CLASS ASSIGNMENT – 4
ID : 12341550
DATE : 03-09-2025

STEP 1

FILE : syscall.h

```
#define SYS_numvp 27
#define SYS_numpp 28
#define SYS_getptsize 29
```

STEP 2

FILE : user.h

```
int numvp(void);
int numpp(void);
int getptsize(void);
```

STEP 3

FILE : sysproc.c

```
extern pte_t* walkpgdir(pde_t *pgdir, const void *va, int
alloc);
...
int sys_numvp(void)
{
  struct proc *p = myproc();
  return (p->sz + PGSIZE - 1) / PGSIZE + 1;
}
```

```
int sys_numpp(void)
{
  struct proc *p = myproc();
  pte_t *pte;
  int count = 0;
  for (uint a = 0; a < p->sz; a += PGSIZE)
  {
    pte = walkpgdir(p->pgdir, (void *)a, 0);
    if (pte && (*pte & PTE_P))
      count++;
  }
  return count;
}


int sys_getptsize(void)
{
  struct proc *p = myproc();
  int count = 1; // outer page directory
  for (int i = 0; i < NPDENTRIES; i++)
    if (p->pgdir[i] & PTE_P)
      count++;
  return count;
}
```

STEP 4

FILE : syscall.c

```
extern int sys_numvp(void);
extern int sys_numpp(void);
extern int sys_getptsize(void);

[SYS_numvp] sys_numvp,
[SYS_numpp] sys_numpp,
```

[SYS_getptsize] sys_getptsize,

FILE : usys.S

SYSCALL(numvp)
SYSCALL(numpp)
SYSCALL(getptsize)

STEP 5

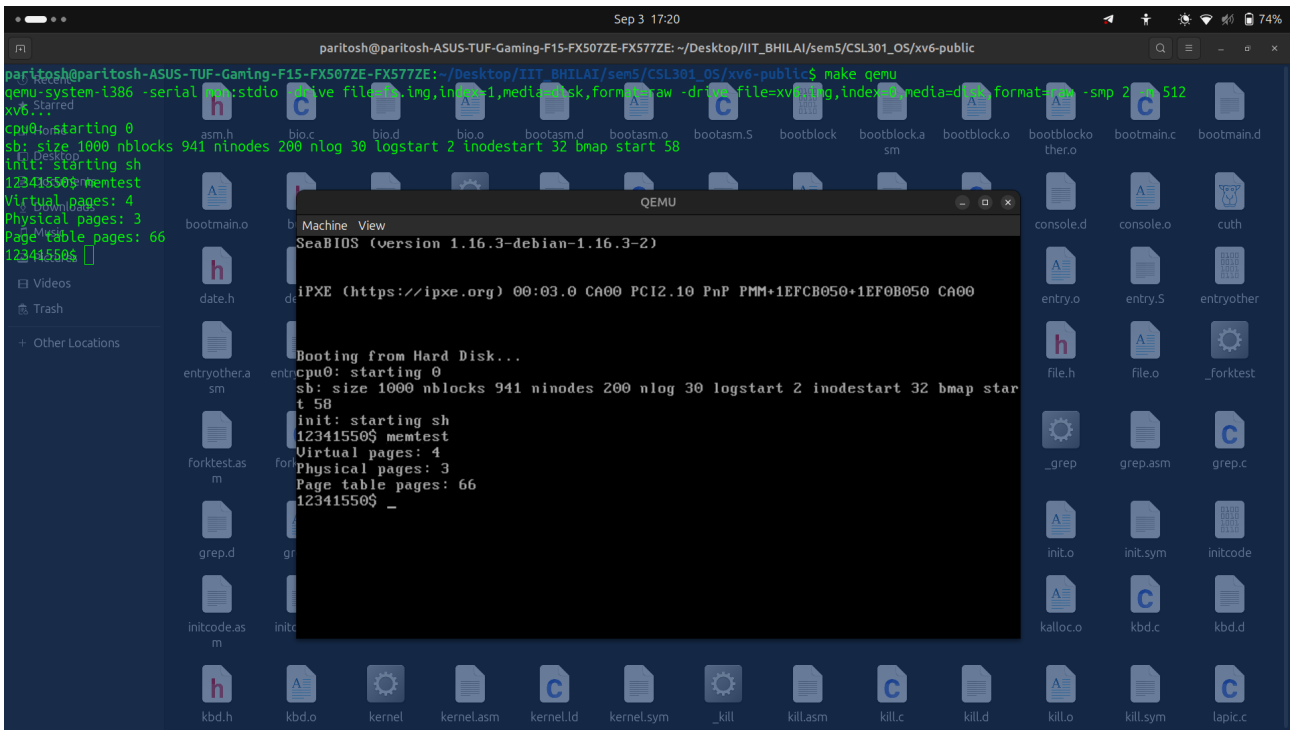
FILE : memtest.c

```
#include "types.h"
#include "stat.h"
#include "user.h"
int main(void){

    printf(1, "Virtual pages: %d\n", numvp());
    printf(1, "Physical pages: %d\n", numpp());
    printf(1, "Page table pages: %d\n", getptsize());
    exit();

}
```

OUTPUT :


Sep 3 17:20
74%
paritosh@paritosh-ASUS-TUF-Gaming-F15-FX507ZE-FX577ZE: ~/Desktop/IIT_BHILAI/sem5/CSL301_OS/xv6-public
paritosh@paritosh-ASUS-TUF-Gaming-F15-FX507ZE-FX577ZE:~/Desktop/IIT_BHILAI/sem5/CSL301_OS/xv6-public$ make qemu
qemu-system-i386 -serial mon:stdio -drive file=fs.img,index=1,media=disk,format=raw -drive file=xv6.img,index=0,media=disk,format=raw -smp 2 -m 512
xv6...
cpu0: starting 0
sb: size 1000 nblocks 941 ninodes 200 nlog 30 logstart 2 inodestart 32 bmap start 58
init: starting sh
12341550$ memtest
Virtual pages: 4
Physical pages: 3
Page table pages: 66
12341550$
QEMU
Machine View
SeaBIOS (version 1.16.3-debian-1.16.3-2)
iPXE (https://ipxe.org) 00:03.0 CA00 PCI2.10 PnP PMM+1EFCB050+1EF0B050 CA00
Booting from Hard Disk...
cpu0: starting 0
sb: size 1000 nblocks 941 ninodes 200 nlog 30 logstart 2 inodestart 32 bmap start 58
init: starting sh
12341550$ memtest
Virtual pages: 4
Physical pages: 3
Page table pages: 66
12341550$ _