

EMBEDDED SYSTEMS PROGRAMMING
PRACTICUM 1



By:

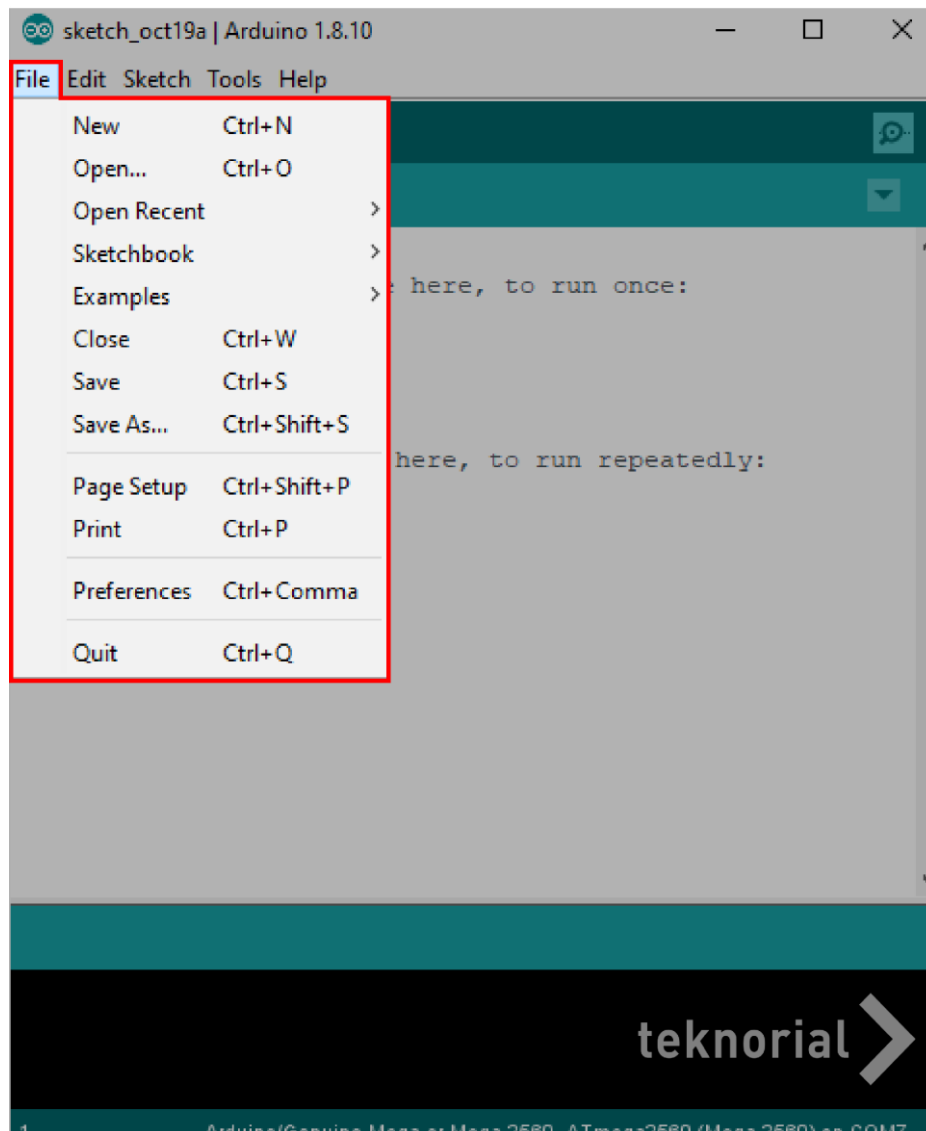
GANNO TRIBUANA KURNIAJI

NIM: L200184092

INFORMATION TECHNOLOGY
FACULTY OF COMMUNICATION AND INFORMATICS
UNIVERSITY OF MUHAMMADIYAH SURAKARTA
2021

1. Menu Arduino IDE

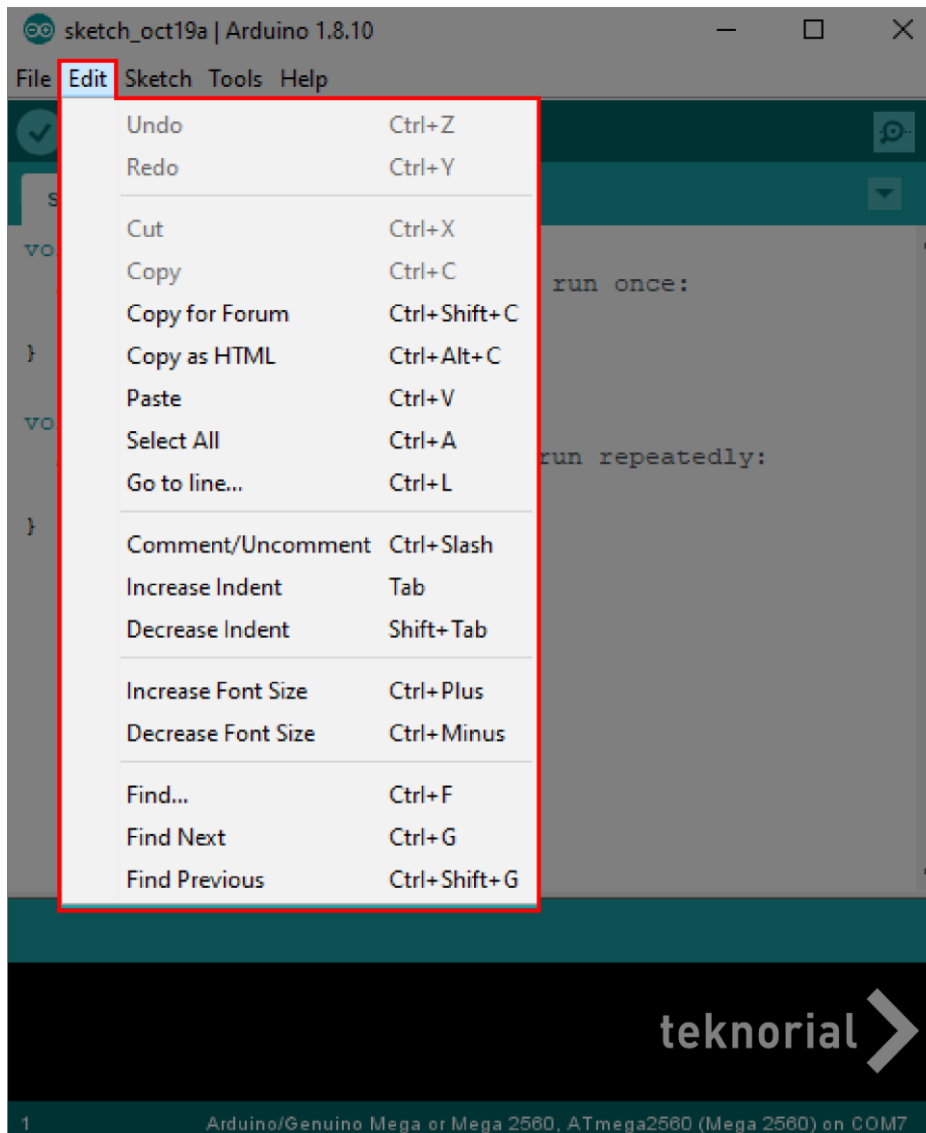
a. File



- 1) New, opens a new work (Sketch) sheet.
- 2) Open, serves to open Sketch that was created on storage media.
- 3) Open Recent, functions to shorten the time to open Sketch, the file that is open is the latest or last saved Sketch.
- 4) Sketchbook, serves to display Sketch that has been saved in the Arduino folder.
- 5) Example, contains various examples of program code provided by the developer.
- 6) Close, functions to close the Arduino IDE window while stopping the application.
- 7) Save, functions to save Sketch that has been created.
- 8) Save as, functions to save Sketch with a different name.
- 9) Page Setup, functions to set page views such as paper, orientation, margins for Sketch printing.
- 10) Print, functions to send the Sketch file to a printing machine to be printed or made into a pdf file.

