**Raspberry Pi Resources**

Raspberry Pi Website

<https://www.raspberrypi.org/>

[Etcher - an SD card flasher](https://moodle.itb.ie/mod/url/view.php?id=210826)

<https://www.balena.io/etcher/>

How to do a "Headless" Raspberry Pi setup (no monitor, keyboard or cable required). URL

<https://howtoraspberrypi.com/how-to-raspberry-pi-headless-setup/>

GPIO pinout

<https://www.raspberrypi.org/documentation/usage/gpio/>

Angry IP Scanner

<https://angryip.org/>

VNC on Raspberry Pi

<https://www.raspberrypi.org/documentation/remote-access/vnc/>

WiringPi gpio utility

<https://projects.drogon.net/raspberry-pi/wiringpi/the-gpio-utility/>

Basic Command Line GPIO control URL

<https://raspberry-projects.com/pi/command-line/io-pins-command-line/io-pin-control-from-the-command-line>

Example or reading and writing GPIO pin from commandline & C++ URL

<http://hertaville.com/introduction-to-accessing-the-raspberry-pis-gpio-in-c.html>

### Linux multi processing/threading

A gentle introduction to UNIX processes URL

<https://www.ibm.com/developerworks/aix/library/au-speakingunix8/index.html>

An Introduction to Linux/Unix Processes URL

<https://www.brianstorti.com/an_introduction_to_unix_processes/>

More on Processes URL

<https://www.tutorialspoint.com/unix/unix-processes.htm>

C Processes Tutorials URL

<https://www.cs.rutgers.edu/~pxk/416/notes/c-tutorials/index.html>

fork() tutorial URL

<https://www.eg.bucknell.edu/~cs315/Spring07/labs/lab01/ForkTutorial.pdf>

fork() and exec() URL

<https://www.softprayog.in/programming/creating-processes-with-fork-and-exec-in-linux>

exec function variations URL

<https://en.wikipedia.org/wiki/Exec_(system_call)>

Process Signals URL

<http://www.cs.kent.edu/~ruttan/sysprog/lectures/signals.html>

SIGHUP URL

<https://en.wikipedia.org/wiki/SIGHUP>

errno URL

<https://www.tutorialspoint.com/cprogramming/c_error_handling.htm>

errno manpage URL

<http://man7.org/linux/man-pages/man3/errno.3.html>

Function Pointer Tutorial URL

<https://www.cprogramming.com/tutorial/function-pointers.html>

pThreads tutorial URL

<http://homes.di.unimi.it/~boccignone/GiuseppeBoccignone_webpage/MatDidatSOD2009_files/pthread-Tutorial.pdf>

pthreads reference URL

<https://computing.llnl.gov/tutorials/pthreads/>

select/poll/epoll URL

<https://jvns.ca/blog/2017/06/03/async-io-on-linux--select--poll--and-epoll/>

The original select() function URL

<https://www.gnu.org/software/libc/manual/html_node/Waiting-for-I_002fO.html#Waiting-for-I_002fO>

epoll man page URL

<http://man7.org/linux/man-pages/man7/epoll.7.html>

Low Level File Access URL

<https://www.c-sharpcorner.com/UploadFile/a5f59f/high-level-and-low-level-inputoutput-functions-in-c-languag/>

Low Level File Access Documentation (libC documentation) URL

<https://www.gnu.org/software/libc/manual/html_node/I_002fO-Overview.html#I_002fO-Overview>

Beej's Guide to Unix IPC - good easy read on processes etc.

