

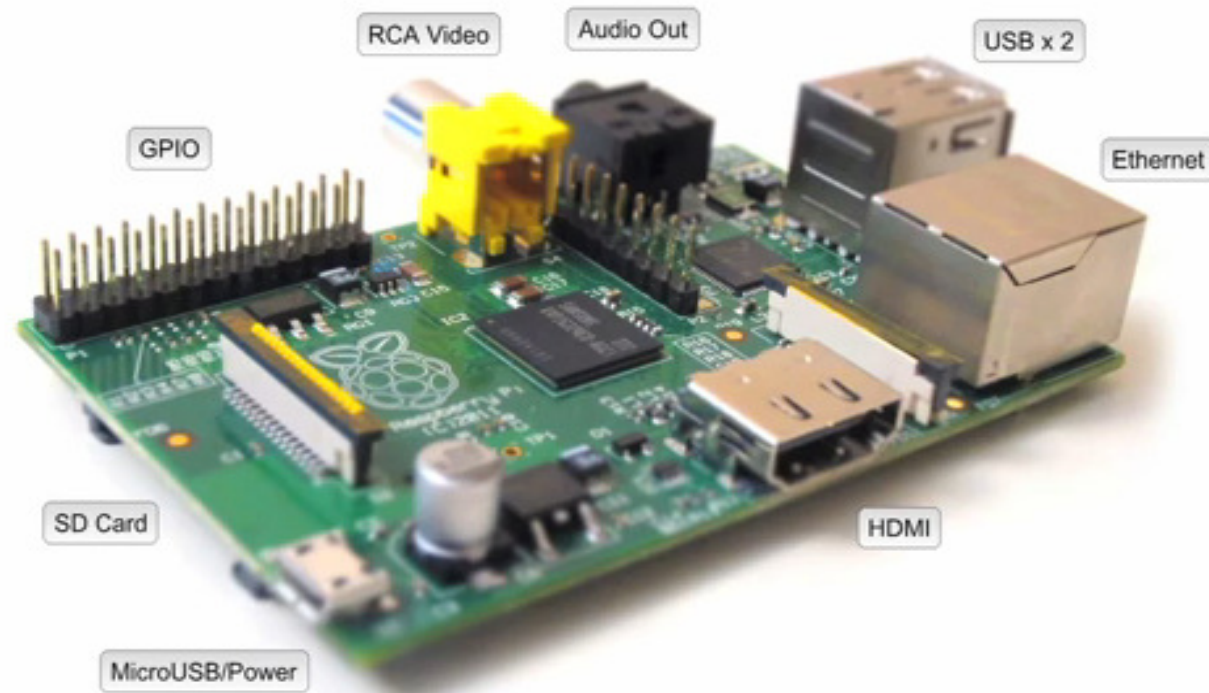
A Slice of Raspberry Pi



By: Paul F. Beeman, W2PB
"A user not a programmer"



Raspberry Pi



Originally developed for classroom education for teaching programming in the U.K. without the need for purchasing more expensive laptop computers.

Raspberry Pi- B Version



- ❧ 512 MB of ram
- ❧ SD card for program memory (I use a 32GB card)
- ❧ Composite video output,
- ❧ Analog stereo audio out
- ❧ HDMI output
- ❧ Ethernet/Internet
- ❧ GPIO header
- ❧ (2) USB control input
- ❧ 5 VDC power input
- ❧ Uses relatively powerful (for its size) Broadcom processor
 - ❧ Broadcom BCM2835 system on a chip (SoC), which includes an ARM1176JZF-S 700 MHz processor

Raspberry Pi Online Course



⌘ <http://www.raspberrypi.org/>

⌘ But don't forget about YouTube™!

⌘ Many instructional and tutorial videos as we will see later.

Programming Languages for Raspberry Pi

- ☞ Scratch *
- ☞ Python *
- ☞ HTML5
- ☞ Java Script
- ☞ JQuery
- ☞ Java
- ☞ C
- ☞ C++
- ☞ PERL
- ☞ Erlang
- ☞ Wheezy *

Scratch



- Scratch is an entry-level programming language that comes as standard with the Raspberry Pi distribution, Raspbian.
- Scratch was originally created by the Lifelong Kindergarten Group at the MIT Media Lab in Boston, U.S., with an aim to help young people learn mathematical and computational concepts while having fun making things.

Python



- Python is one of the primary programming languages hosted on the Raspberry Pi. Did you know that Python is named after Monty Python's Flying Circus, the comedy team who brought us *Life of Brian*? (Which means Raspberry Pi is indirectly named after Monty Python, too.)
- References to the comedy show are encouraged in the documentation and examples. Guido Van Rossum, the Dutch programmer who created Python, was a big Monty Python fan. Python's supporters have given Guido the title of Benevolent Dictator for Life. Great title, eh?