- 11) Preferences, functions to change the appearance of the Arduino IDE interface.
- 12) Quit, functions to close all Arduino IDE windows. Sketch, which is still open when the Quit button is pressed, will automatically open when the Arduino IDE is run.

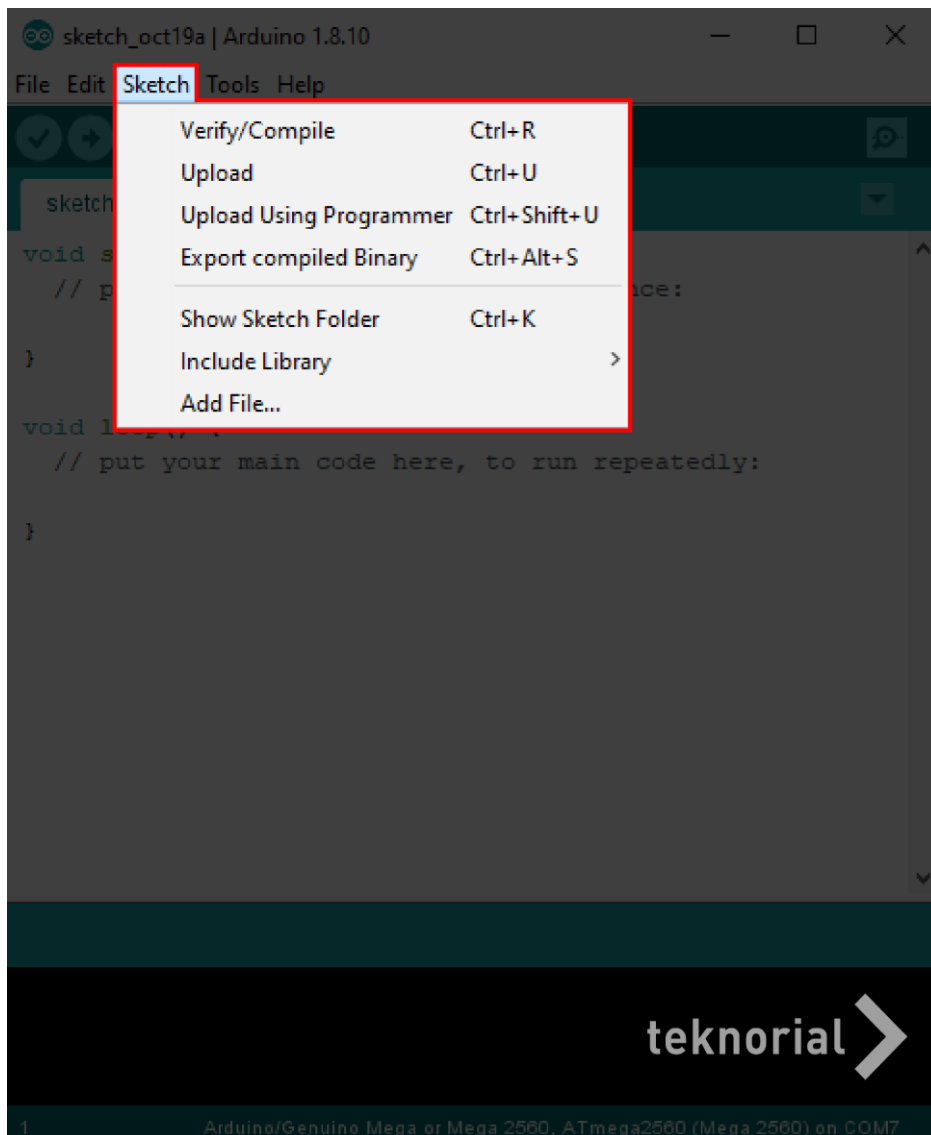
b. Edit



- 1) Undo, functions to go back one step of the change.
- 2) Redo, functions to advance one step of change.
- 3) Cut, functions to delete the program code in the editor that has been previously selected to be moved to another place, if desired, use paste.
- 4) Copy, functions to duplicate the program code in the previously selected sketch to be reproduced to another place, using paste if desired.
- 5) Copy for Forum, functions to copy the code from the editor and format it so that it is suitable for display in the forum.
- 6) Copy as HTML, functions to duplicate the selected text into the editor and place the text on the clipboard in HTML format.
- 7) Paste, functions to copy the data contained on the clipboard, into Sketch.
- 8) Select All, functions to select all text or code in the Sketch page.

- 9) Comment / Uncomment, functions to change the text or code that has been selected to have the status "comment" which is indicated by the // sign
- 10) Increase Indent, serves to add indentation on certain lines.
- 11) Decrease Indent, serves to reduce indentation on certain lines.
- 12) Find, functions to call the window window "find and replace", here you can search for text or code on the Sketch page, you can also replace the previous text or code with a new code.
- 13) Find Next, functions to find the word after the first word that was found.
- 14) Find Previous, functions to find the previous word from the first word that was found.

