Experiment: 1.1

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AIM: *To Assemble Arduino Uno with the system and perform necessary software installation.*
Objectives:
1. To study hardware and software related to IoT

2. To understand the function of Arduino Uno and other controllers.

Components Used:

    1. Arduino Uno
    2. Connecting Cable
   *3. Arduino Ide*

Theory:

Arduino Board
Arduino Board: Arduino boards are open-source microcontrollers used for creating electronicprojects. They have digital and analog pins for connecting sensors and devices. You programthem using the Arduino IDE and the C++ language

Features:
* *Microcontrollers for processing.*
* *Digital and analog pins for connecting devices.*
* *Programmed using Arduino IDE with C++.*
* *Supportive community and libraries.*
* *Various models for different needs.*

Pins:

* ***Digital Pins:*** *Input/output for digital signals (0 or 1).*
* ***Analog Pins:*** *Input for analog signals (continuous range of values).*
* ***Power Pins:*** *Provide power to the board (5V, 3.3V, GND).*
* ***Communication Pins***: *Transmit and receive data (UART, SPI, I2C).*
* ***Special Pins:*** *PWM (Pulse Width Modulation) for controlling analog-like output and other special functions.*
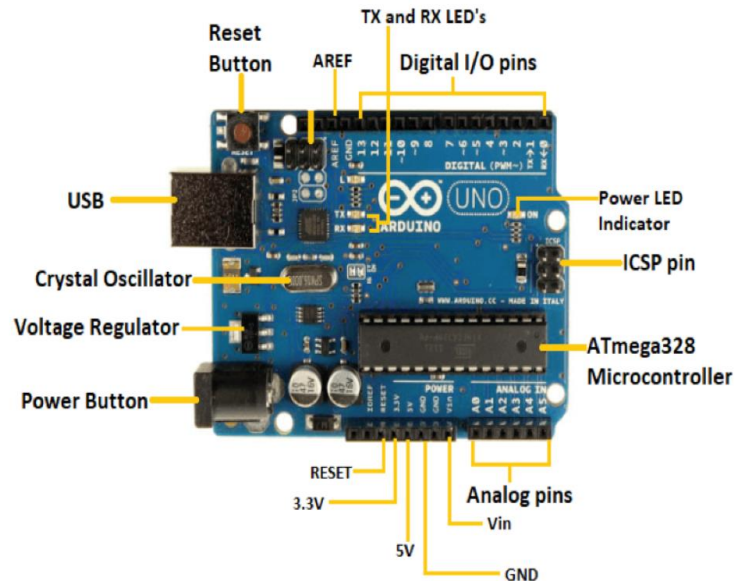
Basic Adruino functions are:

- *digitalRead(pin):* Reads the digital value at the given pin.
- *digitalWrite(pin, value):* Writes the digital value to the given pin.
- *pinMode(pin, mode):* Sets the pin to input or output mode.
- *analogRead(pin):* Reads and returns the value.
- *analogWrite(pin, value):* Writes the value to that pin.
- *serial.begin(baud rate):* Sets the beginning of serial communication by setting the bit rate.

RASPERRY PI

Raspberry Pi is a compact, affordable computer board offering versatile features. It boasts GPIO pins for hardware interfacing, making it suitable for DIY electronics projects. With HDMI output, USB ports, and Wi-Fi capability, it supports coding, browsing, and multimedia tasks. Its low cost and diverse community make it a popular choice for learners and tinkerers.
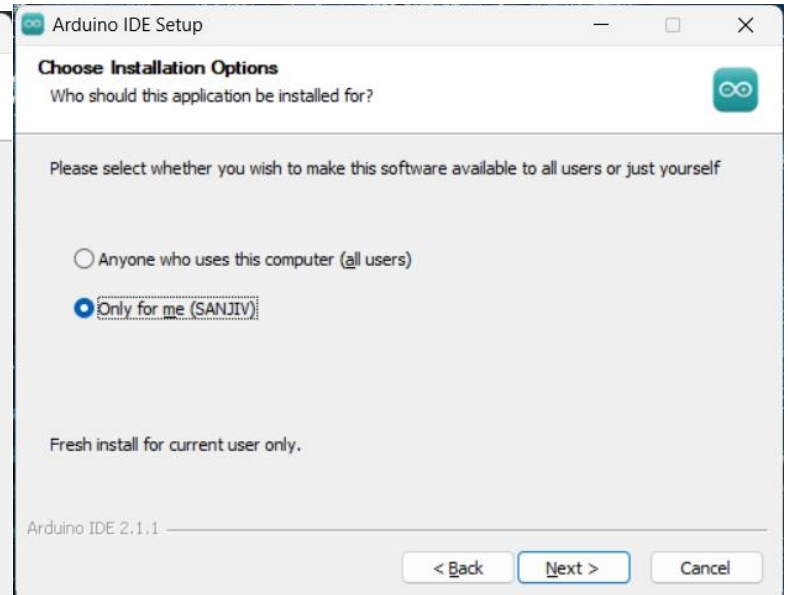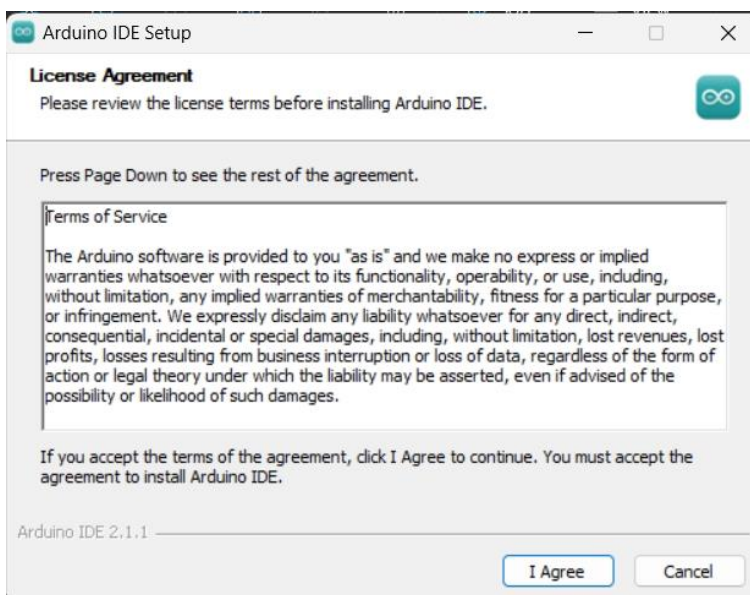
Features

