# Development Boards used for IoT

# Arduino Uno

Arduino Uno remains to be the top favorite of absolute beginners and experts. Considered to be one of the first microcontroller-based development boards, the Arduino Uno R3 is simplest yet the most powerful prototyping environment. It is based on the ATmega328P which has 14 digital input/output pins and six analog inputs. Though it comes with just 32 KB of Flash memory, it can accommodate code that deals with complex logic and operations

| | |
|---|---|
| **Developer** | **arduino.cc** |
| **Manufacturer** | **Arduino** |
| **Type** | **Single-board microcontroller** |
| **Operating system** | **None** |
| **CPU** | **Atmel AVR (8-bit),**<br>**ARM Cortex-M0+ (32-bit),**<br>**ARM Cortex-M3 (32-bit),**<br>**Intel Quark (x86) (32-bit)** |
| **Memory** | **SRAM** |
| **Storage** | **Flash, EEPROM** |
| **Website** | **www.arduino.cc** |

# Raspberry Pi

In 2006,a group based in the University of Cambridge's Computer Laboratory, decided to address the need for a low cost computing platform that would allow kids to learn how to program without the need for a full-fledged home computer.

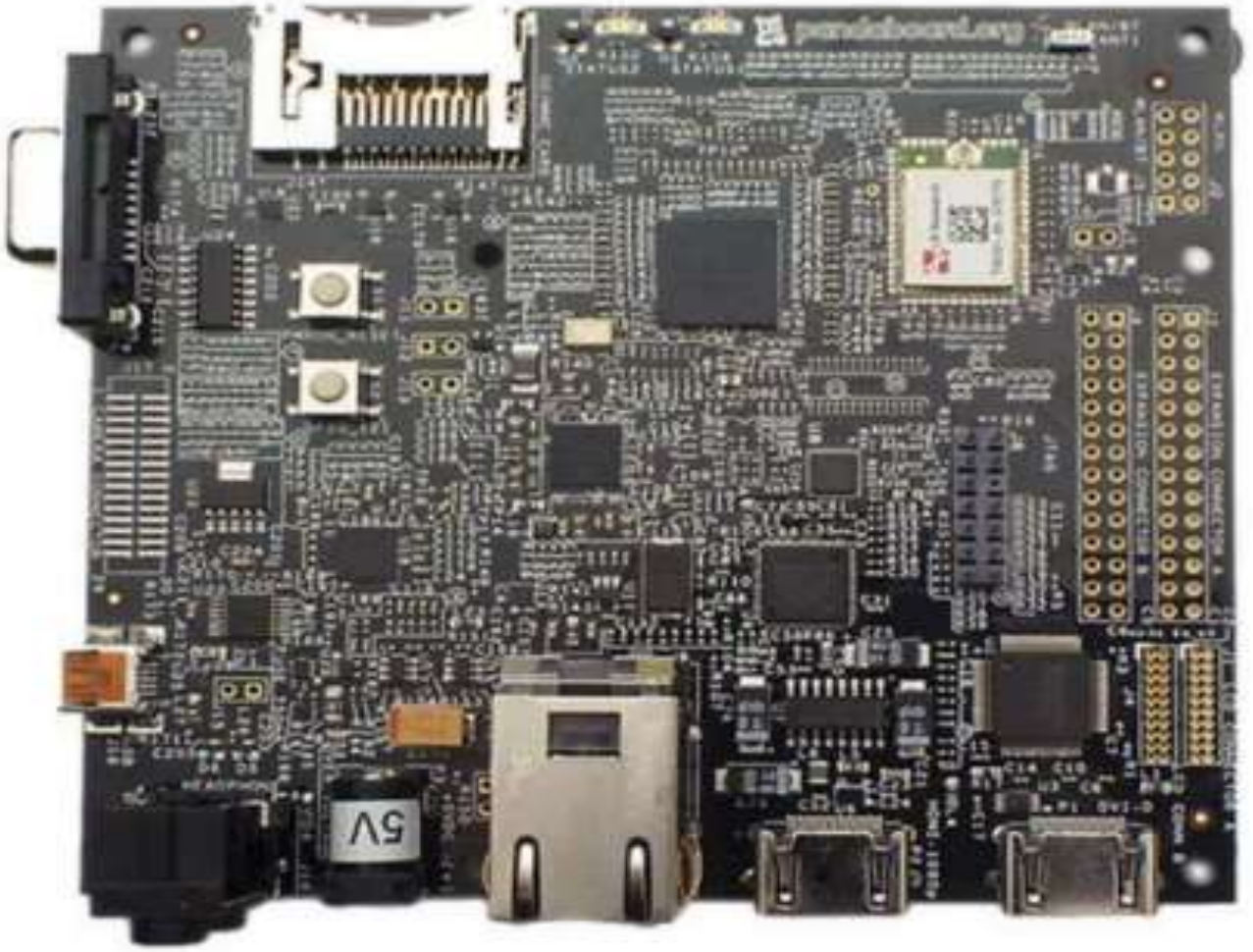
The result was a $35 single board computer named RaspberryPi.

