EE3704 Embedded System

Chapter 1

Presented by
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Introduction

- Arduino Board/Online Board
  - Arduino programming language
  - Arduino Software
  - Functions
    - Digital Input/Output
    - Serial Communication
    - Analog Input/Output
    - PWM
    - Interrupts
- Communication / Control by Application (Android)

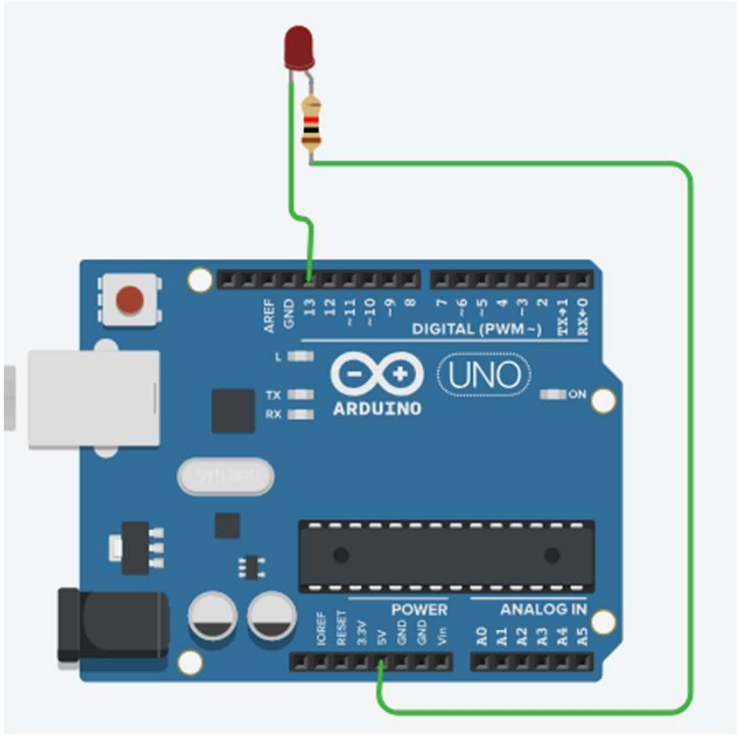
Course Outline

- Chapter 1: Introduction to Arduino Board
  - Overview
- Chapter 2: Digital Output
  - Active High / Active Low
  - LED and 7 – segment (CC/CA)
- Chapter 3: Digital Input
  - Active High / Active Low
- Chapter 4: Serial Communication
  - Input/Reading/Writing Status

Course Outline

- Chapter 5 : Analog Input
  - Reading Analog Input Value
- Chapter 6 : PWM
  - PWM functions and applications
- Chapter 6.5: Printed Circuit Board design (PCB)
  - Basic design with AutoDesk
- Chapter 7 : Interrupts
  - Timer
  - External
- Chapter 8 : Wifi Module Communication and applications via Android

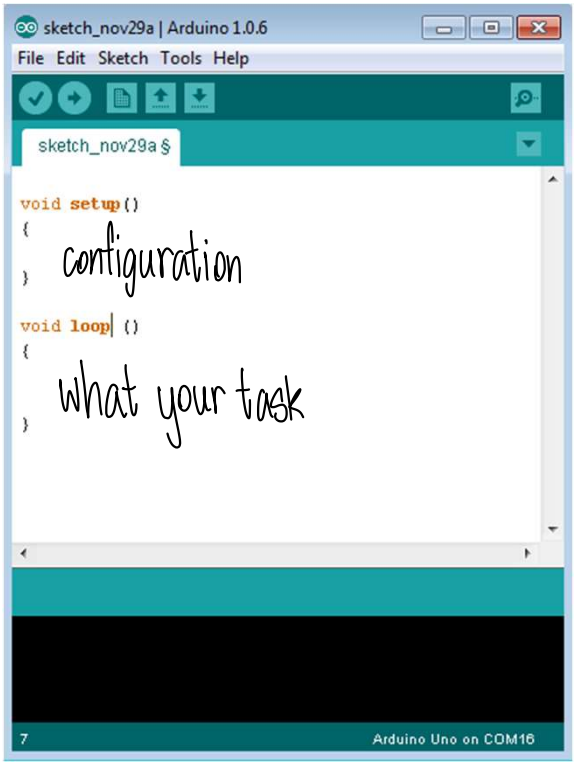
Chapter 1: Introduction to Arduino online