HTML5



- ❧ HTML is the mark-up language that makes the World Wide Web tick. It was devised by Tim Berners-Lee while he was working at CERN in Geneva as a means to allow scientists in the organization to share their documents with each other. Before long, it went global.
- ❧ HTML is the primary building block of the Internet — it tells your browser how to lay out each web page, and lets one website link to another. The latest version is HTML5. Through its radical redesign, it's made embedding videos or audio into webpages or writing apps that will run on any smartphone or tablet easy.

Java Script



- ❧ JavaScript is a scripting language that works alongside HTML to add interactivity to websites. JavaScript was invented, and is maintained by, the World Wide Web Consortium, which also looks after HTML and CSS (Cascading Style Sheets).
- ❧ JavaScript adds client-side scripting to web browsers, which means you can create rollover buttons and drop-down menus and do calculations and a million other things. It got a new lease of life when it was combined with XML to become AJAX, which was adopted by companies such as Google and Yahoo to improve the usability of their online maps, among other things.

Java



- ☞ When Java arrived on the scene, it was greeted with open arms by developers as the first programming language with which you could write a program that would run on any operating system, Windows machines and Unix boxes alike, without having to re-write the code.
- ☞ This was a great leap forward. No longer did developers have to write in different languages for each operating system, or compile different iterations for every computer they wanted their code to run on. They could simply compile the code one time and it would run anywhere.
- ☞ It was originally designed for Interactive TV by its creators, James Gosling, Mike Sheridan, and Patrick Naughton, and is named after the Java coffee that the creators consumed in quantity.

JQuery



jQuery is the most popular JavaScript library. It runs on any browser, and it makes the scripting of HTML considerably simpler. With jQuery, you can create rich web interfaces and interactive components with just a small amount of JavaScript knowledge.

C Programming Language



- ❧ The C Programming language was written by Dennis Ritchie, using Brian Kernighan's B language as its model. C is one of the most widely used languages in the world, utilized in everything from complete operating systems to simple programming languages. Linux, the operating system that runs the Raspberry Pi, is largely written in C and is built into all Linux and Unix systems.
- ❧ The design for C influenced a great many other programming languages, including Python, Java, JavaScript, and a programming language called D. It was also extended as Objective C, which is the language used to write apps for iPhones™ and iPads™.

C++



☞ C++ was developed by the Danish developer Bjarne Stroustrup as a way to enhance C. C++ is used in a million different circumstances, including hardware design, embedded software (in mobile phones, for example), graphical applications, and programming video games. C++ adds object-oriented features to C. Other object-oriented languages are Java, Smalltalk, Ruby, and .Net.

Perl



- ❧ Perl has been called the "duct tape that holds the Internet together" and the "Swiss Army chainsaw of scripting languages." It was given these names because of its flexibility and its adaptability. Before Perl came along, the Internet was but a collection of static pages.
- ❧ Perl added a dynamic element, which meant that for the first time, websites could be put together on the fly. Among other things, it enabled ecommerce and sites such as Amazon and eBay to come into being.

Erlang



- ❧ Erlang is a programming language used when there is no room for failure. You might use Erlang if you were running a nuclear power plant or if you were designing a new air traffic control system: mission-critical situations where the computer breaking down would spell disaster.
- ❧ With Erlang, you can create programs that run across several computers. It's designed so that if one computer fails, the others make up for it, which means the system never goes down.

Erlang



- ⌘ Anyone ever hear of the “term Erlang” before?
- ⌘ What is an “Erlang?”
 - ⌘ Definition: The **Erlang** (symbol $E^{[1]}$) is a dimensionless unit that is used in telephony as a measure of offered load or carried load on service-providing elements such as telephone circuits or telephone switching equipment.

Raspbian *Wheezy*



- ❧ Raspbian is an unofficial port of Debian Wheezy armhf with compilation settings adjusted to produce optimized "hard float" code that will run on the Raspberry Pi. This provides significantly faster performance for applications that make heavy use of floating point arithmetic operations. All other applications will also gain some performance through the use of advanced instructions of the ARMv6 CPU in Raspberry Pi.
- ❧ Although Raspbian is primarily the efforts of Mike Thompson (mptompson) and Peter Green (plugwash), it has also benefited greatly from the enthusiastic support of Raspberry Pi community members who wish to get the maximum performance from their device.
- ❧ Wheezy comes with Scratch, Python, Web browser.