Now, Rpi was adopted by makers, designers, students and even professional engineers and helped to launch the current boom in SBCs.

- A 900 MHz quad-core ARM Cortex-A7 CPU
- 1 GB RAM
- 4 USB ports
- 40 GPIO pins
- Full HDMI port
- Ethernet port
- Combined 3.5 mm audio jack and composite video
- Camera interface (CSI)
- Display interface (DSI)
- microSD card slot
- VideoCore IV 3D graphics core

# PandaBoard

It is an open OMAP 4 processor-based mobile software development platform. The OMAP (Open Multimedia Applications Platform) processor was developed by Texas Instruments for portable/mobile multimedia applications. In 2012 TI announced that it was quitting the mobile processor business to concentrate on embedded platforms, and the future of OMAP remains uncertain. The PandaBoard can be obtained from DigiKey.



# CubieBoard

runs a 1 GHz processer, has an extra infrared sensor, which is good for using as a media center, and also comes with a SATA port.

# BeagleBone Black

The BeagleBone Black contains a TI Sitara **AM335x ARM Cortex A8 processor** running at 1 GHz clock speed.
It has 512 MB DDR3 RAM
**2 GB 8bit eMMC** on-board flash storage which is used to boot an OS.
By default, it comes with the Linux Angstrom pre-loaded OS and can support different flavors of Linux and Android.
it comes with **one USB port, one microUSB port, a micro HDMI port, a micro SD card slot and a 10/100 Ethernet jack**.
BeagleBone Black has **65 digital I/O pins, analog pins, SPI, I2C, PWM, timers, and much more!**

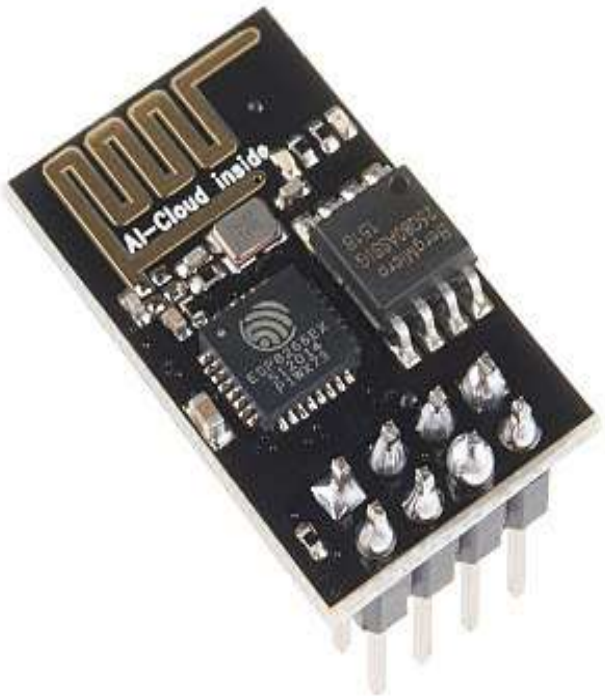
# ESP8266

ESP826 is an inexpensive Wi-Fi microchip that is featured with TCP/IP stack and micro-controller using UART. It has 1 MiB of built-in flash that allows the single-chip devices capable of connecting to Wi-Fi. Each module is pre-programmed with AT commands that makes it a plug-n-play model for developing IoT projects. ESP8266 also provides WEP(wired equivalent privacy) or WPA/WPA2 authentication for secure network connection. Themodule also has 16 GPIO(**General-purpose input/output** (**GPIO**) pins that can be used for defining specific purposes.

| | |
|---|---|
| Manufacturer | Espressif Systems |
| Type | 32-bit microcontrollerCPU@ 80 MHz (default) or 160 MHz |
| Memory | 32 KB instruction, 80 KB user data |
| Input | 16 GPIO pins |
| Power | 3.3 V DC |
| Successor | ESP32 |

IEEE 802.11 b/g/n Wi-Fi Integrated

WEP or WPA/WPA2 authentication, or open networks



# Node MCU

**NodeMCU** is a low-cost open source IoT platform

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|---|---|
| Developer | ESP8266 Opensource Community |
| Type | Single-board microcontroller |
| Introductory price | $5 |
| Operating system | XTOS |
| CPU | ESP8266 (LX106) |
| Memory | 128kBytes |
| Storage | 4MBytes |
| Power | USB |
| Website | www.nodemcu.com |