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**RASPBERRY PI**

The Raspberry Pi is a low cost, credit-card sized computer that plugs into a computer monitor or TV, and uses a standard keyboard and mouse.

The Raspberry Pi is designed for educational purpose to improve programming skills and hardware programming.

The Raspberry Pi is slower than the laptop or desktop and it is totally in the Linux operating system.

They are categorized by combination of model name and generation. The model names include A, A+, B, B+, Zero and Compute Module.

Each model is differentiated by available connectors and size of the main board. Each generation is mainly differentiated by the chip performance.

The latest model of Raspberry Pi is Raspberry Pi 3+ Model B+.

Raspberry Pi 3+ Model B+ Hardware:

* 1.4 GHz 64 –bit quad-core ARM Cortex-A53, 1GB RAM
* 40 General purpose input and output pins
* 4 USB ports and Combined 3.5mm audio jack
* Micro SD card slot and Camera interface
* Bluetooth 4.2/BLE
* Integrated Wi-Fi
* Power over Ethernet

Raspberry Pi 3+ Model B+ vs Arduino :

* Raspberry Pi processor is faster than Arduino processor.
* But OS and other things in Raspberry Pi slows things down. Because OS has a big block of code that has to be executed.
* Raspberry Pi is voltage sensitive.
* Arduino are not sensitive to anything.
* The operating system in Raspberry Pi provides library functions for drives that are connected to Raspberry Pi. Arduino can’t do that.

Operating System benefits :

* Operating System provides user interface.
* It allows user to give commands to the computer and do basic things, without writing any code.
* It allows user to interact with machines without writing any code.
* Linux OS provides two types of user interfaces. They are Text based interface and Graphic interface.
* Text based interface: It allows user to type the commands in the prompt and when enter is pressed, it executes the whatever the commands says right.
* Graphic user interface: GUIs provides users with immediate, visual feedback about the effect of each action. GUI allows multiple programs and/or instances to be displayed.
* It allows user to type commands directly into text based interface and use point click interface in graphics.
* OS allows user to run multiple programs at same time.

Raspberry Pi has network connectivity, computational intelligence and can interface directly with sensors/actuators via pins which makes it as an Internet of Things ( IoT ) device.

Overclocking:

* Overclocking refers to increase the clock frequency of the device, beyond the recommended frequency.
* Overclocking may also refer to increasing in the internal voltage levels to increase speeds.
* It speeds up the execution.
* It causes to increase temperature in the devices.

Linux is the operating system that is running in Raspberry Pi.

Shell:

* Interprets user input and executes commands.
* Text-based user interface of an operating system.
* Bash is the default shell for Raspian.
* More precise control to the user.

The console or terminal is a text entry and display device.

LXTerminal is the terminal used in Raspian.

Default username: “pi”, password:” raspberry”.

Linux Commands:

Man(ual) Pages: It gives information about Linux commands.

Syntax: man <command>

Pwd: Reports in which directory is currentlu accessing.

Cd (Change directory): Used to change Directory from one directory to another.

Cd /<directory\_name> - change to <directory\_name> directory.

Cd – change to default directory.

Cd.. –moves up one level.

Cd <directory\_name> - it looks into the local directory and hen change directory to directory\_name.

Ls : It lists the contents of the directory

Ls-l : It lists the contents of the directory in long form.

Mkdir : Creates a directory

Mkdir <directory\_name>

Rmdir :Removes a directory

Rmdir <directory\_name>

Rmkdir works only if directory is empty.

“ sudo apt-get install nano ” to install nano

“ nano “ to run

Nano <text\_file> it shows contents in text file.

Cat: Used to display contents of file in terminal

Cat <file\_name>

Head: prints first 10 lines in file.

Tail or last: prints last 10 lines in file.

Head-<n> : to list n number of lines.

Cp : copy a file.

Mv: move a file

Rename file or move file to a new directory.

File permissions:

* User: the file owner.
* Group: a permission group.
* Other: all users.

Acess permissions:

* Read(r).
* Write(w).
* Execute(x).

Root Account:

* The root account has high permission level.
* Key files and directories are only accessible by root.
* “sudo” command is used to gain root permission for a single command.

Ps : used to view process.

Kill : used to kill a process.

Shutdown : It do all it’s shutdown suff.