

Experiment – 7

Write a CPU bound C program and a I/O bound C program and observe the effect of their CPU share using the top command and its variants

For CPU Bound:

```
#include<stdio.h>
#include<time.h>
void main()
{
    clock_t start, end;
    double runTime;
    start = clock();
    int i, num=1, primes=0;
    while(num<=10000000)
    {
        i=2;
        while(i<=num){
            if(num%i==0)
                break;
            i++;
        }
        if(i==num)
            primes++;
    }
```

```
printf("%d Primes Numbers Calculated\n",primes);
num++;
}
end=clock();
}
```

```
student@student-virtual-machine: ~  
top - 12:06:50 up 11 min, 1 user, load average: 1.16, 0.68, 0.43  
Tasks: 291 total, 1 running, 290 sleeping, 0 stopped, 0 zombie  
%Cpu(s): 0.7 us, 1.5 sy, 0.5 ni, 97.1 id, 0.0 wa, 0.0 hi, 0.2 si, 0.0 st  
MiB Mem : 1941.6 total, 64.3 free, 1206.9 used, 670.5 buff/cache  
MiB Swap: 2140.0 total, 2056.4 free, 83.6 used, 562.3 avail Mem
```

	PID	USER	PR	NI	VIRT	RES	SHR	S	%CPU	%MEM	TIME+	COMMAND
	1887	student	20	0	4076628	183284	67656	S	3.3	9.2	0:26.18	gnome-s-
	3543	_apt	25	5	33368	8848	7836	S	2.3	0.4	0:13.02	http
	3447	student	30	10	781648	185872	97104	S	1.0	9.3	0:14.40	update+
	2583	student	20	0	572196	49312	36732	S	0.7	2.5	0:12.37	gnome-t+
	3804	student	20	0	21868	4084	3224	R	0.7	0.2	0:00.18	top
	23	root	20	0	0	0	0	I	0.3	0.0	0:00.64	kworker+
	285	root	20	0	0	0	0	I	0.3	0.0	0:01.94	kworker+
	587	systemd+	20	0	14824	5924	5124	S	0.3	0.3	0:01.70	systemd+
	889	message+	20	0	11060	5812	3728	S	0.3	0.3	0:02.07	dbus-da+
	1720	student	20	0	9824	5184	3584	S	0.3	0.3	0:01.01	dbus-da+
	2223	student	20	0	304832	37408	21360	S	0.3	1.9	0:01.46	vntoolsd
	2312	student	20	0	210048	39580	16976	S	0.3	2.0	0:00.37	Xwayland
	2456	student	20	0	2803412	49476	33832	S	0.3	2.5	0:01.03	gjs
	3490	root	25	5	213496	105012	66608	S	0.3	5.3	0:02.80	aptd
	1	root	20	0	167928	12760	7744	S	0.0	0.6	0:03.73	systemd
	2	root	20	0	0	0	0	S	0.0	0.0	0:00.02	kthreadd
	3	root	0	-20	0	0	0	I	0.0	0.0	0:00.00	rcu_gp

```
student@student-virtual-machine:~$
```

For I/O Bound:

```
#include<stdio.h>

#include<time.h>

int main()

{

int j,k,n;

while(1){

printf("Enter any number: ");
```

```

scanf("%d",&k);

printf("\n Enter any number: ");

scanf("%d",&j);

n=k%j;

printf("%d",n);

time_t rawtime;

struct tm * timeinfo;

time(&rawtime);

timeinfo=localtime(&rawtime);

printf("\n Current local time and date: %s",asctime(timeinfo));

}

}

```

```

es Terminal Dec 8 12:15
student@student-virtual-mach...
^C
student@student-virtual-machine:~$ ./test2
Enter any number: 3

Enter any number: 4
3
Current local time and date: Thu Dec 8 12:13:48 2022
Enter any number: 5

Enter any number: 7
5
Current local time and date: Thu Dec 8 12:13:53 2022
Enter any number: 3

Enter any number: 9
3
Current local time and date: Thu Dec 8 12:14:36 2022
Enter any number: 

```

```

student@student-virtual-machine:~$ top
top - 12:15:42 up 20 min, 1 user, load average: 0.28, 0.28, 0.32
Tasks: 294 total, 2 running, 292 sleeping, 0 stopped, 0 zombie
%Cpu(s): 3.4 us, 2.9 sy, 0.7 ni, 92.6 id, 0.0 wa, 0.0 hi, 0.3 si, 0.0 st
MiB Mem : 1941.6 total, 64.5 free, 1186.5 used, 690.6 buff/cache
MiB Swap: 2140.0 total, 2038.3 free, 101.7 used. 581.4 avail Mem

  PID USER      PR  NI    VIRT    RES    SHR S  %CPU  %MEM    TIME+  COMMAND
1887 student    20   0 4088412 170796 59776 S   8.5   8.6   0:45.70 gnome-+
2583 student    20   0 572332 48304 35488 S   2.6   2.4   0:17.66 gnome-+
3543 _apt      25   5 33368 8792 7780 S   2.0   0.4   0:25.95 http
2456 student    20   0 2803412 49532 33880 S   1.0   2.5   0:01.37 gjs
3447 student    30  10 781648 171760 82992 S   1.0   8.6   0:20.97 update+
587 systemd+  20   0 14824 5924 5124 S   0.3   0.3   0:03.07 system+
889 message+  20   0 11060 5764 3716 S   0.3   0.3   0:02.97 dbus-d+
2081 student    20   0 323536 10204 6700 S   0.3   0.5   0:07.24 ibus-d+
2130 student    20   0 356452 24856 14288 S   0.3   1.3   0:02.17 ibus-e+
3808 root        20   0 0 0 0 I   0.3   0.0   0:00.99 kworke+
3907 student    20   0 21868 4180 3316 R   0.3   0.2   0:00.90 top
1 root        20   0 167928 12748 7732 S   0.0   0.6   0:03.76 systemd
2 root        20   0 0 0 0 S   0.0   0.0   0:00.02 kthrea+
3 root        0 -20 0 0 0 I   0.0   0.0   0:00.00 rcu_gp
4 root        0 -20 0 0 0 I   0.0   0.0   0:00.00 rcu_pa+

```