Riphah International University Islamabad

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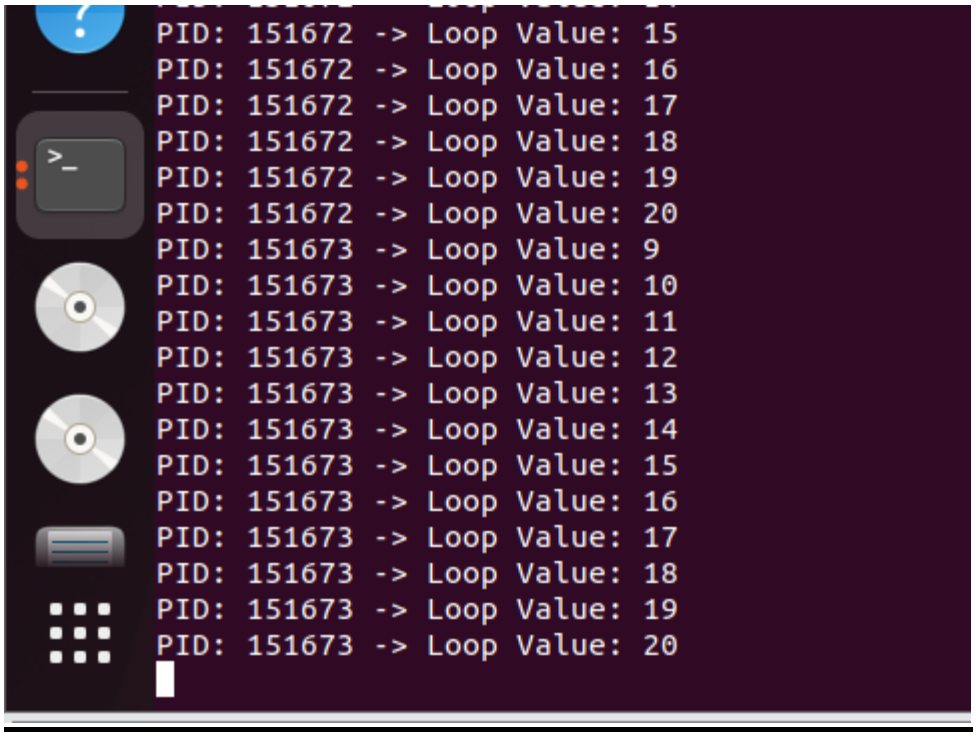
Operating System

