CS4375-13948 Fall 2023
Sonam S Tshering
sstshering@miners.utep.edu

Homework Report
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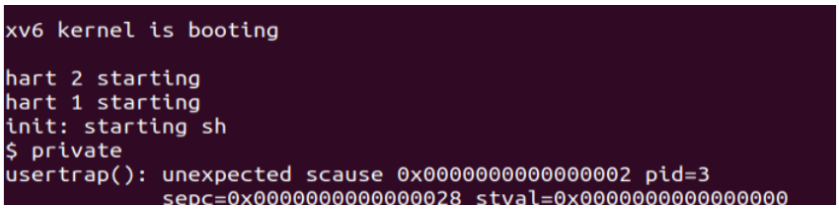
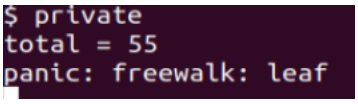
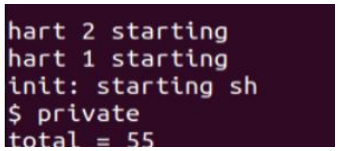
UG HW5: Anonymous Memory Mappings for xv6

Task 1. a-c/

The mmap() func is employed to create a shared mem region, while munmap() is used to release the allocated mem once the execution of private.c is comple. The program faces an abort due to store page fault. Addressing the fault in usertrap(), I implemented a loop to traverser the mapped pages ensuring each page has correct permissions. The panic observed is a result of mem not being unmapped post program execution and uncommenting the code section resolves the panic.

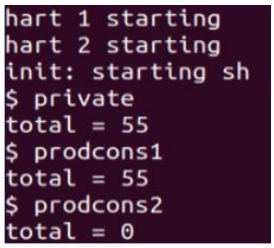






Task 2. a-c/

uvmcopy() is responsible for copying virtual mem from the parent process to the child process when the mem is not intended to be shared. uvmcopyshared() is used when mem regions are intended to be shared. The calls are based on the mem mapped region. The results differ between prodcons1 and prodcons2 due to mem mapping regions being shared or private.



Task 3. a-b/

The incorrect results in this task stem from the parent process not being able to observe changes made by the child process after execution of fork().

The tasks provided insights into how xv6 creates the illusion of a larger virtual space through mem mapping techniques.