Raspberry Pi



- ❧ While the Raspberry Pi was originally developed for students in the U.K. And while it is small and compact, uses far outside the classroom have been developed.
- ❧ In fact, a little over a year ago the manufacturer of the Pi had to suspend and limit shipments to no academic customers because the call for the little computer outstripped product.
- ❧ A little computer than do so much for less than \$50US with case.
 - ❧ But keyboard, monitor and mouse is required for set-up.

Raspberry Pi Uses:



☞ I use mine for:

- ☞ D-Star DVAP node – allows me to reach any D-Star repeater or reflector anywhere in the world via my HT and an Internet connection- wireless or direct input.



Raspberry Uses:



- ❧ Other hams use it as part of an IRLP Node,
- ❧ Use if for APRS, digipeater, packet station controller,
- ❧ Others use if for coding for the Web,
- ❧ Weather station,
- ❧ Media Center using OpenELECT OS at home,
 - ❧ Or in the car! (*Careful here!*)

Coder



You can use coder for developing code for web apps. Coder is a free, open source project that turns a Raspberry Pi into a simple platform that educators and parents can use to teach the basics of building for the web. New coders can craft small projects in HTML, CSS, and Javascript, right from the web browser.

<http://googlecreativelab.github.io/coder/>

Raspberry Pi Basic Tutorial



☞ Tutorial 1: The Basics:

☞ http://www.youtube.com/watch?v=Jj4pjfU_-jo

☞ Tutorial 2: The Connections:

☞ <http://www.youtube.com/watch?v=nqPfo4sZDks>

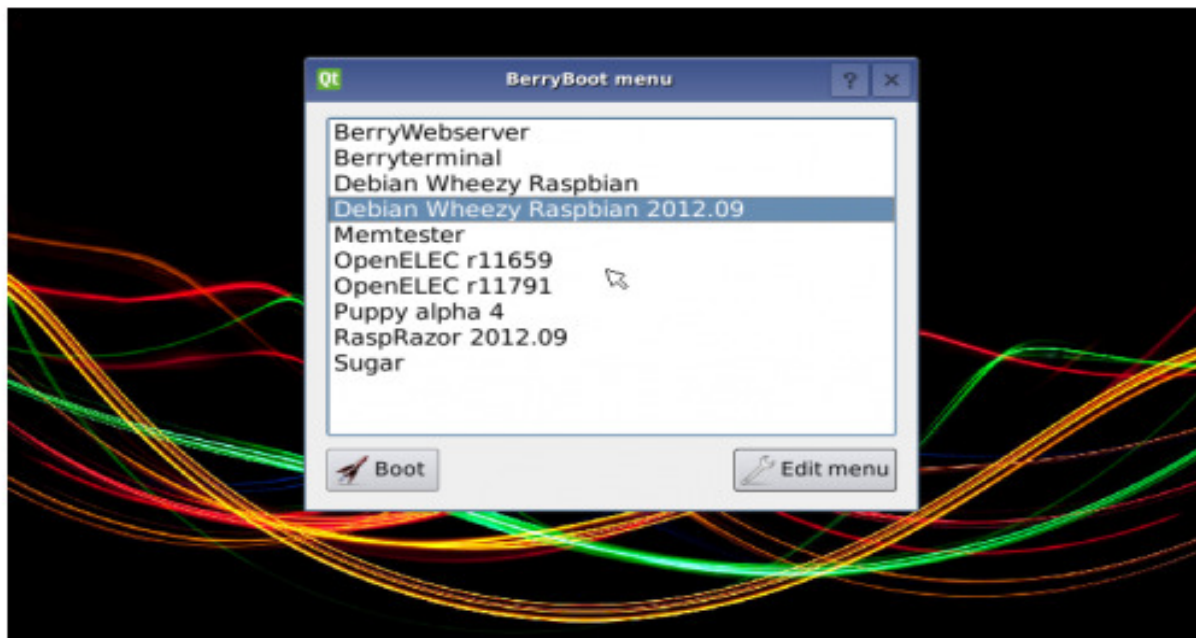
☞ Tutorial 3: Installing Your Own OS on SC Card

