1. Sectors in fdisk
Sectors are the smallest storage units on a disk (usually 512B or 4K). The "sectors" column shows where partitions start/end on disk.

2. Partitioning Recommendations
- Desktop: `/` (20-50GB), `/home` (rest), swap (=RAM size)
- DB/Web Server: `/` (20GB), `/var` (large, for logs), `/data` (for DBs), swap (1.5× RAM if <8GB)
- Lab Server: `/` (20GB), `/home` (large, for users), `/tmp` (separate), swap (1× RAM)

3. Running Apps with Low RAM
- CPU shares time between processes
- Only active parts of apps load into RAM
- When RAM is full, unused parts move to swap (disk)
- OS uses "demand paging" (loads only needed parts)
- Not all pages must be in RAM at once

4. TLB (Translation Lookaside Buffer)
CPU cache for fast virtual-to-physical address translation. Avoids slow page table lookups.

5. Pages and Context Switching
- Page: Fixed memory block (e.g. 4KB)
- Virtual Page: Page in virtual memory
- Context Switch: Switching between running processes
- More swap space = slower switches
- Bigger pages = fewer TLB misses but may waste memory

6. Huge Pages
Larger pages (2MB/1GB vs normal 4KB). Used for big apps (databases) to reduce TLB misses.

7. Memory Fragmentation
When free memory becomes scattered. Two types:
- External: Free memory in small chunks
- Internal: Wasted space within allocated memory
Causes: Can't allocate large blocks even with enough total free memory