

```
deepank@iitd-System-Product-Name: ~/Vanshaj/OOPD-Project-main
deepank@iitd-System-Product-Name:~/Vanshaj/OOPD-Project-main$ ./profile.sh

real    1m53.637s
user    0m1.240s
sys     1m6.148s

real    3m31.451s
user    0m2.521s
sys     1m30.715s

real    7m31.971s
user    0m4.064s
sys     2m13.694s
deepank@iitd-System-Product-Name:~/Vanshaj/OOPD-Project-main$
```

Result for profiling without thread implementation. The first time command output is for (1), the second is for (2), and the third is for (3).

```
deepank@iitd-System-Product-Name: ~/Vanshaj/OOPD-Project-multi-thread
deepank@iitd-System-Product-Name:~/Vanshaj/OOPD-Project-multi-thread$ ./profile.sh

real    3m39.429s
user    0m3.268s
sys     2m56.181s

real    4m8.437s
user    0m2.366s
sys     1m23.970s

real    3m32.918s
user    0m3.830s
sys     2m24.852s
deepank@iitd-System-Product-Name:~/Vanshaj/OOPD-Project-multi-thread$
```

Result for profiling with thread implementation. We can see that for the directory structure (1) and (2), the difference in time taken is not much since we are only working with files; however, we see that in the directory structure (3), there is an almost 50% reduction in time due to the nested directories where each thread can work.

```
Nov 28 18:01
deepank@iitd-System-Product-Name: ~/work/network_path_finder$
[1] 630480
deepank@iitd-System-Product-Name:~/work/network_path_finder$ g cmd
[1]+ Done xdg-open .
deepank@iitd-System-Product-Name:~/work/network_path_finder$ lscpu
Architecture: x86_64
CPU op-mode(s): 32-bit, 64-bit
Byte Order: Little Endian
Address sizes: 46 bits physical, 48 bits virtual
CPU(s): 20
On-line CPU(s) list: 0-19
Thread(s) per core: 1
Core(s) per socket: 12
Socket(s): 1
NUMA node(s): 1
Vendor ID: GenuineIntel
CPU family: 6
Model: 151
Model name: 12th Gen Intel(R) Core(TM) i7-12700
Stepping: 2
CPU MHz: 2100.000
CPU max MHz: 4900.0000
CPU min MHz: 800.0000
BogoMIPS: 4224.00
Virtualization: VT-x
L1d cache: 288 KiB
L1i cache: 192 KiB
L2 cache: 7.5 MiB
NUMA node0 CPU(s): 0-19
Vulnerability Itlb multihit: Not affected
Vulnerability L1tf: Not affected
Vulnerability Mds: Not affected
Vulnerability Meltdown: Not affected
Vulnerability Mmio stale data: Not affected
Vulnerability Retbleed: Not affected
Vulnerability Spec store bypass: Mitigation; Speculative Store Bypass disabled via prctl
Vulnerability Spectre v1: Mitigation; usercopy/swapgs barriers and __user pointer
Vulnerability Spectre v2: Mitigation; Enhanced IBRS, IBPB conditional, RSB filling
Vulnerability Srbds: Not affected
Vulnerability Tsx async abort: Not affected
Flags: fpu vme de pse tsc msr pae mce cx8 apic sep mtrr pge mca
e36 clflush dts acpi mmx fxsr sse sse2 ss ht tm pbe sys
gb rdtscp lm constant_tsc art arch_perfmon pebs bts rep
opology nonstop_tsc cpuid aperfmperf tsc_known_freq pni
es64 monitor ds_cpl vmx smx est tm2 ssse3 sdbg fma cx16
e4_1 sse4_2 x2apic movbe popcnt tsc_deadline_timer aes
c rdrand lahf_lm abm 3dnowprefetch cpuid_fault epb ssbd
ibp ibrs_enhanced tpr_shadow vnmi flexpriority ept vpid
ase tsc_adjust bmi1 avx2 smep bmi2 erms invpcid rdseed
ushopt clwb intel_pt sha_ni xsaveopt xsavec xgetbv1 xsa
k_detect avx_vnni dtherm ida arat pln pts hwp hwp_notif
dow hwp_epp hwp_pkg_req umip pku ospke waitpkg gfni vaes
tme rdpid movdiri movdir64b fsrm md_clear serialize pcor
flush_l1d arch_capabilities
deepank@iitd-System-Product-Name:~/work/network_path_finder$
```

Here is the hardware configuration of the PC that we used.