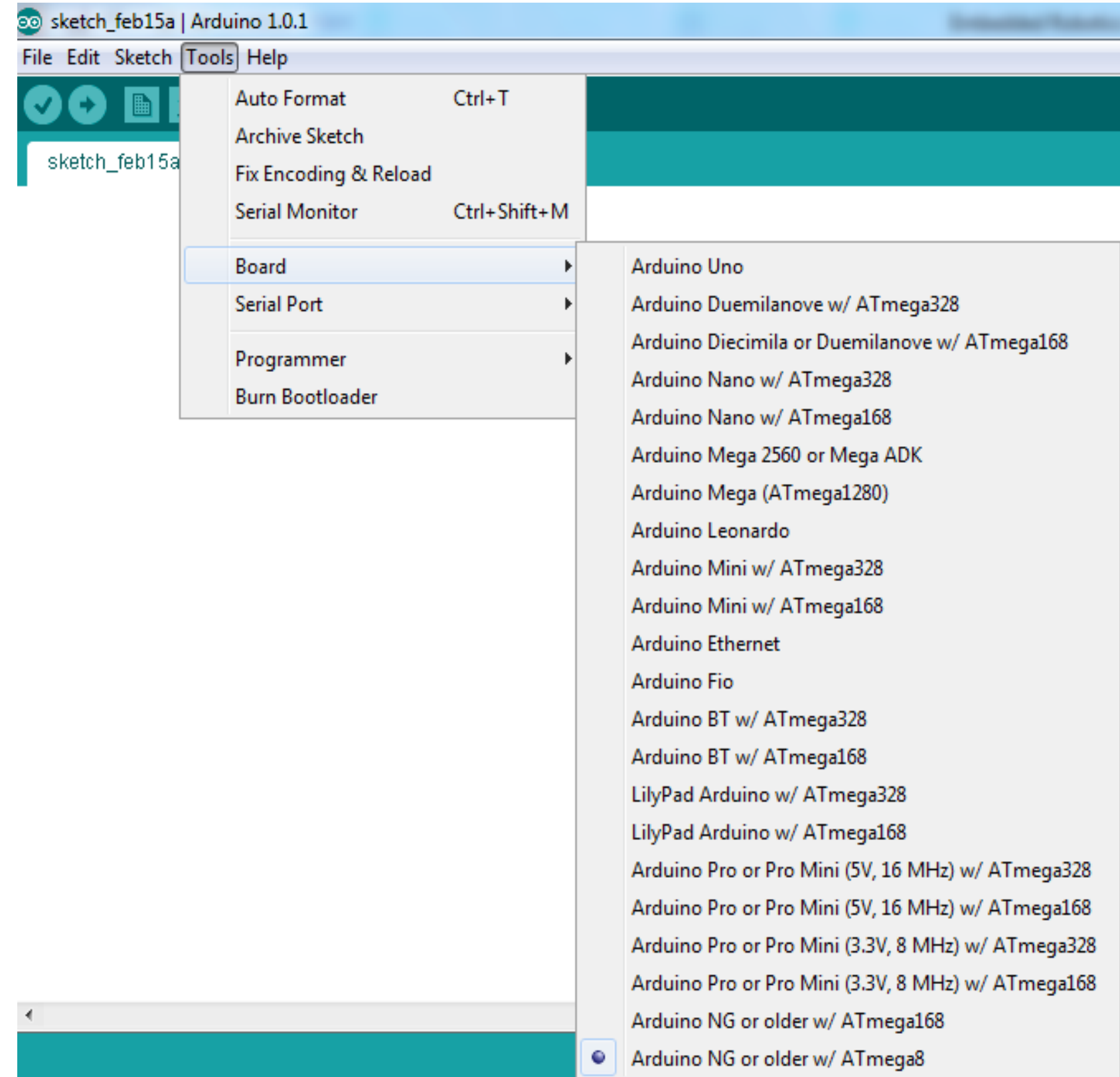
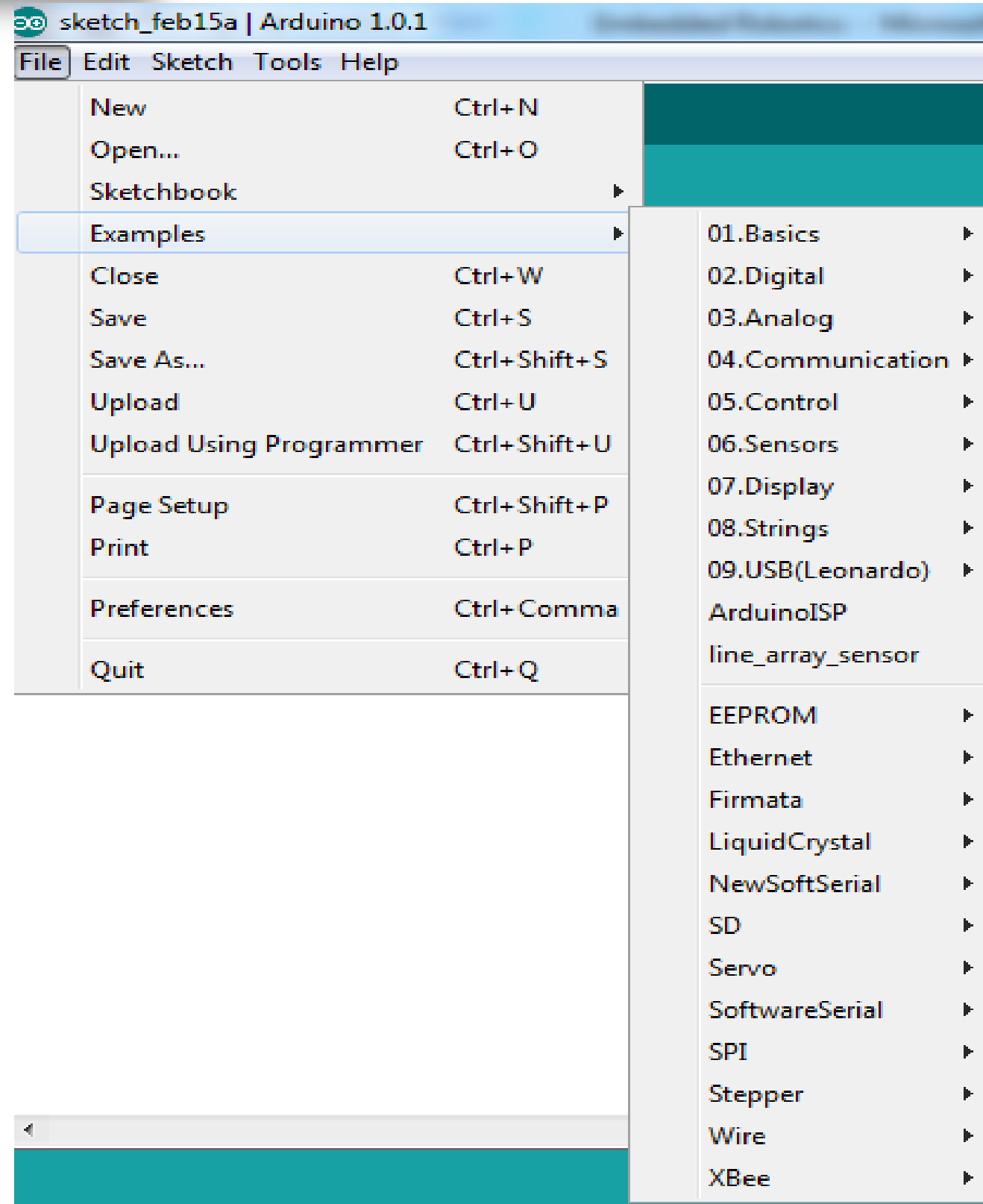


