CSCI-460 Project Proposal
by
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For our final project we intend to build our own microkernel for a Raspberry Pi Zero W. We hope to build a microkernel that can successfully: boot, dispatch a process, and manage memory. If successful with these initial attempts, we hope to further the development of this project by having a kernel that can schedule and dispatch at least two processes while allowing inter-process communication. We also hope to implement UNIX like commands for the command line. Possibly even allowing users to work with file systems. However, before attempting any of the extra functionalities, we would like to have the initial goals be functional.

In terms of a timeline, we plan on starting development on 11/08/2019. By 11/12/2019 we would like to have a barebones version of a microkernel that boots successfully. This means that the raspberry pi is able to go through the boot loader and finish by printing some output. After this we will start to build the microkernel and hopefully get it almost fully functional in terms of the initial goals by 11/24/2019. If everything does go to plan, we will start working on implementing the extra functionalities after 11/24/2019. However, if not everything does go to plan, then we will continue to develop the initial goals up to the presentation.

In terms of splitting work up, due to the complexity of the project we plan to perform pair programming. Therefore, both members will work on the entirety of the project together, assisting in whatever way possible.

Our hope with attempting this project is to implement a couple fundamental components of an OS that furthers our understanding and rounds out topics we have learned in class this semester. We realize that this is an ambitious project, but we are willing to put in the time to perfect everything we have learned. Overall, we look forward to building our microkernel.

Here is a source we are planning on using to start the initial stages of our project: https://wiki.osdev.org/Raspberry_Pi_Bare_Bones. This url contains a linked boot file and and basic kernel. We will be using this layout initially to get the microkernel able to boot, then we will further extend off of this. The final deliverable for this project will be a GIT repo with the code that implements our microkernel. It will also include a markdown file

that outlines the features we implemented as well as how a person would run our code on a Raspberry Pi Zero.