OS Lab # 08

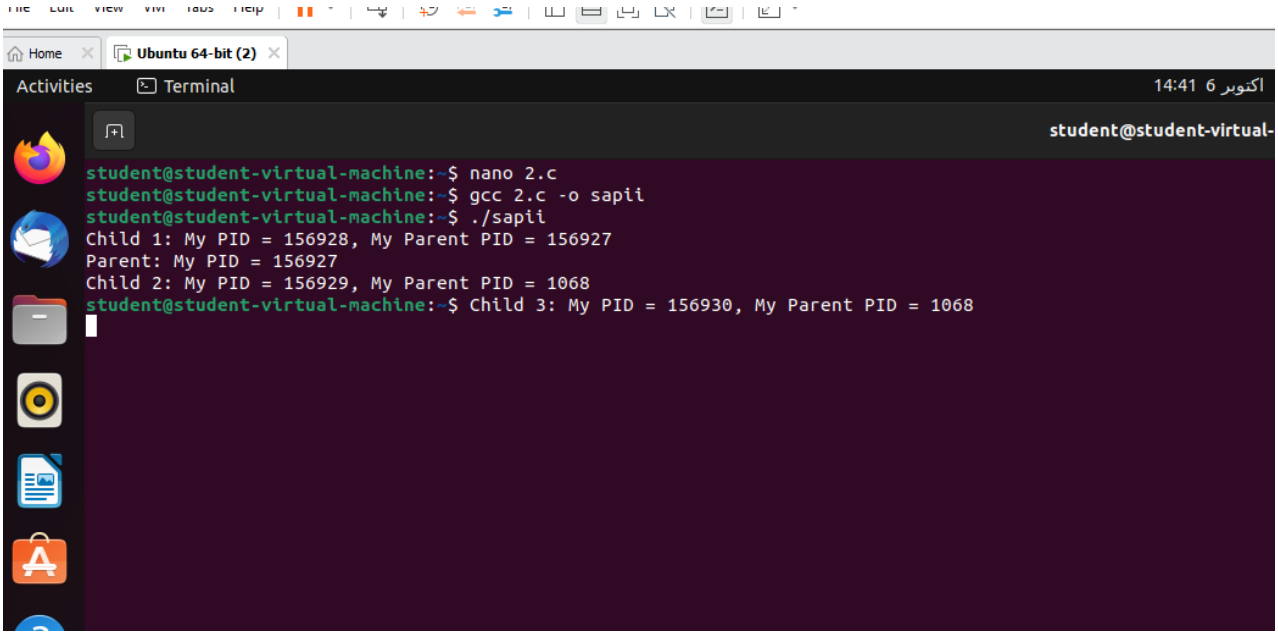
Task # 01

```
student@student-virtual-machine:~$ nano 1.c
student@student-virtual-machine:~$ gcc 1.c -o progii
student@student-virtual-machine:~$ ./progii
PID: 151671 -> Loop Value: 1
PID: 151672 -> Loop Value: 1
PID: 151671 -> Loop Value: 2
PID: 151672 -> Loop Value: 2
PID: 151674 -> Loop Value: 1
PID: 151674 -> Loop Value: 2
PID: 151674 -> Loop Value: 3
PID: 151673 -> Loop Value: 1
PID: 151673 -> Loop Value: 2
PID: 151672 -> Loop Value: 3
PID: 151672 -> Loop Value: 4
PID: 151674 -> Loop Value: 4
PID: 151674 -> Loop Value: 5
PID: 151671 -> Loop Value: 3
PID: 151671 -> Loop Value: 4
PID: 151674 -> Loop Value: 6
PID: 151671 -> Loop Value: 5
PID: 151674 -> Loop Value: 7
PID: 151671 -> Loop Value: 6
PID: 151674 -> Loop Value: 8
PID: 151671 -> Loop Value: 7
PID: 151674 -> Loop Value: 9
PID: 151671 -> Loop Value: 8
```

```
PID: 151671 -> Loop Value: 8
PID: 151674 -> Loop Value: 10
PID: 151671 -> Loop Value: 9
PID: 151674 -> Loop Value: 11
PID: 151671 -> Loop Value: 10
PID: 151674 -> Loop Value: 12
PID: 151671 -> Loop Value: 11
PID: 151674 -> Loop Value: 13
PID: 151671 -> Loop Value: 12
PID: 151674 -> Loop Value: 14
PID: 151671 -> Loop Value: 13
PID: 151674 -> Loop Value: 15
PID: 151671 -> Loop Value: 14
PID: 151674 -> Loop Value: 16
PID: 151671 -> Loop Value: 15
PID: 151674 -> Loop Value: 17
PID: 151671 -> Loop Value: 16
PID: 151674 -> Loop Value: 18
PID: 151671 -> Loop Value: 17
PID: 151674 -> Loop Value: 19
PID: 151674 -> Loop Value: 20
PID: 151671 -> Loop Value: 18
PID: 151671 -> Loop Value: 19
PID: 151671 -> Loop Value: 20
student@student-virtual-machine:~$ PID: 151673 -> Loop Value: 3
PID: 151672 -> Loop Value: 5
PID: 151673 -> Loop Value: 4
PID: 151672 -> Loop Value: 6
PID: 151672 -> Loop Value: 7
PID: 151672 -> Loop Value: 8
PID: 151673 -> Loop Value: 5
PID: 151673 -> Loop Value: 6
PID: 151673 -> Loop Value: 7
PID: 151673 -> Loop Value: 8
PID: 151672 -> Loop Value: 9
PID: 151672 -> Loop Value: 10
PID: 151672 -> Loop Value: 11
PID: 151672 -> Loop Value: 12
PID: 151672 -> Loop Value: 13
PID: 151672 -> Loop Value: 14
PID: 151672 -> Loop Value: 15
```



Task # 02



Task # 03

System Calls:

A system call is a way for a program to ask the operating system (kernel) for a service.Programs themselves cannot directly access hardware (like CPU, disk, network), so they use system calls to request help from the OS.

Example:

When you open a file, the program itself cannot open the disk; it asks the kernel through a system call like open().

Process Control:

It is used to create, manage, and end processes.

Examples:

fork(): creates a new process.

exec() : replaces a process with a new program.

wait(): makes a parent wait until child finishes.

exit() : ends a process.

File Management (File I/O):

It is used for reading/writing and managing files.

Examples:

open() : open a file.

read(): read from a file.

write(): write to a file.

close(): close a file.

Signal Handling System Calls:

Signals are like software interrupts that notify a process that some event has happened (for example, pressing Ctrl+C, timer expiry, or another process sending a signal).System calls help processes send, receive, and handle signals.

kill():

Used to send a signal to a process (despite the name, it can send many signals, not just “kill”).

alarm():

Used to set a timer (in seconds).When the time expires, the process receives a SIGALRM signal.

signal():

Used to define how a process should react when a signal arrives.

<u>Process Management System Calls:</u>

These system calls are used to create, identify, and manage processes in the operating system.

getppid():

- Returns the Parent Process ID (PPID) of the calling process.

getuid():

- Returns the User ID (UID) of the process owner.
- UID identifies which user started the process.

getgid():

- Returns the Group ID (GID) of the process owner.
- GID identifies the group the user belongs to.