# ARDUINO IDE



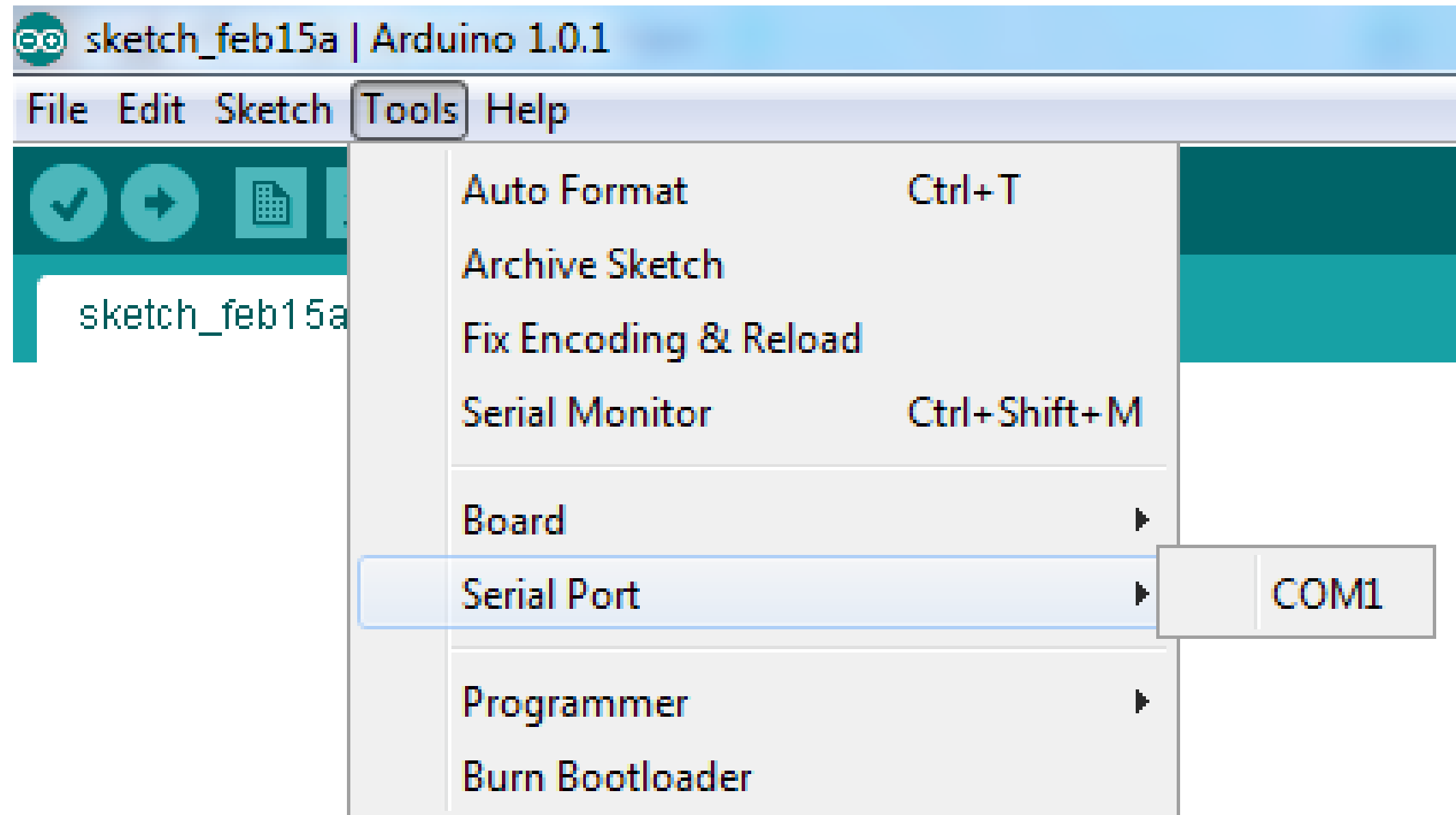


# ARDUINO IDE





# ARDUINO IDE





## FEATURES OF ARDUINO IDE



- Open-source
  - makes it easy - write code and upload it to the board.
- Runs on
  - Windows
  - Mac OS X
  - Linux
- C++ Based codes
- RTOS - Hard Task – Super Loop based approach



# ARDUINO GETTING STARTED



- Get an Arduino board and USB cable
- Download the Arduino environment
- Connect the board
- Install the drivers
- Launch the Arduino application
- Code Program for the application
- Select your board
- Select your serial port
- Upload the program



