ARDUINO

↳ It was developed by **Ivrea Interaction Design Institute** as an easy tool for fast prototyping.

Arduino community aims at designing and utilizing microcontroller-based development boards, known as Arduiono modules, which are open-source prototyping platforms.

[It offers from 8 bit boards to products for IoT, Wearable, 3D printing & embedded enviornments.]

Arduino baards are able to read inputs like,
- → light on a Sensor
- → A finger on a button
- → twitter message - & turn it into an output
- → activating a motor
- → turning on a LED.
- → publishing something Online.

tell your Board what to do by sending a set of instructions to the microcontroller on the board.

ARDUINO IDE — Integrated Development Enviornment.
It is open Source S/w.
It is text Edior.

Feature of Arduino IDE

- ✓ It supports all (A) boards.
- ✓ It has Built in library manager

Word file is called — DOCUMENT

Arduino file is called — Sketch

Sketch has file extension like — .ino

(It has features like cut / copy / paste)

INITIAL SETUP for Arduino IDE

Download Arduino IDE —

https://www.arduino.cc/en/Main/Software

for (Win 10) — we have app Version.

INSTALL it to your System.

→ Plug in your ARDUINO BOARD to your PC via USB cable.

Green power LED will light up.

⇒ Now Open your IDE

Arduino UNO
Mega
NaNo

configure the Board & port Setting

TOOLS ⟶ Board // Select your Board.

TOOLS ⟶ SERIAL PORT ⟶ com 1 → reserved for H/w serial port
com 2
com 3

FILE (New | Open | Sketchbook | Examples | Clos
save | page setup · | print | Quit.

Parts of IDE
- Menu Bar
  - Edit (
  - Sketch ⟶ Verify | Compile | Upload
  - Tools ⟶ Board / Port.
  - Help.
- Tool Bar
- Text Editor
- Output Panel.

Sketch — Editor Area

Steps to Write Arduino Program

- create new Sketch

  File ---> New

- // Single line Comment.

- /*
  ~~~~
  ~~~~ multi line Comment.
  ~~~~
  */

- Press Alt + T for Auto-Indent the whole Sketch.

- define Global variable

  constant Names are given to different Arduino Pins.

  "A variable is a place for storing piece of data"

  It has (name, type, Value).

```
int ledPin = 13  //LED connected to pin 13
```

type — name — initial value
  ~~~~

setup f^n

Arduino begins setup function

The setup( ) function (starts) is called when the Sketch starts.

> Every Arduino sketch must have a setup function

The setup( ) function will only run once, after each power up or reset of the Arduino board.

The Serial communication is initiated under setup( )

→ Pin functionality using (pinMode) function

→ Initial State of Pins

→ Initialize classes

→ Initialize Variables.

→ Code logic

loop f^n

The loop( ) f^n is also a must for every Arduino Sketch gt executes once setup( ) is complete.

Example:

```
Void loop()
{
  digitalWrite( ledPin, High ); // sets the digital Pin 13 on
    delay ( 1000 );             // wait for a Second.
  digitalWrite ( ledPin, Low ); // sets the digital Pin 13 off.
    delay ( 1000 );
}
```

after the setup() function & loop() function, there are other user defined functions which only activated when called in the setup() & loop() routine.

COMPILING

After writing the sketch/ script it needs to be converted into instructions that can be read & executed by **Arduino Controller Chip**

It is called compiling

Sketch → Verify/ Compile

after Compilation an additional msg will show/ pop up to your Console Screen

→ Binary Sketch size 1208 bytes (of a 32256 byte maximum).