☞ http://www.youtube.com/watch?v=pqTsMWI_noA

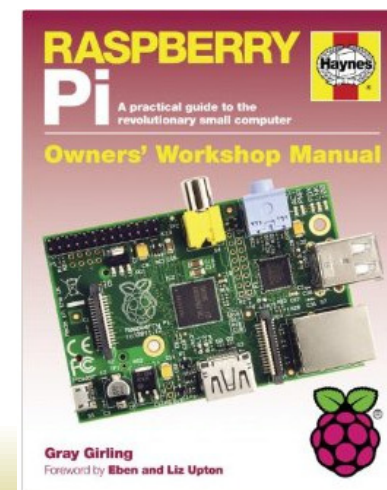
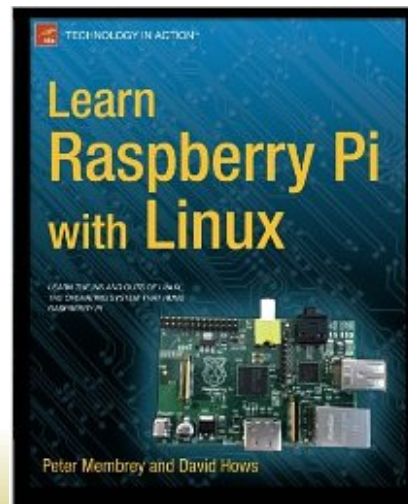
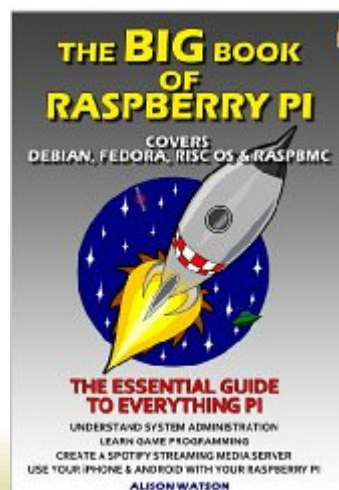
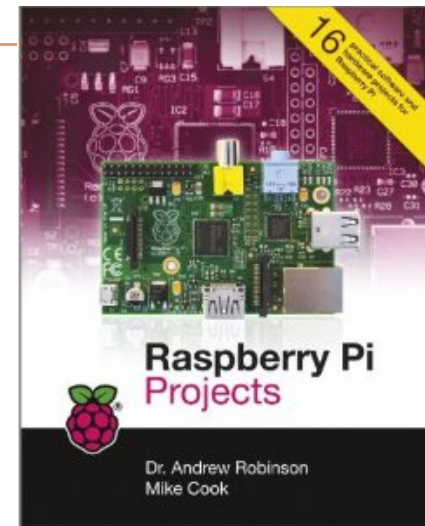
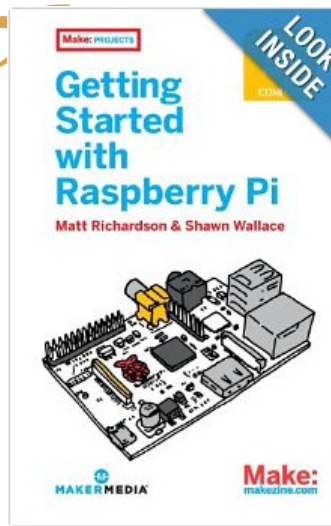
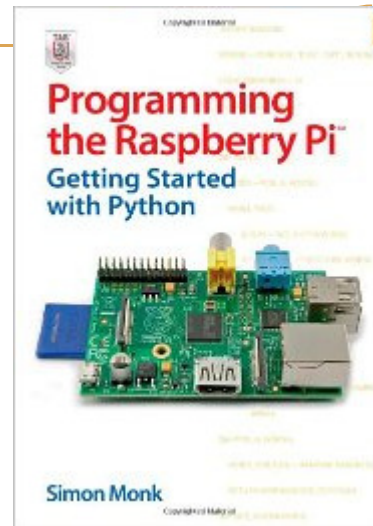
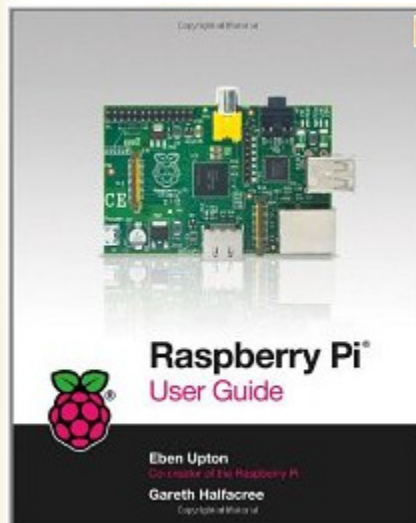
BerryBoot



BerryBoot v2.0 - bootloader / universal operating system installer



Reference Books



Raspberry Pi



❧ Why is it called Raspberry Pi?

❧ Ans: Because “Apple” was taken.

❧ Secondly, next to Apple, Raspberry was the developers favor pie.

❧ Time for a brief application demo.