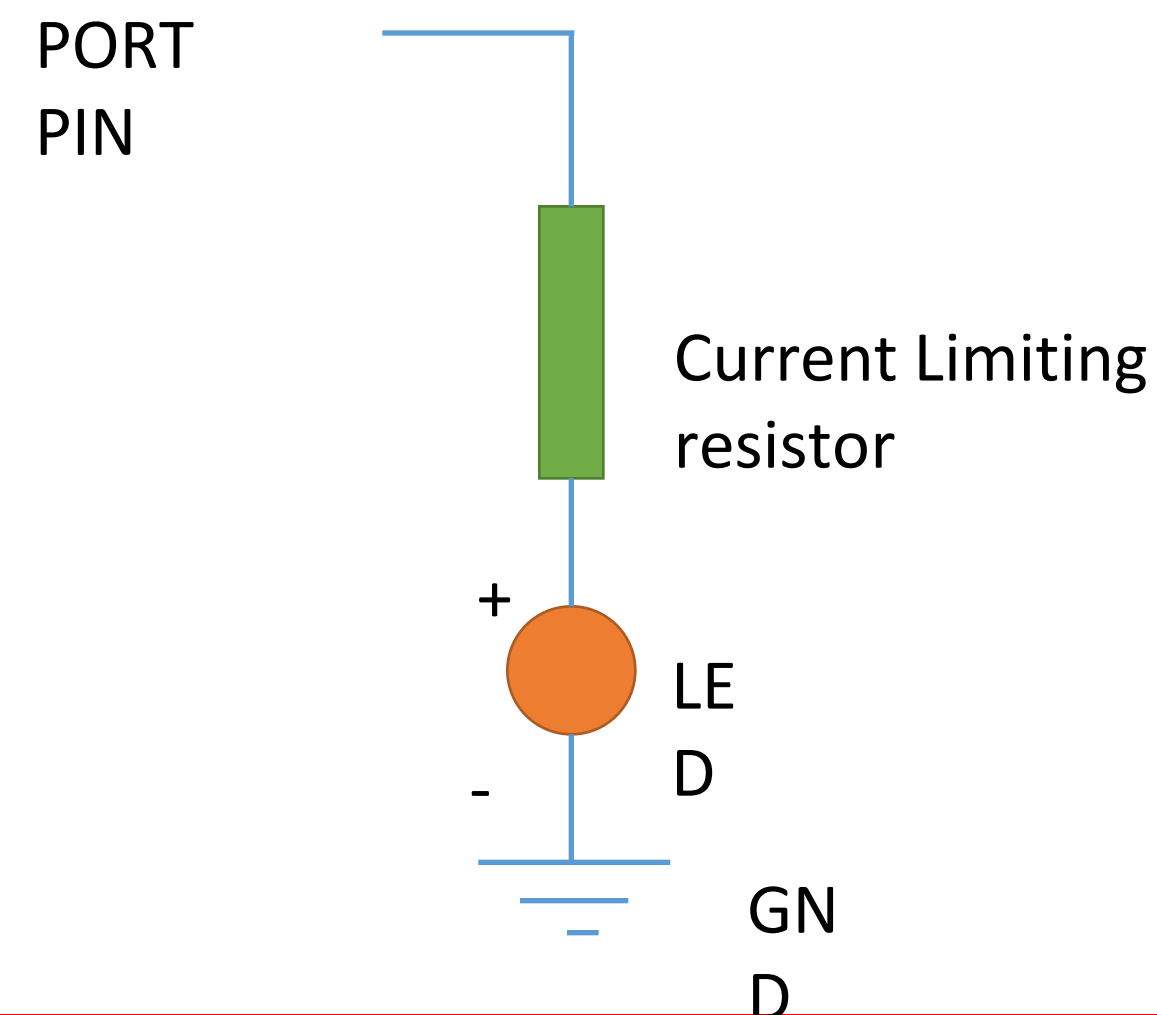