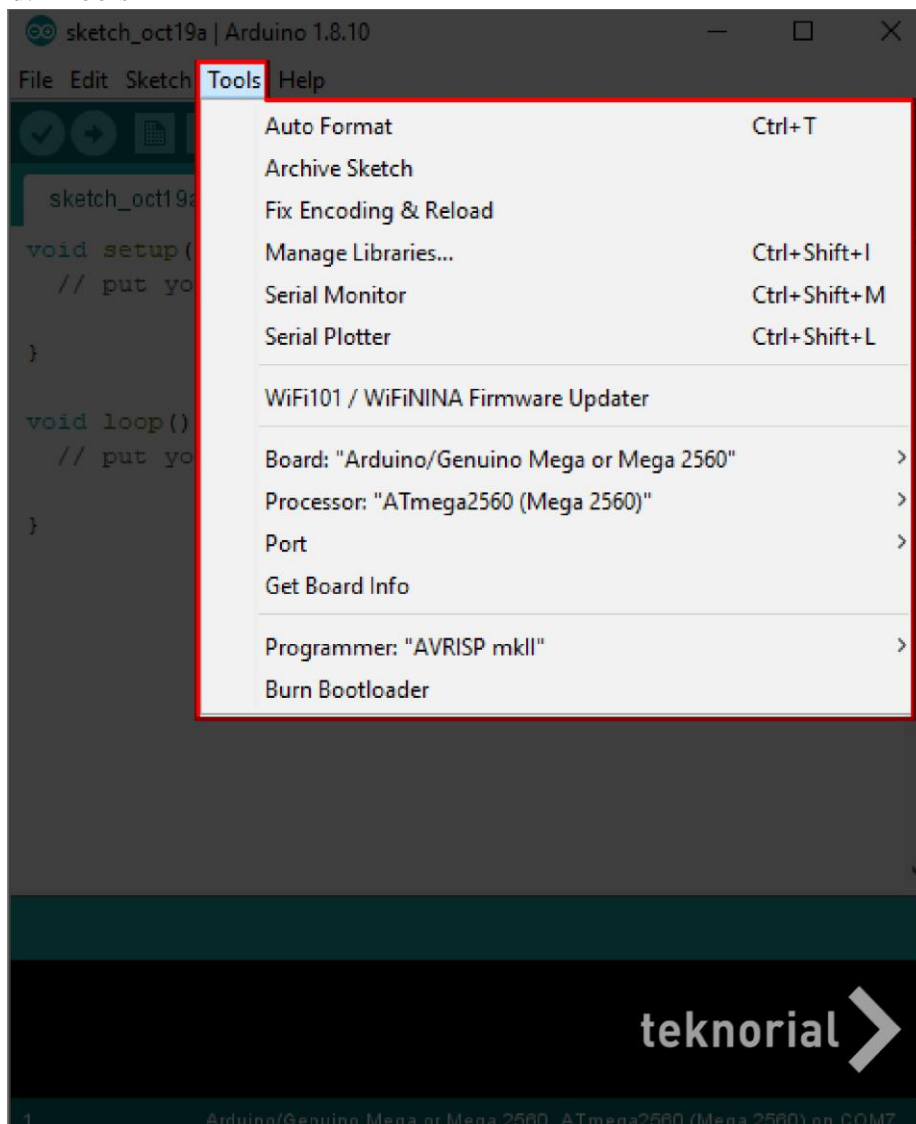
c. Sketch



- 1) Verify / Compile, functions to check the Sketch that you created whether there are errors in the language of the program (error). if not, your program will compile it.
- 2) Upload, the function of sending the compiled program to the Arduino Board.

- 3) Upload Using Programmer, serves to write the bootloader into the Arduino Microcontroller IC. In this case you need additional devices such as USBAsp to bridge writing the bootloader program to the Microcontroller IC.
- 4) Export Compiled Binary, functions to save files with the extension .hex, which later this file can be uploaded to another board with a different application.
- 5) Show Sketch Folder, functions to open the location of the Sketch folder that is currently being worked on.
- 6) Include Library, functions to add libraries / libraries that have been provided by the developer to the Sketch that is being worked on.
- 7) Add File, serves to add files to the Arduino Sketch, the file will appear as a new tab in the Sketch window.

