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Programming Hardware with Python Workshop – Staff Edition

Prerequisites: (All should be provided, except python knowledge)

* Basic Knowledge of Python
* Raspberry Pi
* Keyboard
* Mouse
* Monitor

Overview:

1. Introduction
   1. This workshop will focus on lower-level functions of computers. What makes them work, operating systems, web connections, etc.
   2. We will be coding primarily in Python, a relatively easy language that will make it easier to grasp these concepts through experience
2. Present PowerPoint Presentation
3. Introduction to Raspberry Pi
   1. Build a quick hello world program in RP Python editor
4. Move on to operating system commands, becoming familiar with terminal commands.
5. Working with OS in Python, creating/moving/renaming/etc. files, overview of Python os module
   1. Project idea (If there are enough students) have kids search entire directory for a specific file I will hide before workshop
6. Moving on to web hosting and networks, we may not get all the way through this part
   1. Teach briefly about how local networks work, connections between machines, port numbers, and how this is different than the open internet.
   2. Have them learn how to scan ports on the network. (maybe if we have enough people and enough time, hide a process on a certain port and see if they can find it as an added challenge.)
   3. Teach how to make websites, web servers in python. Have them run server and view on another computer to see its effect.
7. Discuss future possibilities: (Check links below) emphasize Raspberry Pi’s versatility and that it can be used with a number of extensions.

Looking to advance your knowledge even more? Check out these links:

**Useful Python Commands:** <https://overapi.com/python>

**Python OS module:** <https://docs.python.org/3/library/os.html>

**Project Ideas:** <https://raspberrytips.com/python-projects-on-raspberry-pi/>

**Important commands in Linux:** <https://www.hostinger.com/tutorials/linux-commands>

**Port forwarding (Make sure you have parental consent and understand risks first):**

<https://portforward.com/how-to-port-forward/>