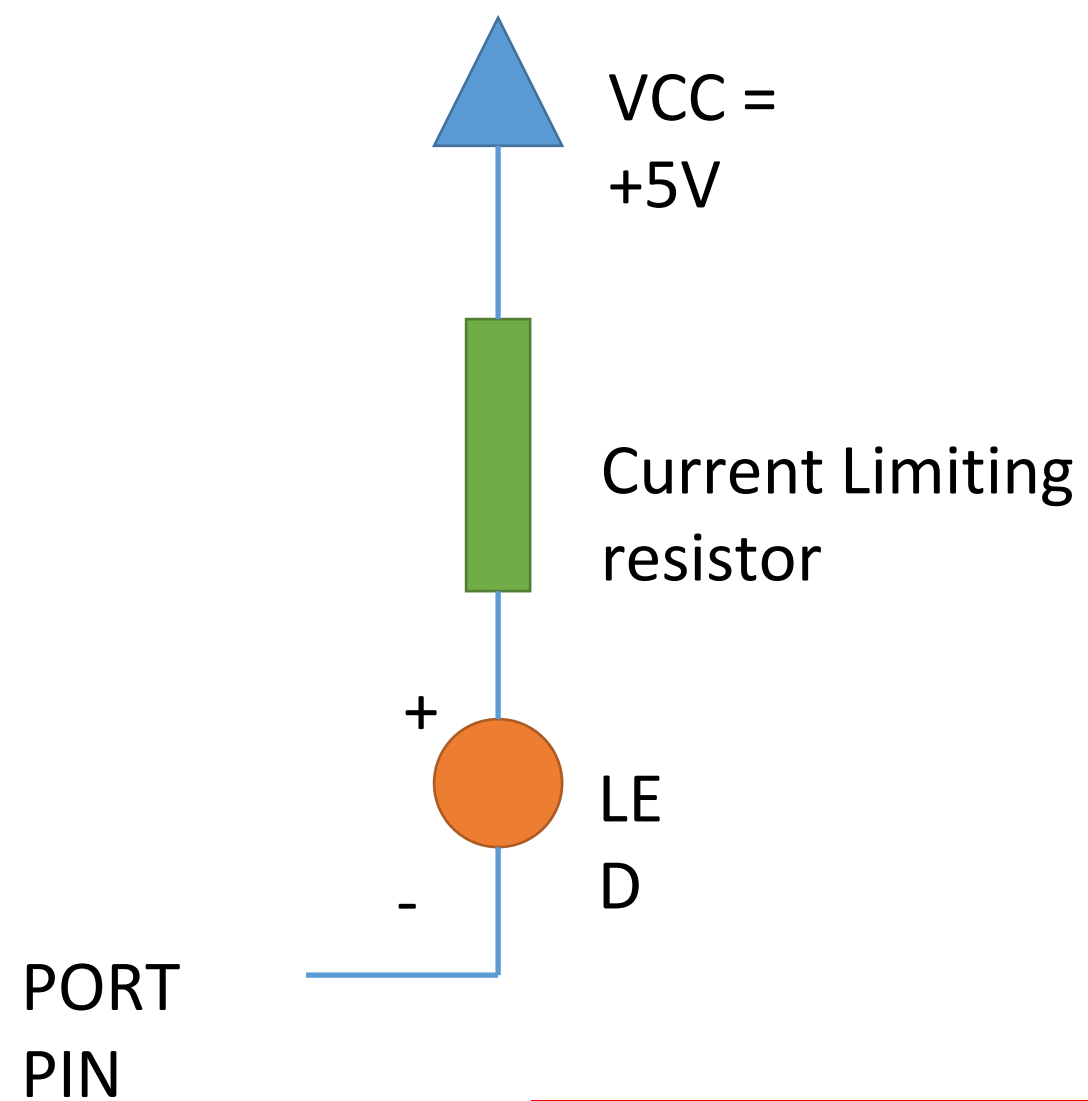


