



EXPERIMENT 7

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CSE SEM 3

OPERATING SYSTEM (COM-312)

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 it's variant

(A) For CPU Bound:-

```
#include<stdio.h>
#include<time.h>
void main(){
clock_tr start, end;
double runtime;
start = clock();
int I, num=1, prime=0;
while(num<=100000000){
i=2;
while(i<=num){
if(num%i==0)
break;
i++;
}
If(i==num)
prime++;
printf("%d prime numbers calculated\n",prime);
```

```
n++;}  
end = clock();  
}
```

```
#include<stdio.h>  
#include<time.h>  
  
int main()  
{  
    int j,k,n;  
    while(1){  
  
        printf("\nEnter the any number:");  
        scanf("%d",&k);  
        printf("Enter the 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));  
    }  
}
```

```
vanshak@HP-laptop:/mnt/d$ nano exp7a.c  
vanshak@HP-laptop:/mnt/d$ gcc exp7a.c  
vanshak@HP-laptop:/mnt/d$ ./a.out  
  
Enter the any number:67  
Enter the any number:87  
67  
Current local time and date:Fri Dec 9 17:52:36 2022  
  
Enter the any number:787  
Enter the any number:89  
75  
Current local time and date:Fri Dec 9 17:52:40 2022
```

```
top - 17:52:48 up 40 min, 0 users, load average: 0.52, 0.58, 0.59
Tasks: 7 total, 1 running, 6 sleeping, 0 stopped, 0 zombie
%Cpu(s): 1.1 us, 2.1 sy, 0.0 ni, 96.0 id, 0.0 wa, 0.7 hi, 0.0 si, 0.0 st
MiB Mem : 12179.4 total, 7534.9 free, 4420.5 used, 224.0 buff/cache
MiB Swap: 26380.9 total, 26378.6 free, 2.2 used, 7628.3 avail Mem
```

PID	USER	PR	NI	VIRT	RES	SHR	S	%CPU	%MEM	TIME+	COMMAND
70	vanhak	20	0	10812	768	616	S	1.0	0.0	0:00.06	a.out
1	root	20	0	8960	416	340	S	0.0	0.0	0:00.08	init
10	root	20	0	9312	232	184	S	0.0	0.0	0:00.00	init
11	vanhak	20	0	17268	3820	3728	S	0.0	0.0	0:00.41	bash
47	root	20	0	9312	236	188	S	0.0	0.0	0:00.00	init
48	vanhak	20	0	17268	3848	3760	S	0.0	0.0	0:00.23	bash
64	vanhak	20	0	18828	2320	1588	R	0.0	0.0	0:00.01	top

(B) For I/O Bound:-

```
#include<stdio.h>

#include<time.h>

int mani(){
int j, k, n;
while(1){
printf("Enter any number:");
scanf("%d",&j);
printf("Enter any number:");
scanf("%d",&k);
n=j%k;
printf("remainder: %d",n);
time_t rawtime;
struct tm* timeinfo;
time(&rawtime);
timeinfo= localtime(&rawtime);
```

```
printf("\nCurrent local time and date=
%s",asctime(timeinfo));

}
```

```
return 0;
```

```
#include<stdio.h>
#include<time.h>

void main() {
    clock_t start, end;
    double runTime;
    start=clock();
    int i,num=1,primes=0;

    while(num<=1000000){
        i=2;
        while(i<=num){
            if(num%i==0)
                break;
            i++;
        }
        if(i==num)
            primes++;
        num++;
    }

    end=clock();
    runTime=(end-start)/(double) CLOCKS_PER_SEC;
    printf("This machine calculated all %d primes numbers under 1000000 in %g seconds\n",primes,runTime);
}
```

```
78498 prime numbers calculated
78498 prime numbers calculated
78498 prime numbers calculated
78498 prime numbers calculated
78498 prime numbers calculated
This machine calculated all 78498 primes numbers under 1000000 in 211.75 seconds
```

```
top - 18:01:40 up 49 min,  0 users,  load average: 0.52, 0.58, 0.59
Tasks:  7 total,   1 running,  6 sleeping,   0 stopped,   0 zombie
%Cpu(s): 11.2 us, 34.3 sy,  0.0 ni, 45.9 id,  0.0 wa,  8.7 hi,  0.0 si,  0.0 st
MiB Mem : 12179.4 total,  7559.7 free,  4395.8 used,  224.0 buff/cache
MiB Swap: 26380.9 total, 26337.3 free,   43.6 used.  7653.0 avail Mem
```

PID	USER	PR	NI	VIRT	RES	SHR	S	%CPU	%MEM	TIME+	COMMAND
80	vanshak	20	0	10812	648	504	S	67.0	0.0	0:05.50	a.out
1	root	20	0	8960	416	340	S	0.0	0.0	0:00.08	init
10	root	20	0	9312	232	184	S	0.0	0.0	0:00.00	init
11	vanshak	20	0	17268	3824	3732	S	0.0	0.0	0:00.46	bash
47	root	20	0	9312	236	188	S	0.0	0.0	0:00.00	init
48	vanshak	20	0	17268	3848	3760	S	0.0	0.0	0:00.23	bash
64	vanshak	20	0	18828	2320	1588	R	0.0	0.0	0:00.19	top