<u>EXPERIMENT 7</u>:- Write a CPU bound C program and a I/O bound C program and observe the effect of their CPU sharing using the top command and its variants.

❖ <u>CPU BOUND</u>

```c
#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++;

 printf("%d prime numbers     calculated\n",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);

}
```

OUTPUT


```
#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++;

printf("%d prime numbers calculated\n",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
```

❖ I/O BOUND

```
#include<stdio.h>

#include<time.h>

int main()

{

int j,k,n;

while(1){

printf("\nEnter the any
```

```c
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));
}
}
```

OUTPUT


```c
#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 vanshak   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 vanshak   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 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   0:00.01 top
```