RASPBERRY PI

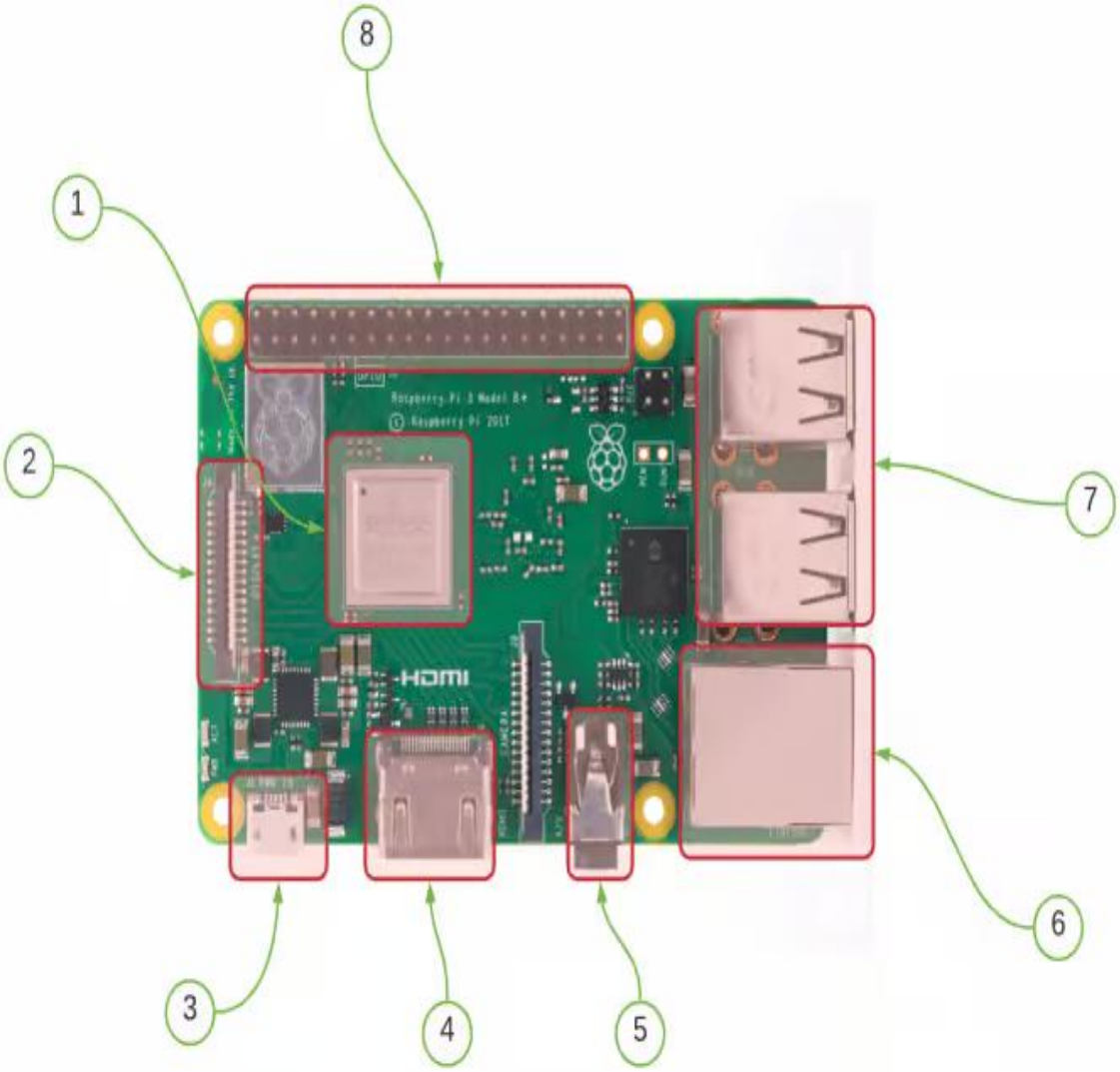
Introduction

- Raspberry Pi is a series of small single-board computers developed by the Raspberry Pi Foundation in collaboration with Broadcom.
- It is affordable, compact, and versatile, making it popular for education, DIY projects, and professional applications.
- Initially created for teaching basic computer science, it has gained widespread use in projects like gaming devices, fitness gadgets, weather stations, and more.
- Manufactured mainly in the Sony factory, Pencoed, Wales.

Generations and Models

- First launched in 2012, Raspberry Pi has multiple generations: Zero, 1, 2, 3, and 4.
- **Model types:**
  - **Model A & A+** → Compact, fewer ports, and lower cost.
  - **Model B & B+** → Full-sized, more ports, and better connectivity.
  - **Raspberry Pi Zero** → The smallest and most affordable version.