# ARDUINO CONNECTION PREREQUISITION



## Sinking Mode of Connection\*

## Source Mode of Connection-





# ARDUINO



## **Digital Output**

Blinking of a LED

Blinking of 2 LEDs in alternate fashion

## **Digital I/p and O/p**

LED controlled by button/switch

## **Digital O/p , Analog I/P and Serial monitor**

LED brightness controlled from potentiometer & viewed in serial monitor

LED ON/OFF controlled w.r.t comparison of threshold & analog value from potentiometer input



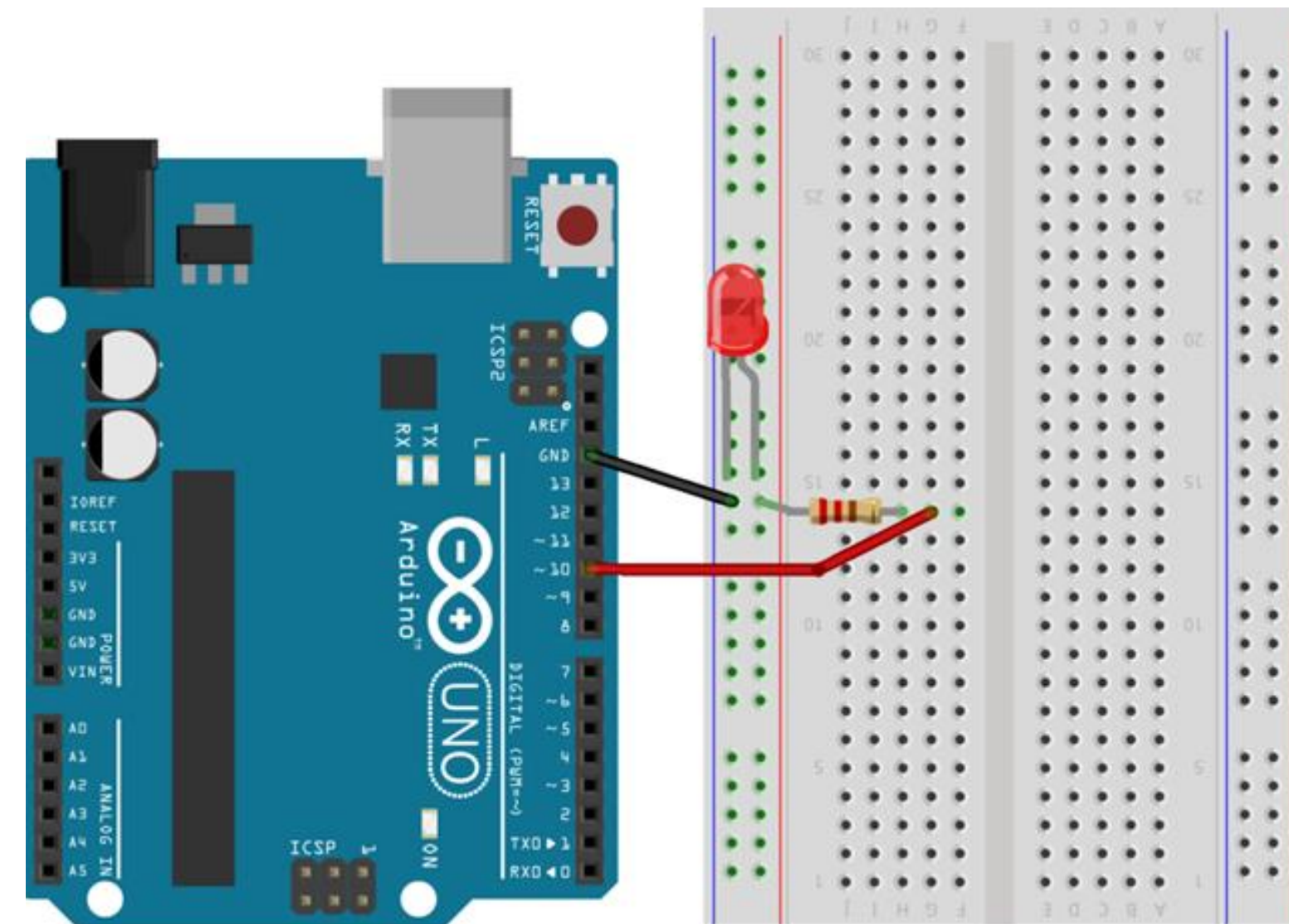


# ARDUINO HELLO WORLD



## Steps:

- Selection of digital Pins(2 to 13)
  - 13 has LED connected to it
- Pin configuration as Output
- Action of pin –
  - Digital O/p –
    - Write the value onto the pin
  - Digital I/p -
    - Read the value from pin