<https://beej.us/guide/bgipc/html/single/bgipc.html>

### NodeMCU - ESP8266

NodeMcu URL

<https://www.nodemcu.com/index_en.html>

NodeMcu Lua Documentation URL

<https://nodemcu.readthedocs.io/en/master/>

NodeMcu using Arduino Environment URL

<https://www.teachmemicro.com/intro-nodemcu-arduino>

NodeMcu LED control from Web URL

<https://www.instructables.com/id/Quick-Start-to-Nodemcu-ESP8266-on-Arduino-IDE/>

Connecting NodeMCU to Watson IoT URL

<https://developer.ibm.com/recipes/tutorials/connect-an-esp8266-with-the-arduino-sdk-to-the-ibm-iot-foundation/>

MQTT Library Tutorial URL

<https://slashposts.com/2018/04/mqtt-pubsubclient-tutorial-for-arduino-esp8266-esp32/>

ESP8266 SDK Tutorials URL

<https://hackaday.io/project/160006-esp8266-sdk-tutorials/details>

Intro to ESP8266 Native Development URL

<http://iot-bits.com/documentation/esp8266-programming-tutorial-documentation/>

Expressif ESP8266 website URL

<http://iot-bits.com/documentation/esp8266-programming-tutorial-documentation/>

ESP8266 SDKs URL

<https://github.com/espressif>

Tensilica SoC URL

<https://en.wikipedia.org/wiki/Tensilica>

Xtensa SoC

<http://domoticx.com/sdk-esp8266-xtensa-architecture-toolchain/>

### Sockets

sockets1 File 726.1KB PDF document

More on Sockets URL

<https://www.cs.dartmouth.edu/~campbell/cs50/socketprogramming.html>

Beej's Guide to Sockets URL

<https://beej.us/guide/bgnet/html/single/bgnet.html>

Socket Example Code URL

<https://www.codeproject.com/Articles/586000/Networking-and-Socket-programming-tutorial-in-C>

HTTP Basics URL

<https://www.ntu.edu.sg/home/ehchua/programming/webprogramming/HTTP_Basics.html>

Learn JSON in 10 mins...

<https://beginnersbook.com/2015/04/json-tutorial/>

### 802.15.4 & 6LoWPAN

Wikipedia - 802.15.4 URL

<https://en.wikipedia.org/wiki/IEEE_802.15.4>

Intro to 802.15.4 and 6LowPAN File 288.5KB PDF document

802.15.4 Tutorial File 1.1MB PDF document

6LoWPAN Demistified File 779.8KB PDF document

MAC Addresses URL

<https://www.lifewire.com/introduction-to-mac-addresses-817937>

CoAP URL

<http://coap.technology/>

Intro to Network Encryption URL

<https://www.lifewire.com/introduction-to-network-encryption-817993>

Contiki-NG URL

<http://contiki-ng.org/>

cc2650stk sensortag rel.hex File 337.9KB Text file

What is a container? (docker) URL

<https://www.docker.com/resources/what-container>

jool.mx - a NAT64 implementation for Linux URL

<http://jool.mx/en/index.html>

Connecting the Contiki WebDemo to your Watson IoT URL

<https://sunmaysky.blogspot.com/search/label/IBM%20Watson%20IoT%20platform>

6LoWPAN YouTube Playlist URL

<https://www.youtube.com/playlist?list=PL3BlGn_kOHaWgUTBD2eNNKGwuIc5IjdJ6>

Adding VirtualBox Guest Additions in Linux Guest Machine Page

**Adding VirtualBox Guest Additions in Linux Guest Machine**

1. Devices->Insert Guest Additions CD image...
2. sudo apt-get update
3. sudo apt-get install module-assistant
4. sudo m-a prepare
5. cd /media/<your username>/VBox\_GAs\_X.X.XX
6. sudo ./VBoxLinuxAdditions.run

Raspberry Pi Kernel headers URL

<https://www.raspberrypi.org/documentation/linux/kernel/headers.md>

On the Pi you need to install these kernel headers - replace the command in the Jool setup with the one found at this link.

**Symlink required to build Jool**

After installing the raspberrypi kernel headers if you immediately try to build Jool it fails with a "make[3]: \*\*\* /lib/modules/4.14.79+/build: No such file or directory.  Stop." error.

Due to the vagaries of the raspberry pi setup (required to support all the different variants) the kernel headers get set up in a directory called "/lib/modules/4.14.98+/build" - which is not the kernel version reported by "uname -r", 4.14.79+.

To get the build working all we need to do is create a shortcut (symlink) from 4.14.98+/build to 4.14.79+/build.

* sudo ln -s /lib/modules/4.14.98+/build/ /lib/modules/4.14.79+/build