

CSC3150

Assignment #3

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- **Environment of running your program.**

OS : Windows 10

Used CSC4005 server to run a program.

1. Connect school vpn.
2. ssh 117010437@10.26.1.30
3. cd ..
4. cd pvfsmnt
5. put source into that folder using SFTP.

- **Execution steps of running your program.**

1. Put source into folder.
2. cd source
3. write command below

```
nvcc main.cu user_program.cu virtual_memory.cu -o ./csc3150-a3 -ccbin=/opt/rh/devtoolset-10/root/usr/bin/g++ --relocatable-device-code=true
```

4. run command

```
srun ./csc3150-a3
```

- **How did you design your program?**

1. Return input_size and use functions of vm_init and init_invert_page_table to reset about virtual memory and page table.
2. For idx_search function, I set two parameters which are object of vm and idx_page. Use for loop to move page and return rw if index can readable. First I set idx = 0 and used for loop again to compare values of LRU_SET. It needed to have a space about buffer data and it is page table * index so from 0 to page size, used for loop again. And I changed to disk to new data so saved data should update so pagetable[idx] should = idx_page
3. For read, get physical memory address, and finish calculation and directly return to value

in buffer

4. For write, divided addr into pagesize first. It is virtual address and rest of them are offset in buffer. After that I used idx_search to get physical memory, calculate new address and put new value, copy new data.
5. For snapshot, get result, and use for loop and vm_read function. Each loop load each result buffer and load to snapshot.bin.

- **What's the page fault number of your output?**

Page fault number : 8721

Got it from vm_write function and from snapshot operation.

- **What problems you met in this assignment and what are your solution?**

Problem for me was how to run this code → TA team told me to use csc4005 server.

LRU_SET update → used positive int number to change / update

I think page fault number has some issue(?) but don't know how to change it so I left.

- **Screenshot of your program output.**

```
-bash-4.2$ cd pvfsmt
-bash-4.2$ cd 117010437
-bash-4.2$ cd source
-bash: cd: source: No such file or directory
-bash-4.2$ ll
total 4
drwxr-xr-x 1 117010437 117010437 4096 Nov 10 19:11 Source
-bash-4.2$ cd Source
-bash-4.2$ ll
total 1068
-rwxrwxr-x 0 117010437 117010437 804896 Nov 10 19:11 csc3150-a3
-rw-r--r-- 0 117010437 117010437 131072 Nov 10 19:11 data.bin
-rw-r--r-- 0 117010437 117010437 2995 Nov 10 19:11 main.cu
-rw-r--r-- 0 117010437 117010437 131072 Nov 10 16:41 snapshot.bin
-rw-r--r-- 0 117010437 117010437 411 Nov 10 19:11 user_program.cu
-rw-r--r-- 0 117010437 117010437 3036 Nov 10 19:11 virtual_memory.cu
-rw-r--r-- 0 117010437 117010437 1008 Nov 10 19:11 virtual_memory.h
-bash-4.2$ nvcc main.cu user_program.cu virtual_memory.cu -o ./csc3150-a3 -ccbin=/opt/rh/devtoolset-10/root/usr/bin/g++ --relocatable-device-code=true
main.cu(89): warning: conversion from a string literal to "char *" is deprecated
main.cu(108): warning: conversion from a string literal to "char *" is deprecated
main.cu(89): warning: conversion from a string literal to "char *" is deprecated
main.cu(108): warning: conversion from a string literal to "char *" is deprecated
-bash-4.2$ srunk ./csc3150-a3
input size: 131072
pagefault number is 8721
```

- **What did you learn from this assignment?**

After I finish modifying, I realized and get know about cuda programming and understood about the work of physical and virtual memory and page table.