Forfattere:
13.07-89 Rane Eriksen BVL193
dd.mm-yy Christian Efternavn NUMMERPLADE 14.06-79 Sebastian O. Jensen GJX653
Hold 1

Datalogisk Institut

Københavns Universitet

OSM

G-Assignment 1

15. februar 2015

UNIVERSITY OF
COPENHAGEN

Indhold

Rane Eriksen BVL193
Christian Efternavn ??????
Sebastian O. Jensen GJX653

0.1 Task 1. A priority queue

notes

The max-heap data structure is a tree structure with the priority that the root element always contains the element with the highest value. Inserting elements and removing the root element has a runing time of O(log n). Therefore it makes a good structure for a priority queue, and can be used to improve the current priority queue with a running time of $O(n^2)$

The implementation of the heap priority queue are as follow:

Heap initialize(heap *h) initialize a new heap by allocating size for a heap array and initialize the size of the elements in the heap

$\text{heap}_clear(heap * h)willfreethememoryusedbyapriorityqueue$

$\text{heap}_sizereturnthesizeoftheheap$

$\text{heap}_insertinsertanelementintotheheapandsortheheaptomaintaintheheapproperties.Iftheh$

$\text{heap}_popreturntherootelementwhichistheelementwithhighestpriorityandthensortheheapton$

Implementation

Rane Eriksen BVL193
Christian Efternavn ??????
Sebastian O. Jensen GJX653

0.2 Task 2. Buenos system calls for basic I/O

notes

Implementing Buenos syscall read and write.

In the folder test a usserland program which make calls to read and write is implemented. The program is named readwrite. Readwrite make use of file the test/lib.c which already define functions to call the two syscall functions. Read and write both has three arguments filehandle, buffer and length. Filhandle is normaly a file. But you can also read or write to stdin or stdout as they are both considered as files by the system. In proc/syscal.h the stdin and stdout filehandlers are defined to 0 and 1 respectively. The buffer argument is the buffer were to the content is written to or read from. The length are the maximum length to read or write. The return value is the length of the read or written characters or -1 if the syscal failed. When a syscal is made, the number corresponding to the syscall as defined in proc/syscall.h is saved to mips register A0. The arguments are stored in mips register A1, A2, A3. When the syscall return the return value is saved to register V0.

$\text{syscall}_{h}andleinproc/syscall.carehandlelingthesystemcallbycallingthesyscallfunctionwhichi$
$1ifitfailed$

read.c defines the function $\text{syscall}_{r}eadReadalsomakeuseofthegcddriver.Itreadsonecharactera$
$1ifitfailedThefilekernel/module.mkisamakefilethatishandlingthecompilationofthekernelmo$
$_{i}nterrupt.S$??????????
main.c ???????????

Implementation