Exercises

Looking up hardware specs, easy

look for info about the following resources on your smartphone and laptop:

- processor (e.g., frequency, number of cores)
- RAM (size)
- storage (size, solid state or magnetic)
- peripheral interfaces (USB, Bluetooth)

Getting detailed Hardware info, easy

login to a Linux shell and try the following commands:

- ▶ `lscpu, lsmem, lsusb, lstopo`

Getting detailed Hardware info, easy

login to a Linux shell and try the following commands:

▶ `lscpu`, `lsmem`, `lsusb`, `lstopo`
▶ what do the data tell?

Components of a computer, easy

- what are the basic components of a computer?
- what are the differences between a laptop and a server regarding
  - processing resources?
  - purpose?
  - energy consumption?
- what kind of memory resources exist for computers?
- you are logged in on a Linux server. You want to find out how much RAM the computer has. How would you find out?

Assembling a Computer, easy

▶ assemble and start the computer. Which OS is installed?

▶ poweroff the computer, open the case and identify the following components:

  ▶ HDD
  ▶ RAM
  ▶ CPU
  ▶ GPU

  are there other expansion cards? Which purpose do these have?

▶ would it be possible to start the computer without the case? Identify two reasons why we should use a computer case.

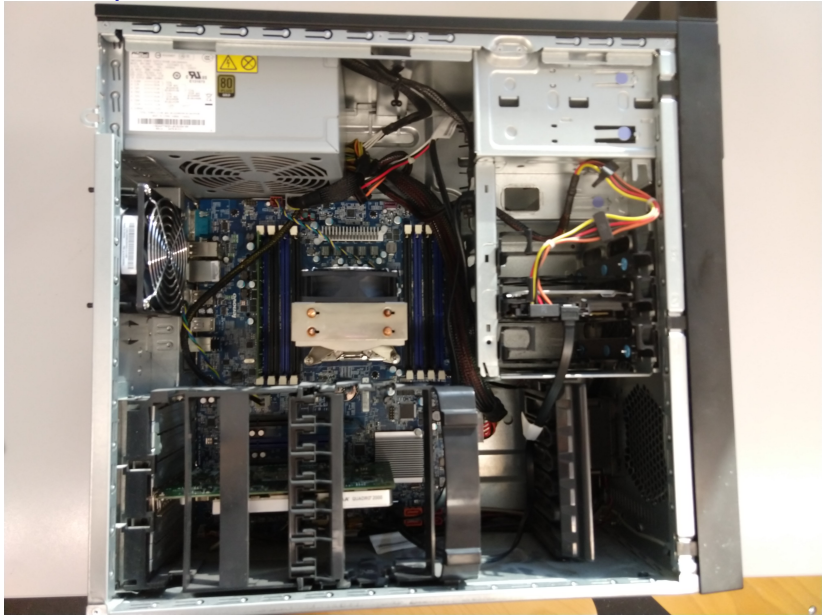▶ remove the HDD and start the computer. What happens?

Open computer case

Figure 1: Gökce Aydos [CC BY 4.0]

HW & SW vocabulary, easy

the lecturer will assign you one of the following words. When it is your turn, explain the word in one or two sentences:

hardware, CPU, GPU, HDD, SSD, memory, memory cell, PC, workstation, mainframe, software, program, BIOS, UEFI, operating system, GUI, application, MIPS, GFLOPS, processor frequency, instruction

System requirements, medium

- goal is to analyze requirements of a system
- the lecturer will split you into groups and assign you a system
- pick a person in your group who will be responsible for paying attention to time
- research/discuss the following questions (15 min)
  - which hardware components from the lecture are required?
  - what are the performance requirements of the system?
  - which software layers are needed?
  - how much will the system cost?
- prepare a presentation about your system and results (15 min)
- present it (5 min)

System 1 - fingerprint database

▶ a central database for fingerprints, e.g., for police department
▶ the user computers should be able to access this database for fingerprint comparison
▶ what are the requirements for the computers required in this system

System 2 - ATM

- analyze an automated teller machine
- what are the requirements for an ATM?

System 3 - Student ID card

- your student ID card can be used for
  - payment on campus
  - accessing restricted areas like parking lot
- what are the requirements for the student ID and the terminals?

System 4 - TollCollect

The TollCollect systems on german highways control the cars if they have paid the toll or not. Which computers are necessary for this system and what should be their specifications?

System 5 - Computer Tomograph (CT)

Imagine a CT in a hospital. What kind of computers are necessary for its operation? What should be their specifications?

System 6 - Call-Center

Imagine a call center for customer support of a company. Where are computers used in this system and what should their specifications?

Exercises Appendix