

Lab 4 Report

shm.c

- In shm_open, we first check if the id we are opening already exists. If it exists we get the physical address and use mappages
- Va is sz rounded up
- Increment refcnt and return it
- If the id does not exist we set the id to the id passed in
- Use kmalloc and use memset to store address in frame
- Refcnt is set to 1

```
31 int shm_open(int id, char **pointer) {
32
33     int i = 0;
34     acquire(&(shm_table.lock));
35     for(i = 0; i < 64; i++){
36         if(shm_table.shm_pages[i].id == id){
37             uint va = PGROUNDUP(myproc()->sz);
38             mappages(myproc()->pgdir, (void*)va, PGSIZE, V2P(shm_table.shm_pages[i].frame), PTE_W|PTE_U);
39             shm_table.shm_pages[i].refcnt += 1;
40             *pointer = (char*)va;
41             release(&(shm_table.lock));
42             return va;
43         }
44     }
45     for(i = 0; i < 64; i++){
46         if(shm_table.shm_pages[i].id == 0) { //DNE
47             uint va = PGROUNDUP(myproc()->sz);
48             shm_table.shm_pages[i].id = id;
49             shm_table.shm_pages[i].frame = kalloc();
50             shm_table.shm_pages[i].refcnt = 1;
51             memset(shm_table.shm_pages[i].frame, 0, PGSIZE);
52             mappages(myproc()->pgdir, (void*)va, PGSIZE, V2P(shm_table.shm_pages[i].frame), PTE_W|PTE_U);
53             *pointer = (char*)va;
54             release(&(shm_table.lock));
55             return va;
56         }
57     }
58
59
60
61     release(&(shm_table.lock));
62     return 0; //added to remove compiler warning -- you should decide what to return
63 }
```

- If id is found we decrement refcnt
- If refcnt gets to 0 it clears the table

```

66 int shm_close(int id) {
67     int i = 0;
68     acquire(&(shm_table.lock));
69     for(i = 0; i < 64; i++){
70         if(shm_table.shm_pages[i].id == id){
71             shm_table.shm_pages[i].refcnt -= 1; //page not being used anymore
72             if(shm_table.shm_pages[i].refcnt == 0){
73                 shm_table.shm_pages[i].id = 0;
74                 shm_table.shm_pages[i].frame = 0;
75                 break;
76             }
77         }
78     }
79 }
80
81
82
83 release(&(shm_table.lock));
84 return 0; //added to remove compiler warning -- you should decide what to return
85 }

```

```

$ shm_cnt
Counter in Parent is 1 at address 4000
Counter in Parent is 1001 at address 4000
Counter in Parent is 2001 at address 4000
Counter in Parent is 3001 at address 4000
Counter in Parent is 400Counter in Child is 4002 at address 4000
Counter in Child is 5002 at address 4000
Counter in Child is 6002 at address 4000
Counter in Child is 7002 at address 4000
Counter in Child is 8002 at ad1 at address 4000
Counter in Parent is 9002 at address 4000
Counter in Parent is 10002 at address 4000
Counter in Parent is 11002 at address 4000
Counter in Parent is 12002 at address 4000
dress 4000
Counter in Child is 13002 at address 4000
Counter in Child is 14002 at address 4000
Counter in Child is 15002 at address 4000
Counter in Child is 16002 at address 4000
Counter in ChCounter in Parent is 18002 at address 4000
Counter in parent is 19001
ild is 17002 at address 4000
Counter in child is 20000

```