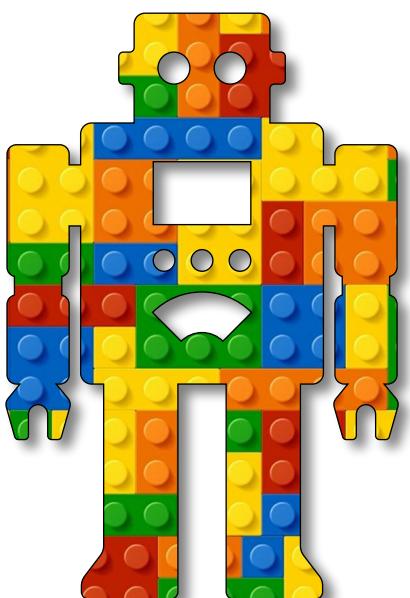


Intelligent Machines

Module A

Unit #2

the software





Module A unit #2 software

Introduction to the software needed

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Introduction to the software needed

To put code onto your device, in this case the **Arduino Nano 33 BLE**, you need a bit of software to help you. This is called an **IDE**, which stands for:

“Integrated Development Environment, a software application that combines common tools for writing and testing software code into a single graphical user interface (GUI). It streamlines the development process by providing a central platform for tasks like editing source code, debugging, and building applications, making developers more productive”.

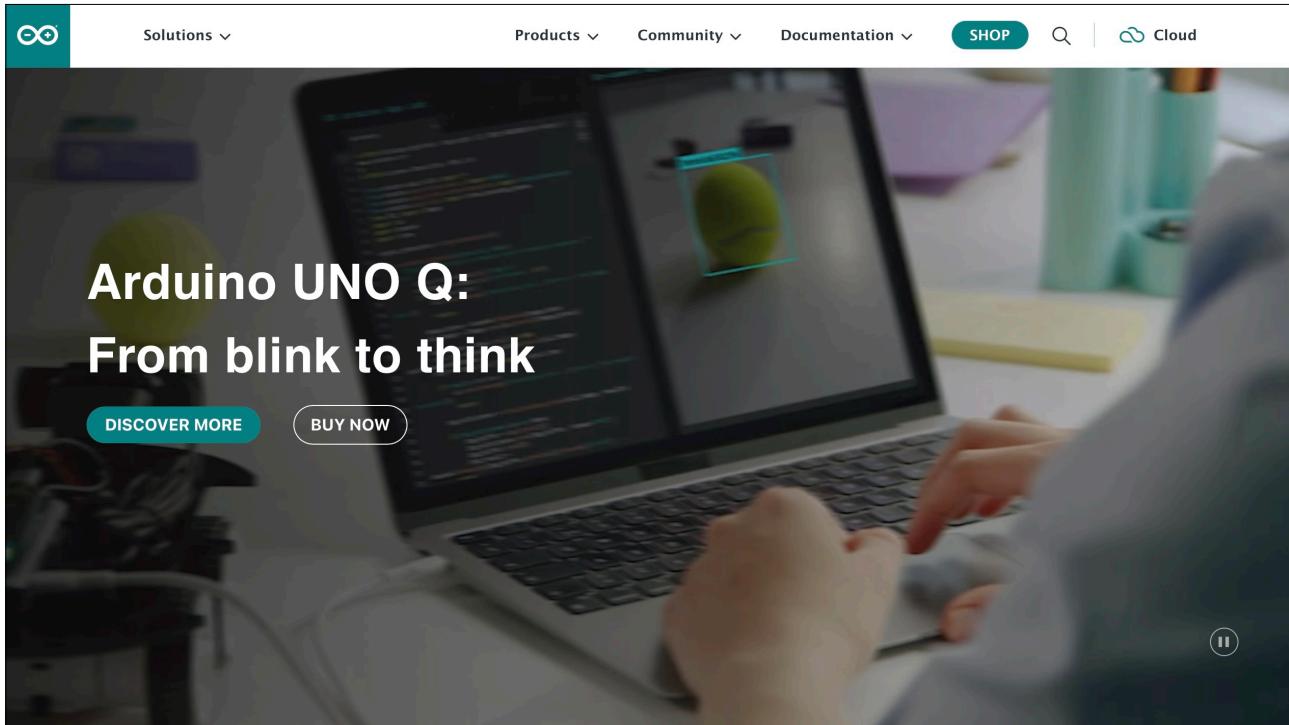
In other words, this is where you type in your code and send it to your device. An IDE can use any user-friendly language. It interprets what you write and converts it into meaningful code for the device. The coding language we are going to be using for the Arduino IDE is C/C++. It is very similar in format to p5.js.



