आत्मा राम सनातन धर्म महाविद्यालय
Atma Ram Sanatan Dharma College
University of Delhi

Atma Ram Sanatan Dharma College
University Of Delhi

Name	Neeraj
Roll no.	18088
Course	Bsc(H)Computer Science
Submitted to	**Dr. Parul Jain**

Q2 Write a program to report behavior of Linux kernel including kernel version, CPU type and model. (CPU information)

Ans

```c
#include <stdio.h>
#include <stdlib.h>
#include <unistd.h>

int main()
{
    printf("\n Kernel version is : \n");
    system("cat /proc/sys/kernel/osrelease\n");
    printf("\n CPU information is: \n");
    system("cat /proc/cpuinfo\n");
```

```
        return 0;
}
```

Output:-

```
gautam@gautam:~/Desktop/os$ gcc -o a program4.c
gautam@gautam:~/Desktop/os$ ./a

 Kernel version is :
5.15.0-47-generic

 CPU information is:
processor       : 0
vendor_id       : GenuineIntel
cpu family      : 6
model           : 42
model name      : Intel(R) Core(TM) i3-2330M CPU @ 2.20GHz
stepping        : 7
cpu MHz         : 2195.018
cache size      : 3072 KB
physical id     : 0
siblings        : 2
core id         : 0
cpu cores       : 2
apicid          : 0
initial apicid  : 0
fpu             : yes
fpu_exception   : yes
cpuid level     : 13
wp              : yes
flags           : fpu vme de pse tsc msr pae mce cx8 apic sep mtrr pge mca cmov pat pse36 clflush mmx fxsr sse sse2 ht syscall nx rdtscp lm constant_
tsc rep_good nopl xtopology nonstop_tsc cpuid tsc_known_freq pni pclmulqdq ssse3 cx16 sse4_1 sse4_2 x2apic popcnt xsave avx hypervisor lahf_lm pti md
_clear flush_l1d
bugs            : cpu_meltdown spectre_v1 spectre_v2 spec_store_bypass l1tf mds swapgs itlb_multihit
bogomips        : 4390.03
clflush size    : 64
cache_alignment : 64
address sizes   : 36 bits physical, 48 bits virtual
power management:

processor       : 1
vendor_id       : GenuineIntel
cpu family      : 6
model           : 42
model name      : Intel(R) Core(TM) i3-2330M CPU @ 2.20GHz
stepping        : 7
cpu MHz         : 2195.018
cache size      : 3072 KB
physical id     : 0
siblings        : 2
core id         : 1
cpu cores       : 2
apicid          : 1
initial apicid  : 1
fpu             : yes
fpu_exception   : yes
cpuid level     : 13
wp              : yes
flags           : fpu vme de pse tsc msr pae mce cx8 apic sep mtrr pge mca cmov pat pse36 clflush mmx fxsr sse sse2 ht syscall nx rdtscp lm constant_
tsc rep_good nopl xtopology nonstop_tsc cpuid tsc_known_freq pni pclmulqdq ssse3 cx16 sse4_1 sse4_2 x2apic popcnt xsave avx hypervisor lahf_lm pti md
_clear flush_l1d
bugs            : cpu_meltdown spectre_v1 spectre_v2 spec_store_bypass l1tf mds swapgs itlb_multihit
bogomips        : 4390.03
clflush size    : 64
cache_alignment : 64
address sizes   : 36 bits physical, 48 bits virtual
power management:

gautam@gautam:~/Desktop/os$ ▯
```

Q3 Write a program to report behavior of Linux kernel including on
19 configured memory, amount of free and used memory.(memory
information)

Ans

```
#include <stdio.h>
#include <stdlib.h>
#include <unistd.h>
```

```c
int main()
{
    printf("\n Kernel version: \n");
    system("cat /proc/sys/kernel/osrelease\n");
    printf("\n Configured free and used memory: \n");
    system("cat /proc/meminfo | awk 'NR == 1, NR == 2 {print}'");
    return 0;
}
```

Output:-

```
gautam@gautam:~/Desktop/os$ gcc -o a program5.c
gautam@gautam:~/Desktop/os$ ./a

 Kernel version:
5.15.0-47-generic

 Configured free and used memory:
MemTotal:        2781416 kB
MemFree:           81584 kB
gautam@gautam:~/Desktop/os$ 
```

Q4 Write a program to print a file detail including owner access permission, file access time, where file name is given as argument.

Ans

```c
#include <stdio.h>
#include <sys/stat.h>
#include <time.h>
#include <unistd.h>

int main(int argc, char *argv[10])
{
    int i;
    struct stat buffer;
    struct tm dt;
    printf("Give file name: ");
    for (i = 1; i < argc; i++)
    {
        printf("file = %s\n", argv[i]);
```

```c
        if (stat(argv[1], &buffer) < 0)
            printf("Error in file name");
        else
        {
            printf("Owner: %d\ngid = %d\n", buffer.st_uid, buffer.st_gid);
            printf("Access permission = %d\n", buffer.st_mode);
            dt = *(gmtime(&buffer.st_ctime));
            printf("Access time = %d-%d-%d %d:%d:%d\n", dt.tm_mday, dt.tm_mon,
dt.tm_year + 1900, dt.tm_hour, dt.tm_min, dt.tm_sec);
        }
    }
    return 0;
}
```

Output:-

```
gautam@gautam:~/Desktop/os$ gcc -o a program6.c
gautam@gautam:~/Desktop/os$ ls
a   program1.c   program2.c   program3.c   program4.c   program5.c   program6.c
gautam@gautam:~/Desktop/os$ ./a program1.c
Give file name: file = program1.c
Owner: 1000
gid = 1000
Access permission = 33204
Access time = 2-8-2022 13:34:26
gautam@gautam:~/Desktop/os$ 
```