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Project Phase 2 Report

Project Goal:

This project is aimed to create a kernel module in Arch Linux and import the *pthread program* from phase 1 as the kernel. However, since pthread won't be used in a kernel module, a kernel thread (kthread) sorting program is used in this kernel module.

Project Procedure:

First of all, a kernel module was created with *simple.c* document and compiled with Makefile. Then it was tested with both *insmod* and *dmesg* commands to insert and run the module to make sure it was running correctly. Then a *rmmod* and *dmesg* command was used to remove the module.

Kthread_sort:

In this *kthread_sort* kernel module, a bubble sort sorting algorithm was used for sorting the array. A sorting function named *sorter* was created at first, then a function *sort_fn()* needed for kthread execution was created. Next, the kernel module was initialized with the *static void __init init_thread()* function. Inside the initialization, *kthread_run()* was used for creating and running the kthread. Inside the *kthread_run()* function, *sort_fn()* function is called to sort the array, print original array, and print the sorted array. *Printk()* is used here for printing the output. Then, the *static void __exit cleanup_thread()* function is used to exit the module. At last, *init_module()* and *exit_module()* are used to initiate and exit the module.

Again, *insmod* and *dmesg* were used to insert and run the module. The original array and sorted array was a successfully print out.

The output of module insertion (*output_lsmod.txt*) and output of dmesg (*output_dmesg.txt*) were also created to show the module ran successfully.