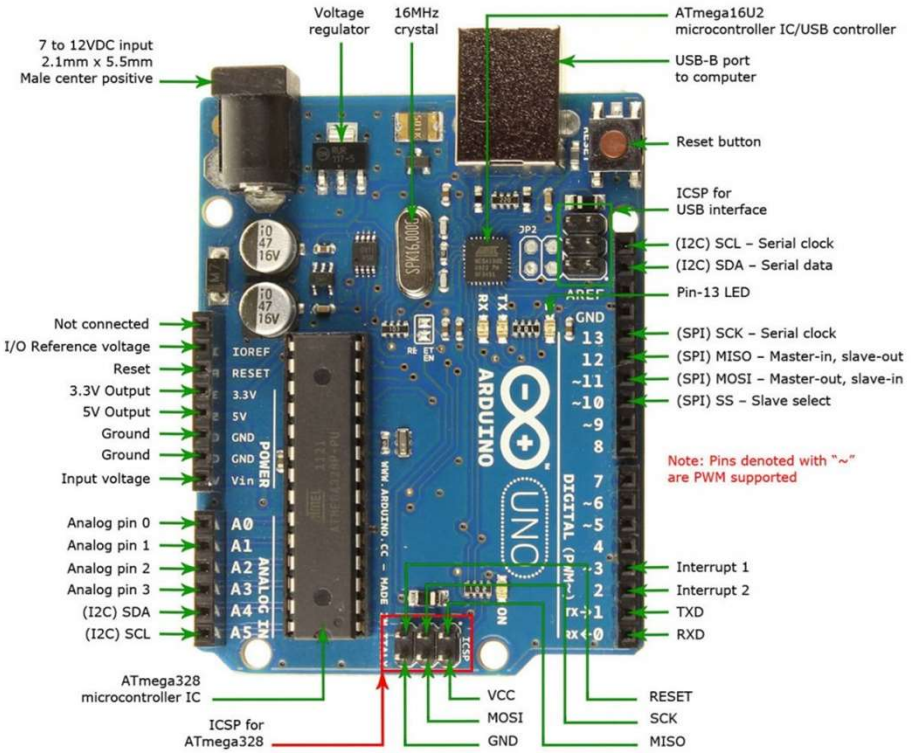


+ Go to “Tinkercad” website and register for online Arduino

+ Internet access is required

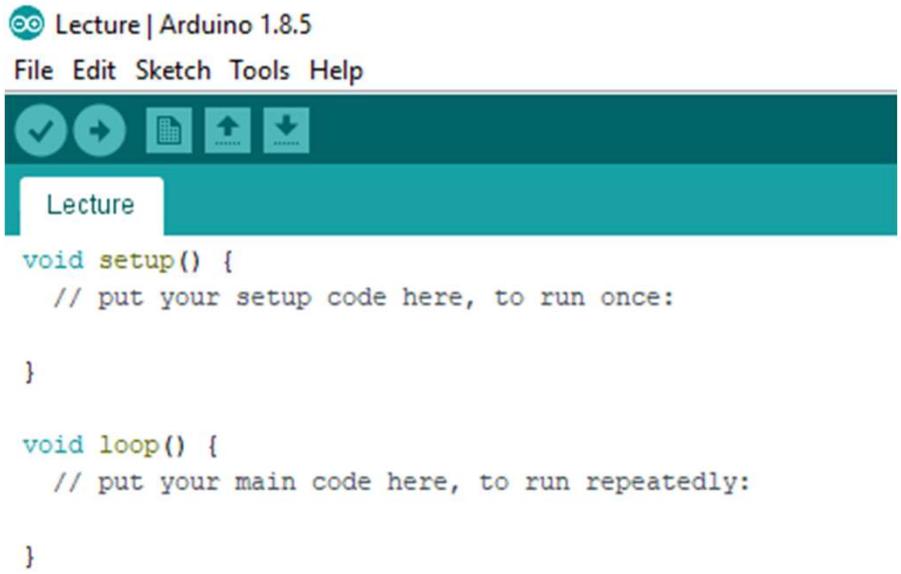
Chapter 1: Introduction to Arduino Board





