

Template Week 3 – Hardware

Student number: 585303

Assignment 3.1: Examine your phone

- What processor is in your phone?
My phone has an Apple A15 Bionic processor.
- To which architecture family does this processor belong? In other words, which Instruction Set Architecture (ISA) is used?
The processor belongs to the 64-bit ARM architecture (ARMv8.6-A).
- How much RAM is in it?
4 GB of RAM.
- How much storage does your phone have?
I have 256 GB of storage
- What operating system is running on your phone?
My Phone runs iOS
- Approximately how many applications do you have installed?
28
- Which application do you use the most?
Instagram and TikTok
- Can your phone be charged with what type of plug?
A Lightning cable and it can be plugged into a USB-C or USB-A power adapter
- Which I/O ports can you visually see on your phone?
I can only see the Lightning port at the bottom; my phone doesn't have a headphones port

Assignment 3.2: Examine your laptop

- What processor is in your laptop?
My laptop has an Apple M1 chip.
- To which architecture family does this processor belong? In other words, which Instruction Set Architecture (ISA) is used?
The Apple M1 uses the ARM 64-bit architecture
- How much RAM is in it?
8 GB of RAM.
- How much storage does your laptop have?
512 GB of storage.
- Which operating system is running on your laptop?
It's running macOS Tahoe, version 26.1.

- Approximately how many applications do you have installed?
I have around 25–30 applications installed.
- Which application do you use the most?
The applications I use the most are Safari and Microsoft Word.
- Can your laptop be charged with what type of plug?
My laptop charges with a USB-C plug.
- Which I/O ports can you visually see on your laptop?
I can visually see two USB-C ports and a headphone jack on my laptop.

Assignment 3.3: Power to the laptop

- What is the input voltage?
The input voltage of my power adapter is 100–240 volts.
- What is the output voltage?
The output voltage of my power adapter is 20 volts.
- How many watts can your power adapter deliver?
My power adapter can deliver 30 watts.
- Is the input voltage AC or DC?
The input voltage is AC.
- Is the output voltage AC or DC?
The output voltage is DC.
- AC/DC what is that?
AC means Alternating Current, which changes direction constantly.
DC means Direct Current, which flows in one constant direction.
My power adapter takes AC from the wall and converts it into DC for my laptop.
- If you reverse the polarity of the output voltage, is that bad for your laptop?
Yes, reversing the polarity is bad for the laptop. It can damage the internal components and the battery. USB-C normally prevents this, but reversed polarity on a DC plug is dangerous.
- You forgot your power adapter, your laptop normally needs 15 watts. You will be loaned a power adapter that can deliver 50 watts. Voltage, polarity, etc. are all the same compared to the original power adapter. You can connect the borrowed power adapter to your laptop. What will happen?
If I connect a 50-watt power adapter, nothing bad will happen. My laptop will not take all 50 watts. It will only draw the 15 watts it needs. This works because the voltage and polarity match, and devices only pull the amount of power they require, not the maximum the charger can provide.

Assignment 3.4: Build your dream PC

Component	Selection	Base	Promo	Shipping	Tax	Availability	Price	Where
CPU	AMD Ryzen 7 7700X 4.5 GHz 8-Core Processor	€252.82	—	—	—	In stock	€252.82	amazon.nl Buy X
CPU Cooler	Cooler Master Hyper 212 Black Edition A2 CFM CPU Cooler	€46.11	—	—	—	In stock	€46.11	amazon.nl Buy X
Motherboard	Asus TUF GAMING B650-PLUS ATX AM5 Motherboard	€145.00	—	FREE	—	—	€145.00	MEGAKIO Buy X
Memory	Corsair Vengeance 32 GB (2 x 16 GB) DDR5-5600 CL36	€209.90	—	✓Prime	—	In stock	€209.90	amazon.nl Buy X
+ Add Additional Memory								
Storage	Crucial P3 Plus 1 TB M.2-2280 PCIe 4.0 X4 NVMe Solid State Drive	€99.00	—	FREE	—	—	€99.00	MEGAKIO Buy X
+ Add Additional Storage								
Video Card	NVIDIA Founders Edition GeForce RTX 3060 Ti 8 GB Video Card	—	—	—	—	—	No Prices Available	Buy X
+ Add Another Video Card								
Case	Fractal Design North ATX Mid Tower Case	€129.00	—	FREE	—	In stock	€129.00	ALTERNATE Buy X
Power Supply	MSI MAG A650GL 650 W 80+ Gold Certified Fully Modular ATX Power Supply	€92.57	—	FREE	—	—	€92.57	PARADIGIT Buy X
Operating System	Microsoft Windows 11 Pro OEM - DVD 64-bit	€157.00	—	FREE	—	—	€157.00	PARADIGIT Buy X
Monitor	HP OMEN 24 23.8" 1920 x 1080 165 Hz Monitor	—	—	—	—	—	No Prices Available	Buy X

Justification

I chose a Ryzen 7 7700X because of its balance between performance and price: fast enough for programming, compiling, and multitasking without being excessive.

32 GB of DDR5 RAM ensures that you can work with multiple IDEs, containers, and virtual machines at the same time.

A moderate GPU (RTX 4060) allows for graphics projects and light Machine Learning tasks without going overboard on gaming.

The 1 TB SSD provides enough space and speed for all kinds of projects.

The selected power supply and case ensure reliability, safety, and good ventilation.

Comparison with my current laptop (MacBook Air M1)

Feature	MacBook Air M1	Dream PC
CPU	Apple M1	AMD Ryzen 7 7700X – faster for compiling and multitasking
RAM	8 GB	32 GB DDR5 – ideal for IDEs and containers
Storage	512 GB SSD	1 TB NVMe SSD – more space and speed
GPU	Integrated	RTX 4060 – light graphics acceleration and ML projects
Expansion	Very limited	Fully upgradeable: RAM, storage, GPU
Usage	Study, light tasks	Professional software development and intensive multitasking
Portability	Very high	Lower portability, but much more power and flexibility

Assignment 3.5: Adders

Complete the **half adder**, **full adder** and **4-bit adder** assignment as described in the PowerPoint slides of week 3 in Logisim. Save the chip design and export three PNG pictures of the separate finished designs. See the PowerPoint slides of week 3.

