My project stems from the need or interest in monitoring a systems vital information. There are many reasons one might be interested in information such as CPU/RAM usage or GPU temperature etc. My particular use for this is to keep track of this information while playing games or overclocking. The problem that I am trying to solve is necessity of a dedicated monitor to display the info, and the fact that system crashes are frequent when overclocking. Using a raspberry pi plan to create an external hardware monitor that runs independent of the host PC and within its own screen/GUI. A separate system with its own screen will solve both issues that I have described. Single monitor desktops and laptops can have a small piece of hardware out of the way but easy to read which will be able to retain data if the PC ends up crashing.

Ideal functionality would allow the user to choose what data is displayed, how they would like it presented, and more options for polling frequency. Graphing data over time or plain text display with a min/max/average indicator are possibilities. The main pieces of data I will focus on will be CPU and GPU usage and temperatures as well as RAM usage. Other useful metrics may be storage capacities of internal drives, CPU or GPU clock speeds, and GPU memory usage.

Techniques needed will be Python programming, which I have started learning the basics of using Youtube tutorials and other online sources. Within Python research suggests implementing the Tkinter toolkit for the GUI and the matplotlib library which supports live graph updating within Tkinter. The information I need will be scraped from a remote web server that Open Hardware Monitor supports while the software is running. I have already tested this using the local IP of my PC at home and other computers. The hardware required is just the raspberry pi and a screen for viewing. I chose the Pimoroni HyperPixel - 4.0" Hi-Res Display for Raspberry Pi non touch version for this. It is 39.95 at adafruit.com and it connects to the pi via GPIO rather than HDMI. The 4-inch display sits directly on top of the pi making it incredibly compact with no extra wires required.

I have already begun learning the techniques required and purchased the screen. The rest of my work plan will be developing the program which will read and display to the screen. First, I will work on scraping data from the web server as plain text for testing. After that is available to use, I will work on the GUI portion for a cleaner look. I have been unable to find a similar project or solution in any capacity online which drove me to create a solution and possible share online as well. I have found plenty of resources online for scraping websites in python, using the Tkinter GUI toolkit, and matplotlib. One standout is sentdex on Youtube who has a tutorial and explanation on how he created an auto updating bitcoin price tracking application in python using these techniques. He has an enormous amount of information and options but the basics seem to be what I need to look at.