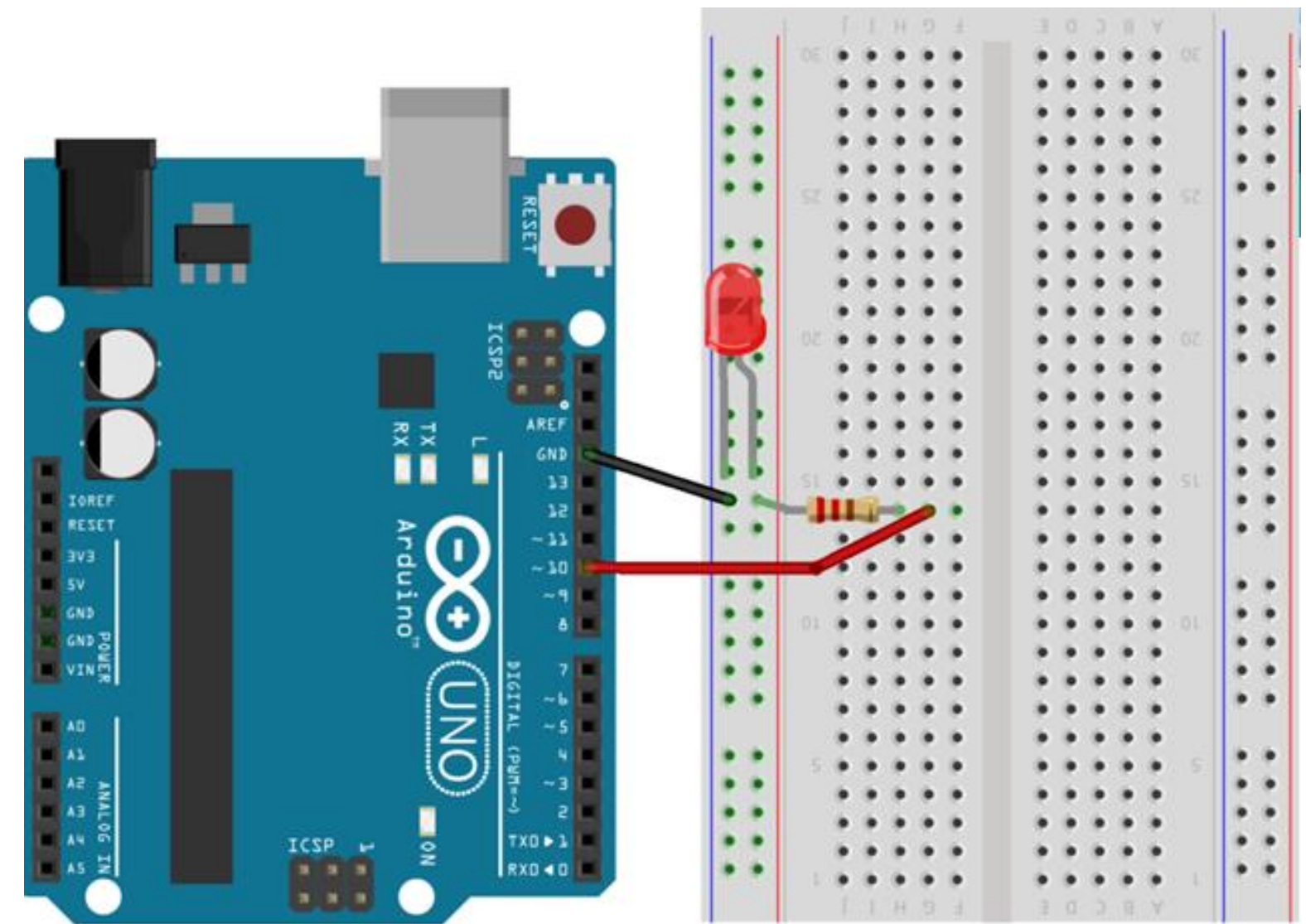
# ARDUINO PROGRAM



```
int LED = 9;

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

void loop()
{
  digitalWrite(LED, HIGH);
  delay(1000);
  digitalWrite(LED, LOW);
  delay(1000);
}
```