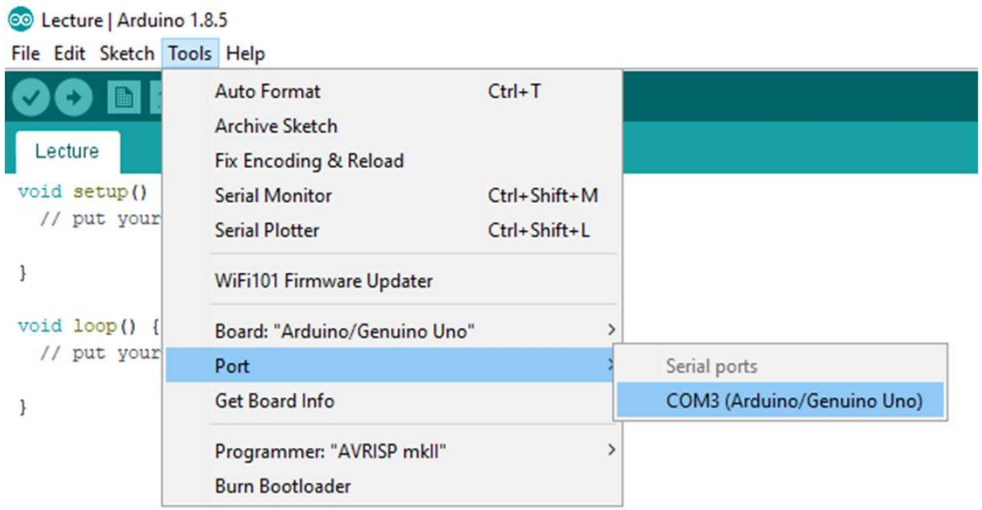
Chapter 1: Introduction to Arduino Board

- Start Arduino Program



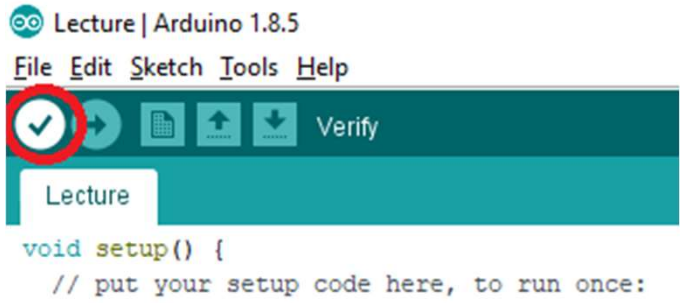
Chapter 1: Introduction to Arduino Board

- Check Connection Port
  - USB com port number



Chapter 1: Introduction to Arduino Board

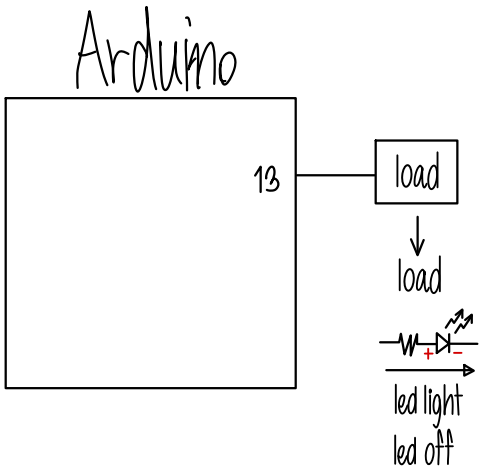
- Verify and Upload Empty Program to Arduino Board



Chapter 1: Introduction to Arduino Board

Example 1.1

- Try Basic Command to Arduino Board
  - Turn On/Off onboard LED (Pin 13) for 1 second
  - delay function is delay(ms);



Data types

Type	Value Range	Comments
char	–128 to 127	
unsigned char	0 to 255	
int	–32,768 to 32,767	16-bit
Dint	–2,147,483,648 to 2,147,483,647	32-bit
unsigned int	0 to 65,535	16-bit
Dunsigned int	0 to 4,294,967,295	32-bit
short int	–32,768 to 32,767	
unsigned short int	0 to 65,535	
long int	–2,147,483,648 to 2,147,483,647	
unsigned long int	0 to 4,294,967,295	
float	1.17×10^{-38} to 3.40×10^{38}	6-digit precision
double	2.22×10^{-308} to 1.79×10^{308}	15-digit precision

for

Syntax

The syntax of a **for** loop in C programming language is –

```
for ( init; condition; increment ) {
   statement(s);
}
```

Example :

```
for( a = 10; a < 20; a = a + 1 ){
   printf("value of a: %d\n", a);
}
```

10–19

```
for (a = 20; a>10; a = a - 1) {
printf("value of a: %d\n", a);
}
```

19–10

Chapter 1: Introduction to Arduino Board

Example 1.2

- Turn On onboard LED (Pin 13) for 2 second
- Then Turn Off onboard LED (Pin 13) for 1 second
- Do it 5 time (On and Off)
- The onboard LED (Pin 13) turn Off

Chapter 1: Introduction to Arduino Board

- Example 1.3
  - Turn On LED (Pin 12) for 2 second
  - Then Turn Off LED (Pin 12) for 1 second
  - Do it 5 time (On and Off)
  - The LED (Pin 12) turn Off