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 variants.

(a) For CPU bound: -

Syntax:

```
#include<stdio.h>
#include<time.h>
void main(){
clock_tr start, end;
double runtime;
start = clock();
int I, num=1, prime=0;
while(num<=10000000){
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();
}
```

E.g. : Ex_7a.1, Ex_7a.2, Ex_7a.3.

(b) For i/o bound: -

Syntax: -

```
#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;
}
```

```
top - 11:33:14 up 12 min,  1 user,  load average: 0.36, 0.24, 0.19
Tasks: 176 total,   1 running, 175 sleeping,   0 stopped,   0 zombie
%Cpu(s):  4.1 us,  2.0 sy,  0.0 ni, 93.9 id,  0.0 wa,  0.0 hi,  0.0 si,  0.0 st
MiB Mem :   3894.8 total,   2629.7 free,    809.1 used,    456.1 buff/cache
MiB Swap:    975.0 total,    975.0 free,      0.0 used.   2842.2 avail Mem

    PID USER      PR  NI    VIRT    RES    SHR S  %CPU  %MEM     TIME+ COMMAND
   1007 aakash    20   0  261972  19448  15248 S   0.0   0.5   0:00.04 xfce4-notifyd
   1010 aakash    20   0  236896  10672   7584 S   0.0   0.3   0:00.07 xiccd
   1017 aakash    20   0  266720  25460  16424 S   0.0   0.6   0:00.12 light-locker
   1034 aakash    20   0  188140  19868  15516 S   0.0   0.5   0:00.09 xfce4-power-man
   1037 aakash    20   0   14764   3960   1540 S   0.0   0.1   0:00.02 xcape
   1040 colord    20   0  243520  17468   9676 S   0.0   0.4   0:00.22 colord
   1045 aakash    20   0  157468   4356   3988 S   0.0   0.1   0:00.00 dconf-service
   1117 aakash    20   0  351768  13884  10368 S   0.0   0.3   0:00.05 gvfs-udisks2-vo
   1121 root      20   0  395828  15076  10792 S   0.0   0.4   0:00.10 udisksd
   1140 aakash    20   0  234580   8076   5492 S   0.0   0.2   0:00.01 gvfs-goa-volume
   1147 aakash    20   0  235368   8908   6152 S   0.0   0.2   0:00.01 gvfs-gphoto2-vo
   1151 aakash    20   0   48024   7012   6272 S   0.0   0.2   0:00.03 obexd
   1152 aakash    20   0  234416   8584   5948 S   0.0   0.2   0:00.01 gvfs-mtp-volume
   1160 aakash    20   0  313468  10248   7152 S   0.0   0.3   0:00.07 gvfs-afc-volume
   1168 aakash    20   0  312720  10580   7496 S   0.0   0.3   0:00.07 gvfsd-trash
   1173 aakash    20   0  160860   5852   5348 S   0.0   0.1   0:00.01 gvfsd-metadata
   3317 root      20   0       0      0      0 I   0.0   0.0   0:00.11 kworker/0:0-events
   3330 root      20   0       0      0      0 I   0.0   0.0   0:00.01 kworker/u256:1-events_unbound
   3446 aakash    20   0  438172 108568  89512 S   0.0   2.7   0:00.39 qterminal
   3449 aakash    20   0   10620   6416   4264 S   0.0   0.2   0:00.24 zsh
   3477 aakash    20   0   10620   6500   4344 S   0.0   0.2   0:00.13 zsh
   3490 aakash    20   0  438076 108516  89448 S   0.0   2.7   0:00.19 qterminal
   3493 aakash    20   0   10604   6256   4124 S   0.0   0.2   0:00.07 zsh
   3809 aakash    39  19  409556  20336  13992 S   0.0   0.5   0:00.08 tumblerd
   3841 aakash    20   0    2424    732    648 S   0.0   0.0   0:00.00 a.out
```

```
└─$ cd Desktop

┌──(aakash㉿kali)-[~/Desktop]
└─$ gcc exp7.c

┌──(aakash㉿kali)-[~/Desktop]
└─$ ./a.out

Enter any number:76
Enter any number:5858
76
Current local time and date: Sun Dec 18 11:32:36 2022

Enter any number:68
Enter any number:96
68
Current local time and date: Sun Dec 18 11:32:38 2022

Enter any number:96
Enter any number:96
0
Current local time and date: Sun Dec 18 11:32:39 2022
```

```
┌──(aakash㉿kali)-[~/Desktop]
└─$ gcc exp7a.c

┌──(aakash㉿kali)-[~/Desktop]
└─$ ./a.out
0 prime numbers calculation
1 prime numbers calculation
2 prime numbers calculation
2 prime numbers calculation
3 prime numbers calculation
3 prime numbers calculation
4 prime numbers calculation
4 prime numbers calculation
4 prime numbers calculation
4 prime numbers calculation
5 prime numbers calculation
5 prime numbers calculation
6 prime numbers calculation
6 prime numbers calculation
6 prime numbers calculation
```