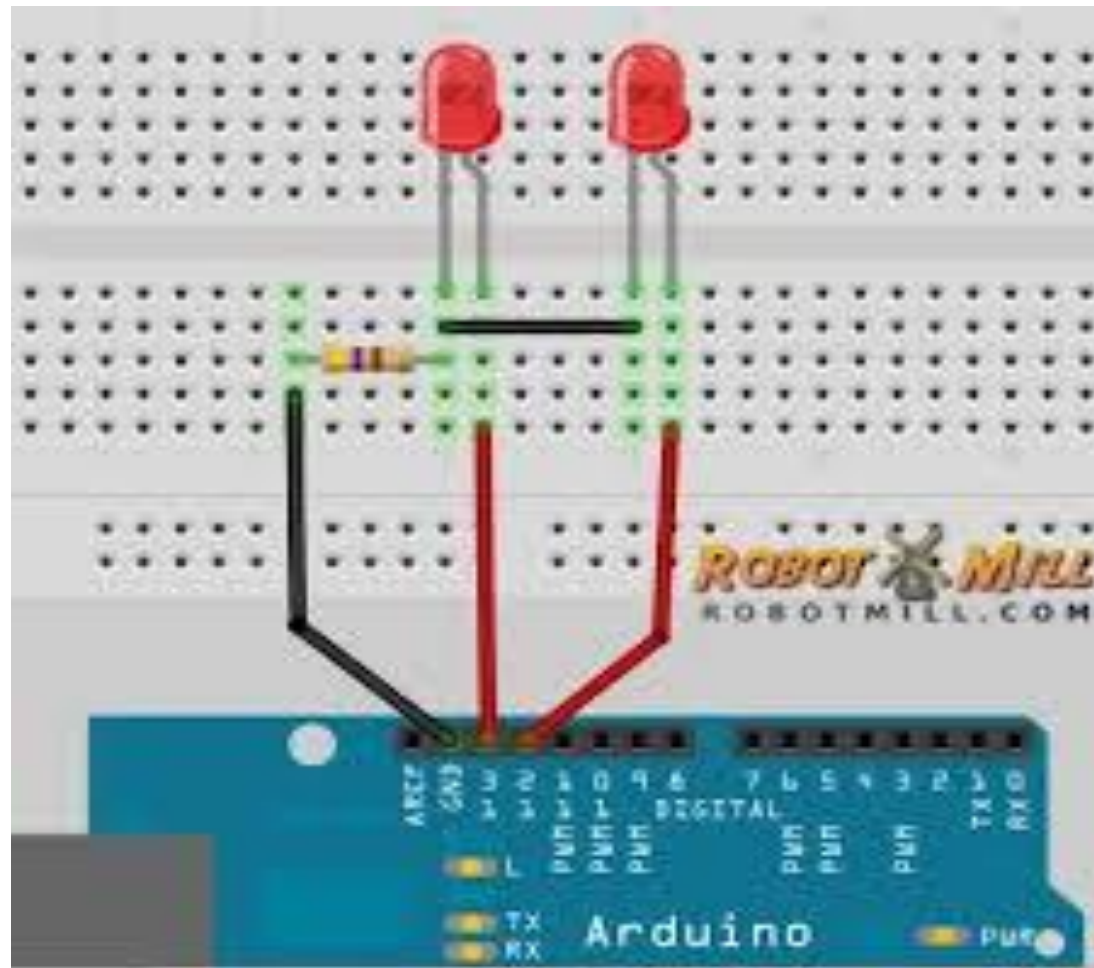




# ARDUINO PROGRAM



## BLINKING OF 2 LEDs IN ALTERNATE FASHION



**Resistor end1: Gnd**

**LED1 +ve : pin 8**

**LED2 +ve : pin 9**

**LED1 &2 -ve : Resistor end2**

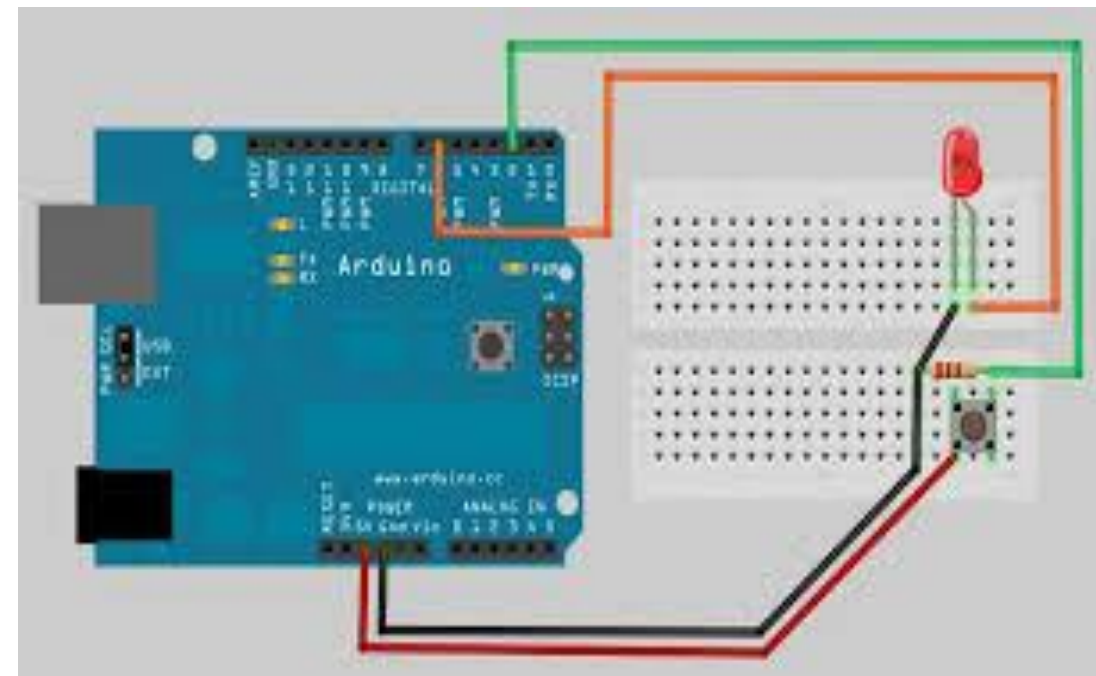
```
int LED1=8
int LED2 = 9;
void setup()
{
  pinMode(LED1, OUTPUT);
  pinMode(LED2, OUTPUT);
}
void loop()
{
  digitalWrite(LED1, HIGH);
  digitalWrite(LED2, LOW);
  delay(1000);
  digitalWrite(LED1, LOW);
  digitalWrite(LED2, HIGH);
  delay(1000);
}
```