The home page

You will need to download the software to upload the computer code to the Nano. Go to the Arduino website at: <https://www.arduino.cc/>

Figure 1: Arduino home page





The products

And click on the **Products** tab and then click on the **Arduino IDE**.

Figure 2: Arduino IDE

The screenshot shows the Arduino website's product page. At the top, there are tabs for 'For Professionals', 'For Education', 'For Makers', 'Products', 'Community', 'Documentation', 'SHOP', a search bar, and a 'Cloud' icon. The 'Products' tab is currently selected. The page is divided into 'HARDWARE' and 'SOFTWARE' sections. Under 'HARDWARE', there are categories like 'BOARDS, SOMs and SBCs', 'KITS', and 'ALL HARDWARE'. Under 'SOFTWARE', there are categories like 'CLOUD AND TOOLS', 'ARDUINO CLOUD', 'ARDUINO CLOUD EDITOR', 'ARDUINO CLI', 'ARDUINO IDE', 'PLC IDE', 'APP', 'SCIENCE JOURNAL', and 'IoT REMOTE'. A large box highlights the 'ARDUINO IDE' section, which includes a preview image of the IDE interface, a title 'Arduino IDE', a subtitle 'Discover all the features of our most popular programming tool', and a 'View' button. Below this, there are other sections for 'ARDUINO CLOUD', 'ARDUINO APP LAB', and 'SCIENCE JOURNAL'.



Download Arduino IDE

Then download the appropriate one for your operating system. You will see that there is a version **2.3.6** (as of writing).

Figure 3: download IDE

Bring Your Projects to Life with Arduino Software

Arduino IDE 2.3.6
Release notes

The new major release of the Arduino IDE is faster and even more powerful! In addition to a more modern editor and a more responsive interface it features autocompletion, code navigation, and even a live debugger. For more details, check the [Arduino IDE 2.0 documentation](#).

macOS Intel 10.15 Catalina or newer (64-bit) [DOWNLOAD](#)

Nightly Builds
Download a preview of the incoming release with the most updated features and bugfixes.

The Arduino IDE 2.0 is open source and its source code is hosted on [GitHub](#).



The icon

Once you have downloaded the software (you may be given the option to donate, but you don't have to), open it up. You should have a symbol like this. Click on it to open it up.