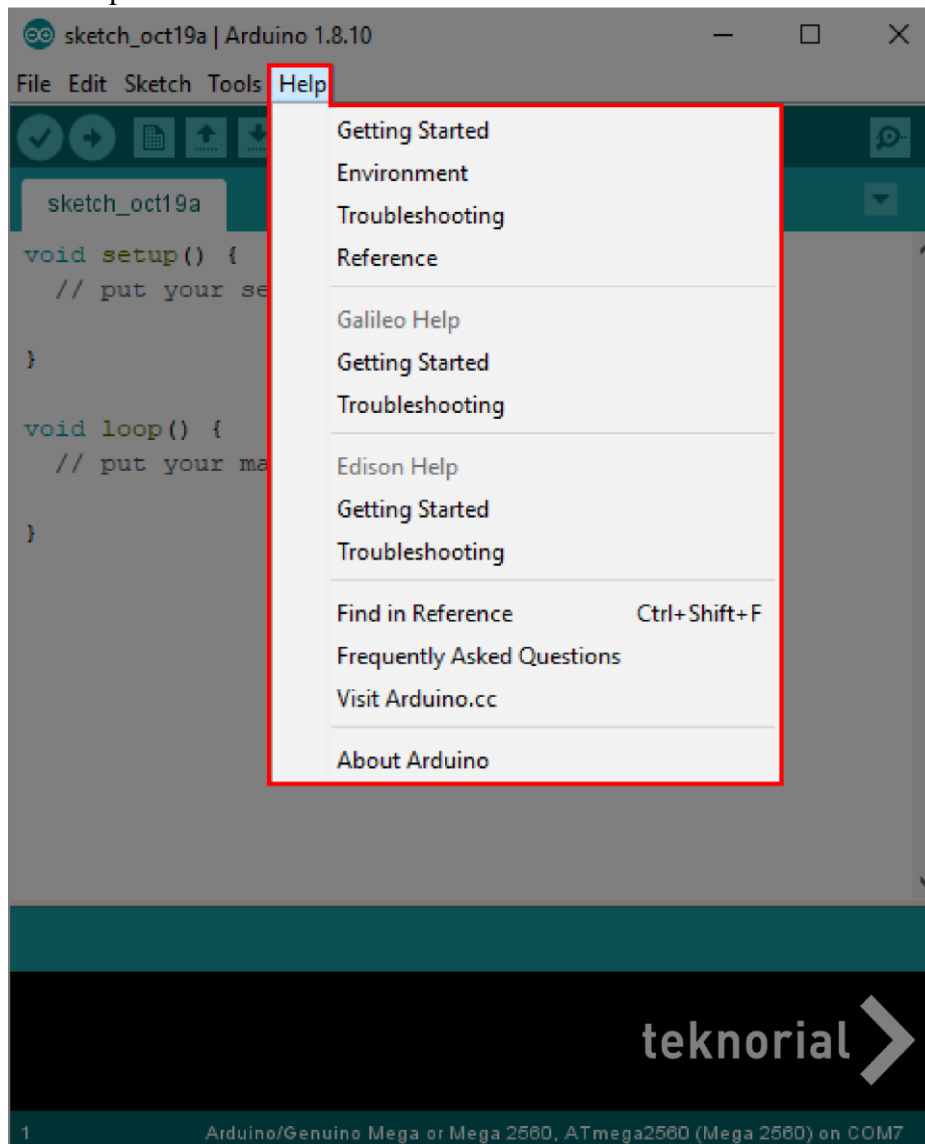
d. Tools



- 1) Auto Format, functions to adjust code formatting in the Sketch window.
- 2) Archive Sketch, functions to save Sketch into a .zip file
- 3) Fix Encoding & Reload, works to improve possible differences between Sketch character encodings and other operating system character maps.

- 4) Manage Libraries, Serves to install additional libraries from the Arduino team, or third party developers who have registered their libraries on Arduino.
- 5) Serial Monitor, opens the serial monitor window to see the data exchange serial communication interface from the program that has been created.
- 6) Serial plotter, serves to display a sine wave
- 7) Wifi101 / wfiNINA firmware updater, Serves to update wifi101 / wifiNINA
- 8) Board, functions to select and configure the board you want to use.
- 9) Port, functions to adjust the port as a communication line between software and hardware.
- 10) Programmer, this menu is used when you want to program the microcontroller chip without using the Onboard USB-Serial connection. Usually used in the bootloader burning process.
- 11) Burn Bootloader, allows you to copy the bootloader program into the microcontroller IC.

