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Experiment No. 2

Aim : To study & Installation of Arduino IDE Board.

Objective:

1. To study installation of Arduino Programming.
2. To understand the Arduino IDE Environment.

Outcome: Able to write program for Sensor, Actuator

Theory :

The Arduino software is easy-to-use for beginners, yet flexible enough for advanced users. It runs on Mac, Windows, and Linux. Teachers and students use it to build low cost scientific instruments, to prove chemistry and physics principles, or to get started with programming and robotics. Designers and architects build interactive prototypes, musicians and artists use it for installations and to experiment with new musical instruments. Makers, of course, use it to build many of the projects exhibited at the Maker Faire, for example. Arduino is a key tool to learn new things.

Arduino is an open-source electronics platform based on easy-to-use hardware and software. Arduino boards are able to read inputs - light on a sensor, a finger on a button, or a Twitter message - and turn it into an output - activating a motor, turning on an LED, publishing something online. You can tell your board what to do by sending a set of instructions to the microcontroller on the board. To do so you use the Arduino programming language (based on Wiring), and the Arduino Software (IDE), based on Processing.

Types of Arduino :

Arduino UNO : The development of Arduino UNO board is considered as new compared to other Arduino boards. This board comes up with numerous features that help the user to use this in their project. The Arduino UNO uses the Atmega16U2 microcontroller that helps to increase the transfer rate and contain large memory compared to other boards. No extra devices are needed for the Arduino UNO board like joystick, mouse, keyboard

and many more. The Arduino UNO contains SCL and SDA pins and also has two additional pins fit near the RESET pin.

LilyPad Arduino : The LilyPad Arduino is considered as another Arduino board type that is designed for integrating with wearable projects and e-textile projects. This board comes in a round shape that helps to decrease the snagging and can be easily connected to other devices. This board uses the Atmega328 microcontroller and Arduino bootloader in it. This board uses very few external components in it that makes the design easy and compatible.

Arduino Mega : This board is considered as the microcontroller that uses the Atmega2560 in it. There are a total 54 input pins and output pins in it in which 14 pins are of PWM output, 4 pins are of hardware port, 16 pins as analog inputs. The board also contains one USB connection, ICSP header, power jack and one REST pin.

Arduino Leonardo : This board is considered as the microcontroller that uses the Atmega32u4 in it. There are a total of 20 digital input pins and output pins in it, in which 7 pins are used As PWM and 12 pins are used as analog inputs. The board also contains one micro USB connection, power jack, and one RESET button fit in it. There are additional pins which act as crystal oscillators of frequency 16 MHz.

Arduino Red Board : The Arduino Red board is another type of Arduino board that uses the mini USB cable for getting programmed and the Arduino IDE is used for this purpose. This board is compatible with Windows 8 operating system and there is no need to change the security settings to make this board working.

Arduino Shields : The Arduino shields are considered as pre-build circuit boards that are used to connect other Arduino boards. The Arduino shields are placed on top of Arduino boards and enhance the capability of the board to get connected to the internet network, controlling the motor, controlling the LCD and also help to establish wireless communication.

Conclusion : Thus, we learnt about the usage of Arduino, its importance, its usage and also about its various types.