4.1.2 Raspberry Pi

Raspberry Pi is a low-cost pocket computer that is very economical to own. It is about the size of an ATM Card and can work as a fully functional computer in certain normal use cases, like working with simple applications, playing low-end games, etc. It was first released in 2012 by the Raspberry Pi foundation with the aim to provide easy access to computing education to everyone. It can cost as less as 5$ to a maximum price of 100$ (which is rare).

Scope

we will be understanding Operating systems that can be installed on a Raspberry Pi.

- We'll learn about What an operating system in general is.
- We'll go through a Variety of Operating Systems that a Raspberry Pi can run.

Introduction

As read above, Raspberry Pi is a very low-cost computer that comes along with the advantage of portability. However, being in such a small form factor, it gets bounded by the type of hardwareto use in making it; hence, it will be significantly tough to run regular operating systems on it.

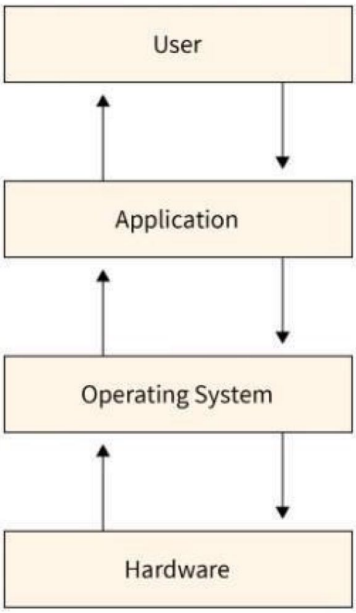
Due to this, specific operating systems were designed to power a Raspberry Pi; some of them were entirely new, while some originated from existing popular operating systems. Most of the Raspberry Pi OS is Linux based, but it also has windows 10-based Raspberry Pi OS (Windows 10 IoT core) built explicitly for low-powered devices like this.

What is an Operating System?

The technical definition is **An operating system is an interface between the hardware of a machine and the user who is using it**, but what does this really mean? It means it is basically the medium using which we communicate with our computer machine. It does not matter if we have the fastest system in the world; at the end of the day, that is just hardware, an object; andwe do not know how to work with it, so we need some medium that works as an intermediate between us and the computer, i.e., when we press ctrl on our keyboard, it should instruct the computer what to react based on that; when we want to open some application, it should provide us a way to do so, by listing all the available applications on the system.

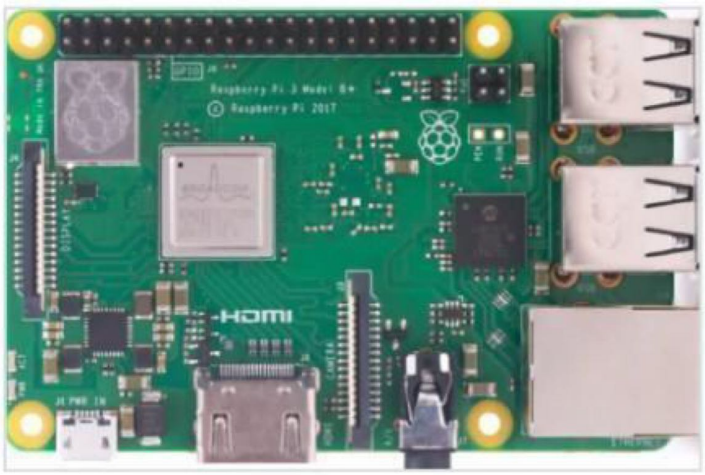
Meaning an operating system is a software program that helps us to use and to connect with the computer hardware. For example, if we want to use our mouse or keyboard, only with the help ofan OS we can do that; if we want to install some program on our computer, we would be needingan OS; if we want to create a file, we need an OS; we want to delete a file, we would again be

needing an OS, i.e., without an operating system we cannot use the computer hardware, wewould be needing some underlying software, i.e., some operating system, using which we would do so.



What is a Raspberry Pi Operating System

Now, what is Raspberry Pi operating system? Before that, let's first try to understand what Raspberry Pi is. Raspberry Pi is a small, low-cost computer, and its size is about the size of an ATM card, which is developed by the Raspberry Pi foundation. The organization's mission is to educate people in computing and to provide easier access to computer education.



The above image is a picture of a Raspberry Pi; we can see that there are various ports available in it on which different devices can be mounted and used.

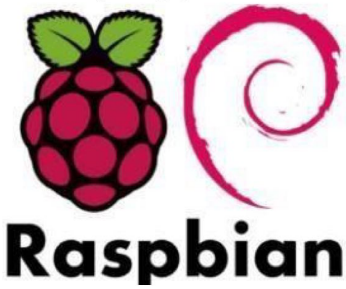
It was first launched in 2012, and from then onwards, various variations of it have been launched. The original Raspberry Pi had a single-core 700mhz CPU and a 256MB of RAM, butit has evolved a lot since then; today, we have a quad-core Raspberry Pi with a clock speed of around 1.5Ghz and up to 4GB of RAM. Surprisingly the cost of Raspberry Pi has always been less than 100 USD. In fact, the Raspberry Pi Zero (an even low-cost version of regular RaspberryPi) costs as less as 5 USD. A full-fledged general-purpose CPU under 5$, that's what theorganization's mission is "Aiming to provide people easier and low-cost access to the computers."

Raspberry Pi is used by people all around the world in learning how to program, build hardware projects, do home automation, and implement Kubernetes clusters, and it is even getting used in some industrial applications. Raspberry Pi is a very economical computer that runs LinuxOperating System.

Now, let's talk about which specific distribution of Linux Raspberry Pi uses. Raspberry Pi officially recommends the use of the Raspbian Operating System. It is a Debian-based OS, explicitly made for Raspberry Pi and hence its name **Raspbian.**

Raspbian

Raspbian or Raspberry Pi OS is a Linux-based operating system built specifically for Raspberry Pi. It is packed with all the necessary tools and features that are required for day-to-day use. It will possibly run on every kind of Raspberry Pi board with a few exceptions, like the Raspberry Pi's pico edition, because of its far smaller form factor and computing power.



NOOBS

New Out Of the Box Software, or simply NOOBS is an operating system installer for Raspberry Pi, delivered primarily on an SD card, which contains a variety of operating systems, out of which we can choose which one we want to install on our Raspberry Pi. It is made for people who are absolutely new to the Raspberry Pi and do not want to deal with the complex setting up process of burning an OS image on an SD card. NOOBS is provided along with every new Raspberry Pi at the time of its purchase.

With NOOBS, the user only needs to connect their Raspberry Pi to a display screen and a keyboard and then power it up; the NOOBs will boot. There we can select which operating system we want to install, and NOOBS will install the respective OS on the same SD card withina few minutes.