ANNEX A · PRACTICAL 5.7 · FIND THE BOTTLENECK

Name: _____ **Date:** _____ **Group:** _____

Work in `deb-lab` (tasks 1–8) and `win11` (task 9). Hand in: this sheet, and on Classroom the report `practical-5.7-surname.md` with a table baseline / A / B / C. Marking: baseline: 2 · loads A, B, C: 2 each · task 8: 1 · clear report: 1.

PART A · THE BASELINE: A HEALTHY MACHINE

Close the browser in the VM and wait one minute before you measure.

Task 1 · Tools. `sudo apt install sysstat stress-ng` Then `nproc` → cores: _____

Task 2 · Load. `uptime` → load average: 1 min _____ 5 min _____ 15 min _____ Above the number of cores? _____

Task 3 · Memory. `free -h`, line `Mem:`

total _____ used _____ free _____ buff/cache _____ available _____ Swap used: _____

Task 4 · CPU, disk, network. Run `vmstat 1 5` and copy the **last** line into the row "Baseline" of the big table below. Then:

`df -h /` → `Use%`: _____ free space: _____ `ip -s link` → RX errors: _____ dropped: _____

DONE WHEN the "Baseline" row of the table is full and you know how many cores you have.

PART B · THREE SLOW MACHINES (TRAMUNTANA APPS)

Three people say "my machine is slow". `mystery.sh` reproduces each complaint for 3 minutes. Open **two** terminals: run the load in the first, measure in the second. You can run a load again as often as you need.

```
bash mystery.sh A        # first terminal. Then B, then C.
```

```
uptime ; free -h ; vmstat 1 5        # second terminal. Also: top (keys P and M), iostat -d 1 3
```

	load 1 min	r	b	so	bo	id	wa	available
Baseline								
Load A								
Load B								
Load C								

Task 5 · Load A. Process at the top of `top`: _____ `%CPU`: _____ How many of them? _____

Resource that is the bottleneck: _____ The two numbers that prove it: _____

Task 6 · Load B. In `top` press `M`. Process at the top: _____ `%MEM`: _____

`available` fell from _____ to _____. Is the CPU busy? _____ Bottleneck: _____

Task 7 · Load C. Also run `iostat -d 1 3`. Device: _____ `kB_wrtn/s`: _____ Process in `top`: _____

Bottleneck: _____ Did the load average go up although the CPU was not full? _____ Why?

DONE WHEN each load has a resource and two numbers that differ clearly from your baseline.

Task 8 · What would you tell the boss? One line per machine: what to check or buy — and one thing that would be a waste of money.

A: _____

B: _____

C: _____

PART C · WINDOWS

Task 9 · One busy core. In `win11`: `Ctrl+Shift+Esc` → **Performance**. Write the baseline. Then open PowerShell, type the loop, and look again. Stop it with `Ctrl+C`.

```
while ($true) { }
```

	CPU %	Memory in use	Disk active time %
Baseline			
With the loop			

Process at the top of the **Processes** page (sorted by CPU): _____ Why is the CPU not at 100 %?

_____

In a second PowerShell: `Get-Counter '\Processor(_Total)\% Processor Time'` → _____

DONE WHEN the graph went up with the loop and came back down when you stopped it.

EXIT TICKET (NO VM, ALONE)

1. `uptime` shows `load average: 6.00, 5.80, 5.50` on a machine with 2 cores. What does it mean?

☐ **a)** The CPU is at 6 %
☐ **b)** About four processes are waiting all the time
☐ **c)** Six users are logged in
☐ **d)** The machine has been on for 6 hours

2. `free -h` shows `free 180Mi` and `available 2.4Gi`. Is the machine short of memory?

☐ **a)** Yes: only 180 MiB are left
☐ **b)** Yes: it must be swapping
☐ **c)** No: programs can still get about 2.4 GiB
☐ **d)** You cannot tell from `free`

3. In `vmstat`, what does a high `wa` tell you?

☐ **a)** The CPU is waiting for the disk
☐ **b)** The CPU is busy with programs
☐ **c)** Memory is being swapped
☐ **d)** The network is slow

4. Which `vmstat` columns show that RAM has really run out?

☐ **a)** `us` and `sy` ☐ **b)** `r` and `b` ☐ **c)** `bi` and `bo` ☐ **d)** `si` and `so`

5. A server is slow. `us` is 5, `wa` is 40 for minutes, `available` is large. The boss wants to buy RAM. You say…

☐ **a)** Yes, RAM always helps
☐ **b)** No: the evidence points at the disk
☐ **c)** No: buy a faster CPU
☐ **d)** Reboot it every night