Figure 4: Arduino IDE icon



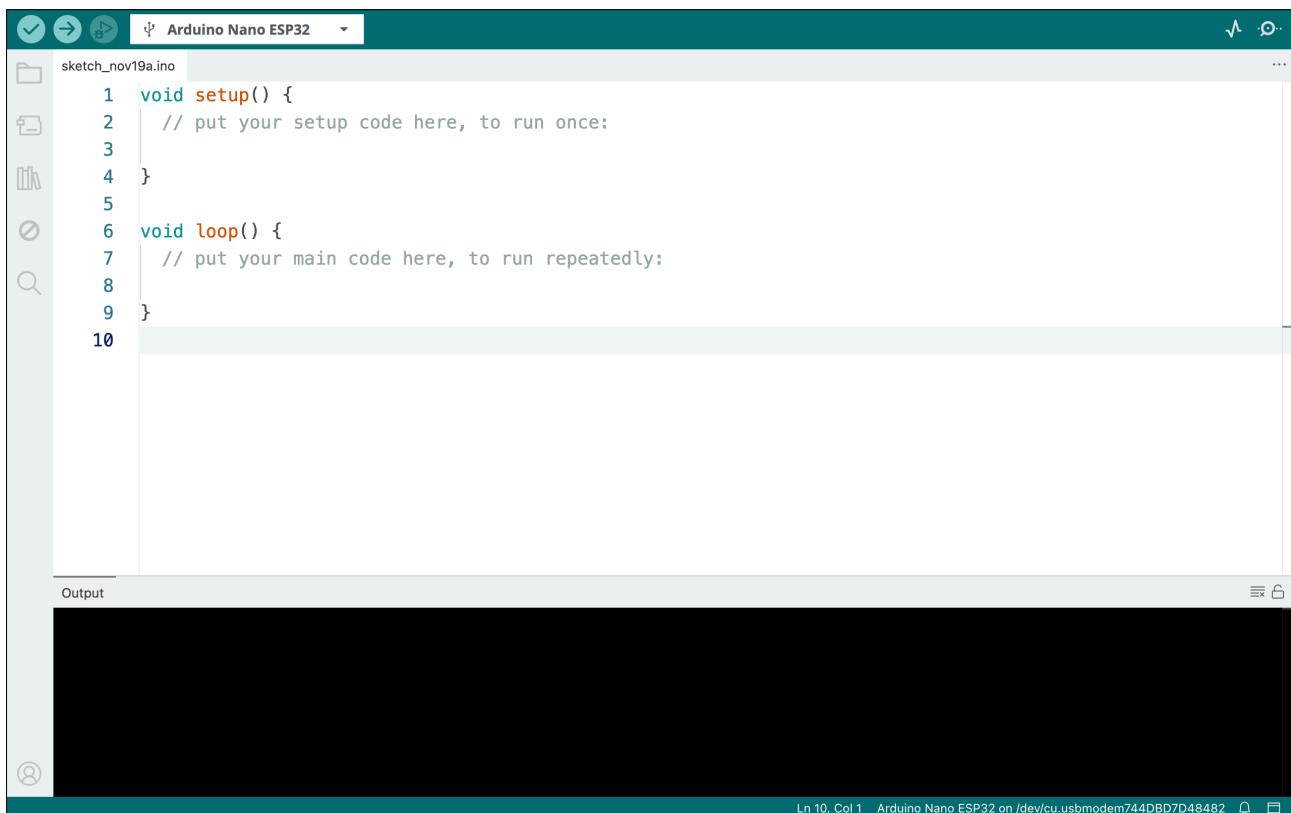


Getting Started

Once you have downloaded the software and opened it up, you should get a page like this. My preference is to delete all that and learn by typing it in again. Just like p5.js, all the code is called a sketch.

You will notice that instead of `function setup()` and `function draw()`, we have `void setup()` and `void loop()` instead. It is tantamount to the same thing.

Figure 5: default sketch



```
void setup() {
  // put your setup code here, to run once:
}

void loop() {
  // put your main code here, to run repeatedly:
}
```

 **Notes**

Just in case you are new here:

1. All the code that goes between the curly braces in the **void setup()** function happens just once.
2. All the code that goes between the curly braces in the **void loop()** function is a continuous loop.

```
void setup()
{
    .....
}
```

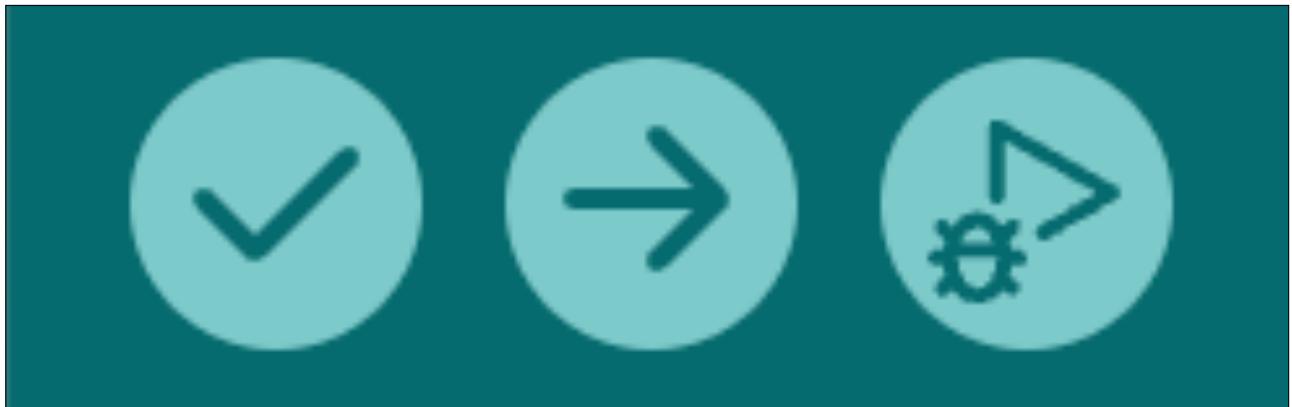
```
void loop()
{
    .....
}
```



The buttons

When you want to upload the code, you press the arrow button (middle).

Figure 6: the main buttons



You may get an error message because it will first compile to check the code is OK, you can manually compile (left button tick) before uploading. The error message you get may or may not be very helpful. You can copy it and then see if there are any answers on the internet. Usually, there is a small typo somewhere, and the error message will give a hint.

Note: You may need to press the restart/reset button (grey) on the Arduino after you have uploaded. This is evident if the built-in LED is **glowing**.



Installing the board software

Just to make sure we have the right board software installed for the **Arduino Nano 33 BLE**, we go to the list of icons on the left-hand side. Click on the second one down (outline of an Arduino Uno) and you should get the tab **BOARDS MANAGER**. Type **Arduino Nano 33 BLE** into the search box.

You will get three; the top one is the one you want. Click **INSTALL** and wait for it to be downloaded. You will notice that I have already downloaded it. It is important to keep up to date with all software. You usually get a reminder if there is an update.

Figure 7: downloading the board software

