

VE482 Homework 2

Due: Oct.4

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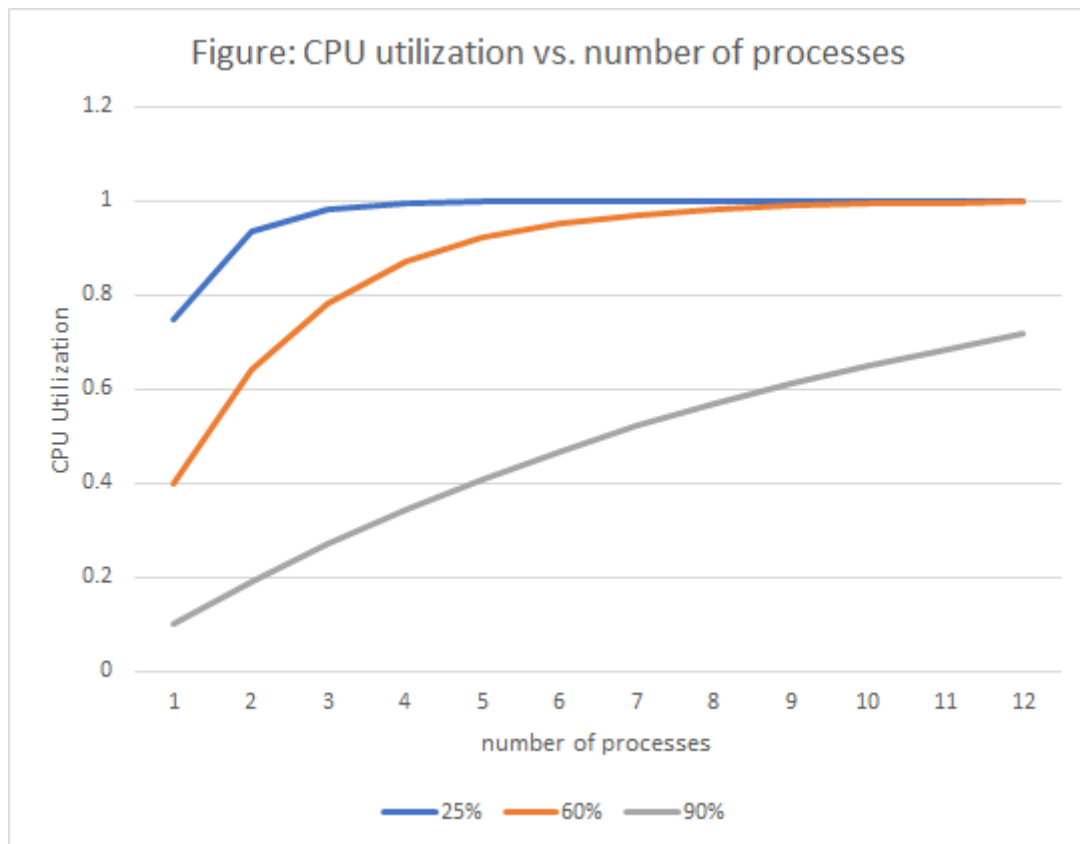
Multiprogramming

1.1

Probability: p^n

CPU utilization: $1 - p^n$

1.2



1.3

a) **Three**.

b) By the equation deduced in 1.1, the CPU utilization is **0.271**.

c)

- adding 256MB: the CPU utilization is **0.570**. Increase: 0.117%/MB
- adding 512MB: the CPU utilization is **0.771**. Increase: 0.098%/MB
- adding 1024MB: the CPU utilization is **0.920**. Increase: 0.063%/MB

By comparison of the calculation result, we see that adding another **256MB** will be the best investment.

Minix 3 Keymap¹

in `/usr/src/servers/is/dmp.c`, struct `hook_entry`, instant hooks, added: ²

```
1 {SF7, proccnt_dmp, "Running process conut"},
```

in `/usr/src/servers/is/dmp_kernel.c`, added: ³

```
1 #include "../pm/mproc.h"
2
3 /* proccnt_dmp */
4 void proccnt_dmp(){
5     struct mproc *pc;
6     int cnt;
7     if (getsysinfo(PM_PROC_NR, SI_PROC_TAB, mproc, sizeof(mproc)) != OK){
8         printf("Get Process Count Error.\n");
9         return;
10    }
11    int i;
12    for(i=0;i<NR_PROCS;i++){ // mproc[NR_PROCS]
13        pc=&mproc[i];
14        if(pc->mp_pid==0 && i!=PM_PROC_NR) continue; // signaled by PM,
        ignore
15        cnt++;
16    }
17    printf("Current number of running processes: %d\n",cnt);
18 }
```

in `/usr/src/servers/is/proto.h`, added:

```
1 void proccnt_dmp(void);
```

```
1 cd /usr/src
2 make build
3 reboot
```

Recompile test result:

```

ptyfsoldnodes check:
    ptyfs is not in use
postinstall checks passed: fontconfig motd mtree wscons x11 xkb varrwho tcpdumpc
hroot catpages obsolete ptyfsoldnodes
postinstall checks failed: bluetooth ddbonpanic defaults dhcpd envsys gid gpio
hosts iscsi makedev named pam periodic pf pwd_mkdb rc ssh uid atf
To fix, run:
    /bin/sh /usr/src/usr.sbin/postinstall/postinstall -s '/usr/src' -d / fix blu
etooth ddbonpanic defaults dhcpd envsys gid gpio hosts iscsi makedev named pam
periodic pf pwd_mkdb rc ssh uid atf
Note that this may overwrite local changes.
=====
do-obsolete ==> .
install-obsolete-lists ==> etc
    install /var/db/obsolete/minix
install-etc-release ==> etc
    create etc/etc-release
hostname: not found
    install etc/release
do-hdboot ==> releasetools
git: not found
Done.
Build started at: Sat Oct 3 00:01:03 GMT 2020
Build finished at: Sat Oct 3 00:25:47 GMT 2020

```

```

# Function key mappings for debug dumps in IS server.

```

Key	Description

F1.	Kernel process table
F3.	System image
F4.	Process privileges
F5.	Boot monitor parameters
F6.	IRQ hooks and policies
F7.	Kernel messages
F8.	VM status and process maps
F10.	Kernel parameters
Shift+F1.	Process manager process table
Shift+F2.	Signals
Shift+F3.	Filesystem process table
Shift+F4.	Device/Driver mapping
Shift+F5.	Print key mappings
Shift+F6.	Reincarnation server process table
Shift+F7.	Running process count
Shift+F8.	Data store contents
Shift+F9.	Processes with stack traces

```

# Current number of running processes: 37

```

```

#

```

1. skr, "F4 function key in minix 3.1.3," *Stack Overflow*, 29-Jan-2016. [Online]. Available: <https://stackoverflow.com/questions/35092125/f4-function-key-in-minix-3-1-3>. [Accessed: 03-Oct-2020]. ↵

2. "How to Use the vi Editor," *Washington.edu*, 2020. [Online]. Available: <https://www.washington.edu/computing/unix/vi.html#:~:text=vi%20can%20be%20used%20from,shows%2024%20lines%20of%20text>. [Accessed: 03-Oct-2020]. ↵

3. A. Jerrett, "Number of Running Processes on a Minix system from C code," *Stack Overflow*, 29-Aug-2011. [Online].

Available: <https://stackoverflow.com/questions/7234369/number-of-running-processes-on-a-minix-system-from-c-code>.

[Accessed: 03-Oct-2020]. ↵