Lab 8 – Process Management in Linux

1. Process Status

Command:

```
ps aux
```

Explanation:

- a → show processes for all users
- u → show user/owner of process
- x → show processes not attached to a terminal

2. Process Tree

Command:

```
pstree -p
```

Shows parent-child process relationships.

3. Real-Time Monitoring

Command:

```
top
```

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4. Adjust Process Priority

Start a process with low priority:

```
nice -n 10 sleep 300 &
```

OUTPUT: Note the **PID** (e.g., x) for subsequent steps.

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5. Change Priority of a Running Process

Command:

```
renice 5 -p x
```

(Replace x with the actual PID)

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6. I/O Scheduling Priority

Command:

```
ionice -c 3 -p x
```

(Replace x with the actual PID)

OUTPUT:

```
successfully set pid x's IO scheduling class to idle
```

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7. File Descriptors Used by a Process

Command:

```
lsof -p x | head -5
```

(Replace x with the actual PID)

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8. Monitor Open Files Globally

Command:

```
lsof | less
```

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9. Find Process Using a Port

Command:

```
sudo fuser -n tcp 8080
```

OUTPUT:

```
8080/tcp: 4321
```

(The number is the PID using the port)

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10. Per-Process Statistics

Command:

```
pidstat -p x 2 3
```

(Replace `x` with the actual PID)

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11. Control Groups (cgroups) for Resource Limits

Create a new cgroup:

```
sudo cgcreate -g cpu,memory:/testgroup
```

Limit CPU and Memory:

```
echo 50000 | sudo tee /sys/fs/cgroup/cpu/testgroup/cpu.cfs_quota_us
echo 100M | sudo tee /sys/fs/cgroup/memory/testgroup/memory.limit_in_bytes
```

(Note: `50000` is 50% of one CPU core, and `100M` is 100 Megabytes.)