Raspberry Pi Versions & Specifications



1. Broadcom CPU
2. DSI Display Interface
3. micro-USB power in
4. HDMI Port
5. Audio/Video output
6. Ethernet Port
7. USB Ports
8. 40-pin header

Version	Release Year	Size (mm)	CPU Speed	Cores	RAM	USB Ports	Power	HDMI	Wi-Fi	Bluetooth	Ethernet	External Storage
Raspberry Pi 4 Model B	2019-2020	85.6 x 56.5	1.5 GHz	Quad	1, 2, 4, 8 GB	2 USB 3.0 + 2 USB 2.0	5.1V 3A (USB-C)	2 × micro-HDMI (4K)	Dual Band (2.4 & 5GHz)	Bluetooth 5.0	Gigabit Ethernet	MicroSD
Raspberry Pi 3 Model B+	2018	85.6 x 56.5	1.4 GHz	Quad	1 GB	4 USB 2.0	5.1V 2.5A	HDMI, Composite (TRRS)	Dual Band (2.4 & 5GHz)	Bluetooth 4.2	10/100 Mbps	MicroSD
Raspberry Pi 3 Model B	2016	85.6 x 56.5	1.2 G	Quad	1 GB	4 USB 2.0	5.1V 2.5A	HDMI, Composite	2.4 GHz	Bluetooth 4.1	10/100 Mbps	MicroSD

			Hz					(TRRS)				
Raspberry Pi 3 Model A+	2018	65 x 56.5	1.4 GHz	Quad	512 MB	1 USB 2.0	5.1V 3A	HDMI, Composite (TRRS)	Dual Band (2.4 & 5GHz)	Bluetooth 4.2	No Ethernet	MicroSD
Raspberry Pi Zero Wireless	2016	65 x 30 x 5	1 GHz	Single	512 MB	1 MicroUSB	5.1V 1.2A	Mini-HDMI, GPIO Composite	2.4 GHz	Bluetooth 4.1	No Ethernet	MicroSD
Raspberry Pi Zero	2015	65 x 30 x 5	1 GHz	Single	512 MB	1 MicroUSB	5.1V 1.2A	Mini-HDMI, GPIO Composite	No Wi-Fi	No Bluetooth	No Ethernet	MicroSD
Raspberry Pi 2 Model B	2015	85.6 x 56.5	1.2 GHz	Quad	1 GB	4 USB 2.0	5.1V 1.8A	HDMI, Composite (TRRS)	No Wi-Fi	No Bluetooth	10/100 Mbps	MicroSD

Raspberry Pi 1 Model B+	2014	85.6 x 56.5	700 MHz	Single	512 MB	4 USB 2.0	5.1V 1.2A	HDMI, Composite (TRRS)	No Wi-Fi	No Bluetooth	10/100 Mbps	MicroSD
Raspberry Pi 1 Model B	2012	85.6 x 56.5	700 MHz	Single	512 MB	2 USB 2.0	5.1V 3A	PAL, NTSC, HDMI, RCA	No Wi-Fi	No Bluetooth	10/100 Mbps	MicroSD
Raspberry Pi 1 Model A+	2014	65 x 56.5	700 MHz	Single	512 MB	1 USB 2.0	5.1V 700mA	HDMI, Composite (TRRS)	No Wi-Fi	No Bluetooth	No Ethernet	MicroSD
Raspberry Pi 1 Model A	2013	85.6 x 56.5	700 MHz	Single	256 MB	1 USB 2.0	5.1V 700mA	PAL, NTSC, HDMI, RCA	No Wi-Fi	No Bluetooth	No Ethernet	MicroSD

Key Features

Low Cost – Affordable for students, hobbyists, and professionals.

Compact & Portable – Small size, ideal for embedded systems and DIY projects.

Expandable – Supports cameras, sensors, and external devices via GPIO pins.

Multiple Uses – Programming, IoT, robotics, media centers, home automation, etc.

Energy Efficient – Low power consumption compared to traditional PCs.

History & Development

- Founded in 2006 by Eben Upton, Pete Lomas, and David Braden.

- **Goal:** To create an affordable computer for learning and experimentation.

- **Milestones:**
  - **2012:** First Raspberry Pi (Model B) launched.
  - **2013:** Model A introduced (cheaper, less power).
  - **2014-2015:** Compact Model A+ and Raspberry Pi Zero released.
  - **2019-2020:** Powerful Raspberry Pi 4 with 8GB RAM and dual HDMI introduced.

- **Why the name?**
  - "Raspberry" follows the tradition of naming computers after fruits.
  - "Pi" refers to Python Programming Language.

Applications

Education – Learn Python, Scratch, and coding fundamentals.

DIY Projects – Robotics, home automation, weather stations, etc.

Media Centers – Streaming (Kodi, Plex), retro gaming (RetroPie).

IoT & AI – Smart devices, automation, and machine learning.

Industrial Use – Embedded systems, monitoring, and control.