# ARDUINO TASK-3



- **H/W circuit**



- Resistor end1: Gnd
- Button end1 :
- LED +ve : pin2
- LED -ve :
- Resistor end2 :
- Button end2 :

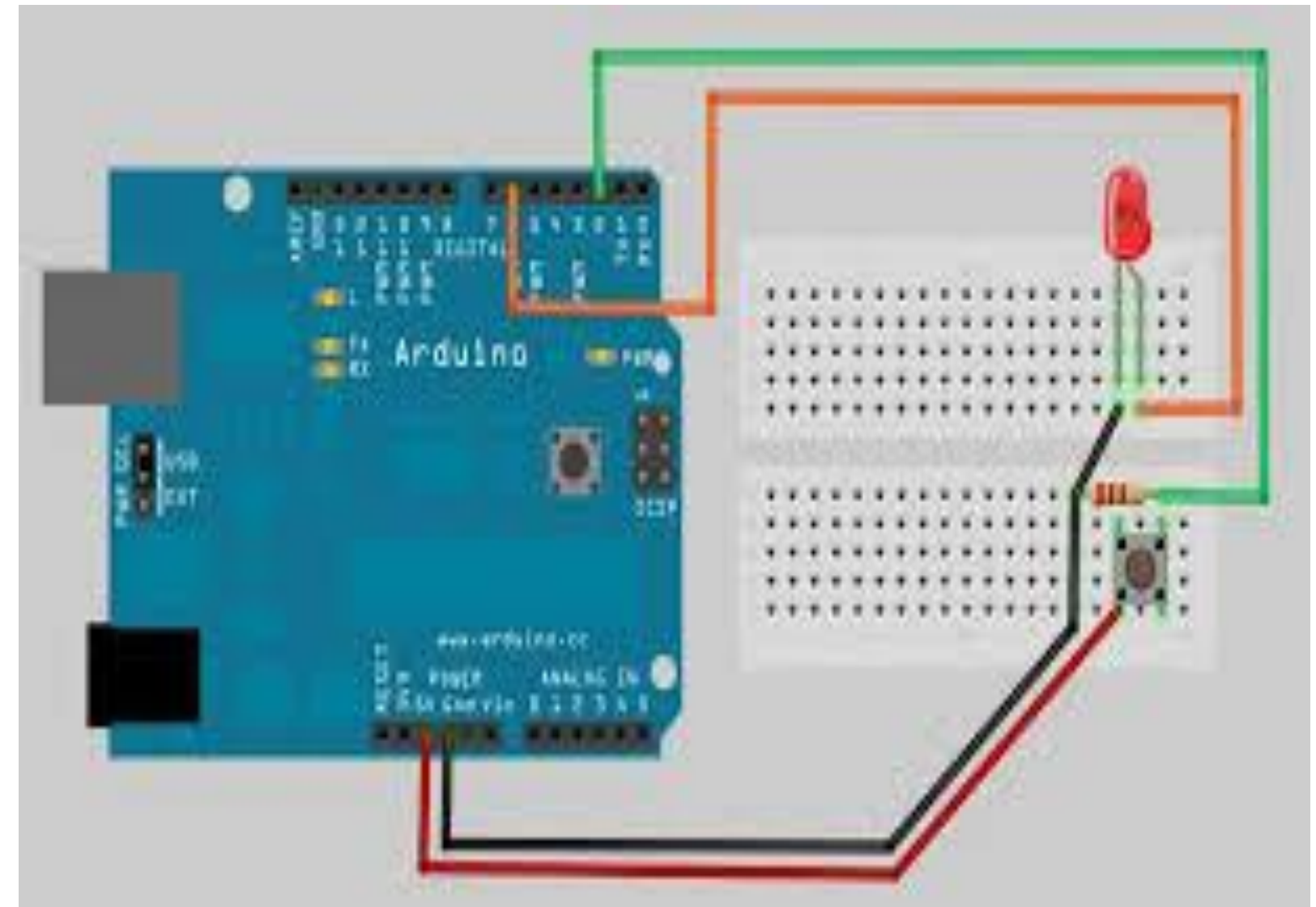


# ARDUINO PROGRAM



```
const int SWITCH = 3;
int LED1 = 8;

void setup()
{
  pinMode(LED1, OUTPUT);
}
void loop()
{
  if ( digitalRead(SWITCH) == HIGH)
  {
    digitalWrite(LED1, HIGH);
  }
  else
  {
    digitalWrite(LED1, LOW);
  }
}
```





*Thank  
You*