- *Affordable single-board computer.*
- *HDMI output for connecting to displays.*
- *USB ports for peripherals like keyboards, mice, and storage.*
- *Wi-Fi and Ethernet connectivity options.*
- *Various operating systems, including Raspberry Pi OS (formerly Raspbian).*
- *Supports programming languages like Python, Scratch, and more.*
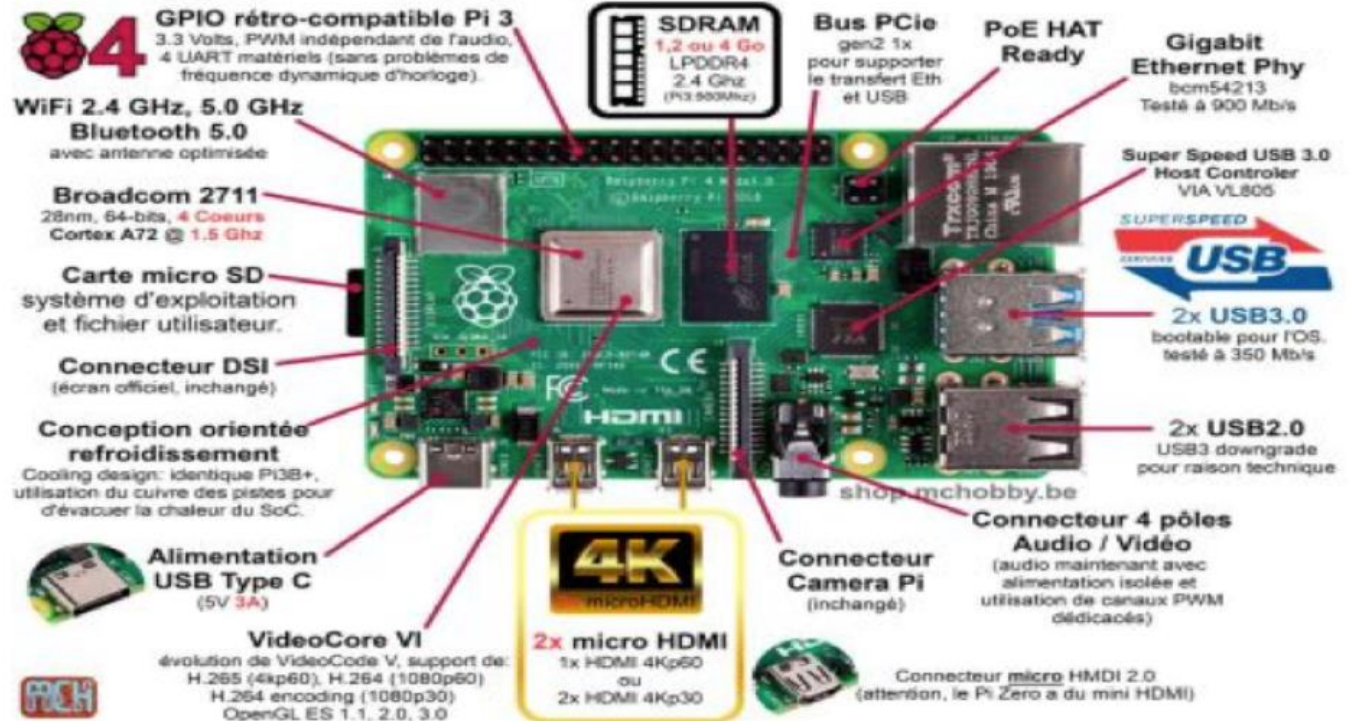
Steps to install Arduino Ide:

- ✓ *Visit Arduino.cc*
- ✓ *Select the ide and download it*
- ✓ *After downloading install the ide*
- ✓ *Now agree the required things which shown below:*