e. Help

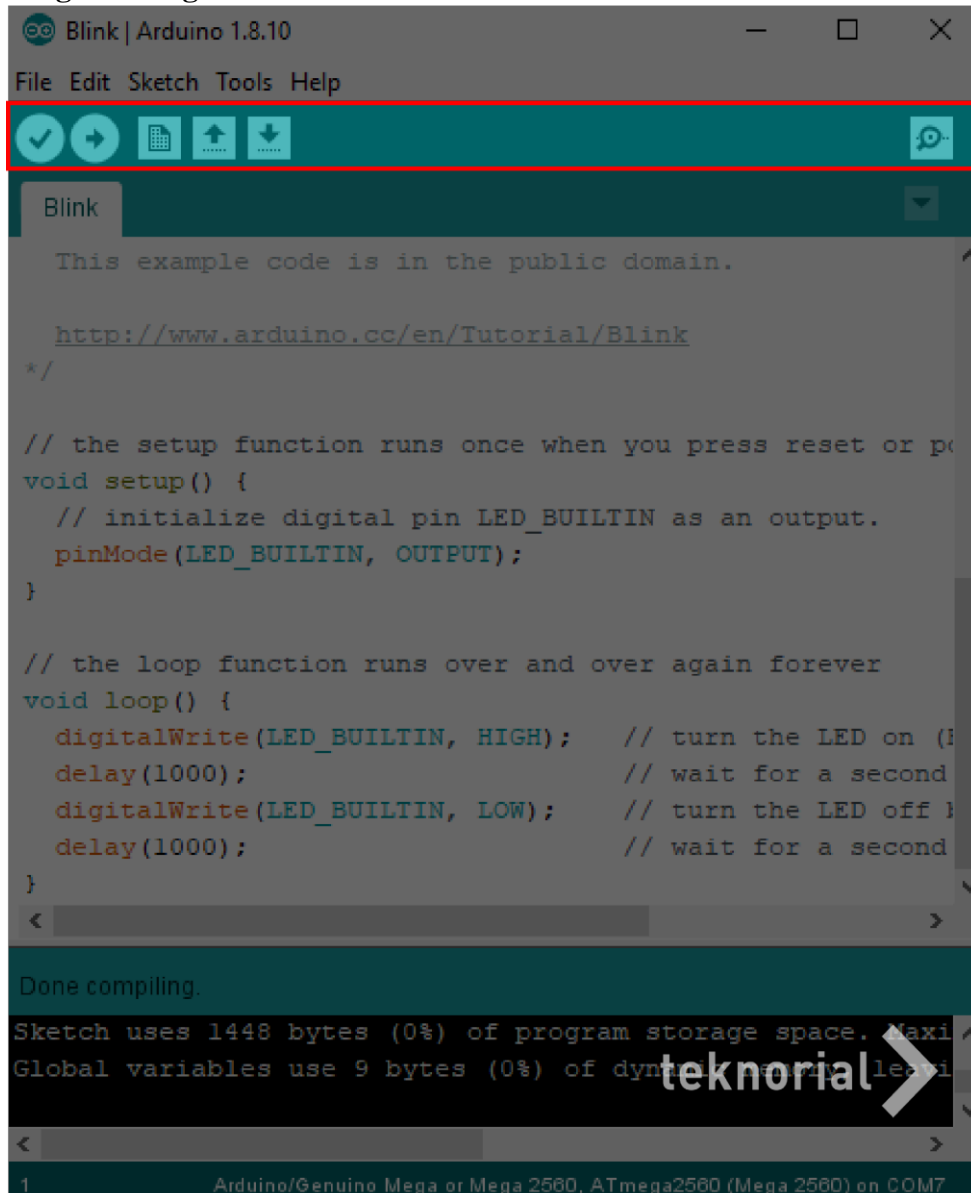


- 1) Getting starter, after choosing getting starter you will be transferred to the Learning page, here you will be taught how to start installing Arduino and also

how to test it is ready to use or not, more or less the same as the tutorial I made before Installing Arduino .

- 2) Environment, here you will be explained about the menus and shortcuts in the Arduino IDE.
- 3) Troubleshooting, here you will explain how to solve problems that often arise when using the Arduino IDE.
- 4) Reference, here you will explain about the Sketch language that you use when you start writing in a text editor such as structure, variables, functions.
- 5) Find in Reference, here you will explain how to make good comments and tips for using it to make it easier to write programs in a text editor.
- 6) Frequently asked questions, on this page the developer will help you to answer some questions that often arise because of your ignorance.
- 7) Visit Arduino.cc, here you will be directed to the Arduino.cc website page, for more details, there is anything on the official website, please explore it yourself.
- 8) About Arduino, here you will see the Arduino version you are using, it looks the same as getting starter when you open the Arduino software (IDE)

2. Programming Shortcuts



- Verify: functions to check the program that we have created is in accordance with the rules for writing C++ for Arduino or not. get used to verify the program that has been made before uploading.
- Upload: functions to send the program that we have created from the Arduino IDE software to the Arduino memory board.
- New Sketch: functions to Open a new worksheet or Sketch.
- Open: functions to open a worksheet or sketch that has been made to make edits or to re-upload.
- Save: serves to save the Sketch that has been made into our storage media.
- Serial monitor: functions to view serial communication interface data from the program that we have created, which is sent or exchanged between Arduino and Sketch on the serial port. This serial monitor can be used to display process values, read values, and even error messages in the program we have created.