TASK 1

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# RaspBERRYPI AND ITS SPECS

* Raspberry Pi is a small computer which has an operating system in it
* Quad core Broadcom BCM2837 SoC (ARM processor).
* It has 40 GPIO pins , 4 USB ports , Micro SD card slot , Bluetooth 4.2 , Integrated WIFI .

## RaSPBERRY pi v/s arduino

|  |  |
| --- | --- |
| Raspberry Pi processor is faster  1.4 GHZ   * Running an OS | Arduino is Slow  16MHZ |
| 64 bit Processor | 8 bit Processor |
| More Memory   * 1 GB SRAM and Unlimited flash memory | Less Memory   * 2KB SRAM and 32KB flash   memory |
| Lower IO voltages  3.3 V | Higher Voltage  5V |
| Sensitive to Power | Control Operations and not sensitive to Power |
| Has an Operating System   * Application * Library Functions * System calls * Microcontroller | Only for Simple Tasks   * Application to Microcontroller |

# Getting Started with raspberrypi

* Raspberry pi as an IoT device!

Raspberry Pi can be used as an IoT device when we are interacting with the sensors and acurators.

* Setup of the Raspberry pi
  + Plugging in the Monitor and Keyboard
  + Getting an Operating system
  + Installing an OS using NOOBS
  + Raspi-Config
  + Exploring options like Expand File system , Enable boot to desktop .
  + Internationalization and Rastrack.
  + Overclocking:

Overclocking can increase the clock speed of the raspberrypi , which results in fast results but there can be high increase in temperature of the device.

# OPerating System : LINUX

**LINUX Basics:**

**The Shell:**

* + - Interprets user input and execute commands.
    - Text based user interface of an OS.
    - Bash is the default shell for Raspian.
    - Gives more precise control to the user
    - Requires memorization for efficiency.

**Console or Terminal:**

* + - It is a Text entry and display device.
    - Lx Terminal is used in the Raspian.

User name and Password:

Default:

Username: ‘pi’

Password: ‘raspberry’

**Shell’s Path:**

PATH is an environmental variable. It includes the most common program locations , such as /bin , /usr/bin/ , etc…

**Command Syntax:**

Linux is case sensitive.

Command [-argument] [-argument] [file]

Ex: ls #List the files in current directory

ls-l #list files in long format

**Getting help:**

When we are stuck and need help we can use the ‘man’ command to display a command’s manual.

Type ‘man <command name>’

Ex: man ls #Get help on the ls command

man man #A manual about how to use manual

**Commands for Navigating the File System:**

1. pwd (“Print Workind Directory”) #Shows the current location in the directory tree
2. cd (“Change Directory”) #It returns to your hone directory.
3. cd <dir\_name> #changes current path to specified directory name
4. cd ~ : ‘~’ is an alias for home directory
5. cd.. : Move up one directory
6. cd- :Returns to previous directory
7. ls #List all the files in current directory
8. ls <dir\_name> #List all the files in specified directory
9. ls -l : List files in long format
10. ls -a : List all files including hidden files.
11. ls -ld : A long list of directory
12. ls /usr/bin/d\* : Lis all the files starting with letter ‘d’

**Files and Directories:**

Commands that can be used to find information about files and manipulate them.

1. touch: Creates a new empty file
2. file : To find what kind of a file it is.
3. cat : Display the content of the file
4. head : Display the first few lines
5. tail : Display the last few lines
6. cp : copies the file from one location to another.
7. mv : Moves a file to a new location or renames it.
8. rm : Delete a file
9. mkdir : Make directory
10. rmdir : Remove directory. (Only when the file is Empty)

**File Permissions:**

* Files have owners.
* They have access permissions . Read(r) , Write(w) , Execute(x).
* Different permission can be assigned according to type.

User: The file Owner

Group: A Permission group

Other : All users

**Root Account:**

* + - The Root account have highest permission level
    - Key files and directories are only accessible by root.
    - Sometimes you need root privileges to Install a program and change the operating system.
    - Use the ‘sudo’ command to gain root permission for a single command

**Processes:**

Process is execution of a program.

Linux allows multiple processes to run concurrently

Foreground vs Background Processes.

User can only see the Foreground processes , where as the background processes like reading an email , downloading a file , waiting for network connection and checking for viruses is taken care by the OS.

* ‘ps’ command is used to display the current running commands along with process ID.
* ‘kill’ is used to terminate a process.

We may have to choose a text editor inorder to write the commands.

Ex: Emacs , vi , vim , Nano.

Nano is a common text editor.