

Template Week 3 – Hardware

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For better readability the following questions and answers were designed as tables.

Assignment 3.1: Examine your phone

iPhone 11

Question	Answer
What processor is in your phone?	A13 Bionic processor
To which architecture family does this processor belong? (Which ISA is used?)	ARM64
How much RAM is in it?	4GB
How much storage does your phone have?	64 GB
What operating system is running on your phone?	IOS
Approximately how many applications do you have installed?	20 applications
Which application do you use the most?	Facebook and LinkedIn
Can your phone be charged with what type of plug?	USB-C
Which I/O ports can you visually see on your phone?	Lightning port for charging and connecting accessories, SIM card tray

Assignment 3.2: Examine your laptop

MacBook Air M1

Question	Answer
What processor is in your laptop?	Apple M1 chip
To which architecture family does this processor belong? (Which ISA is used?)	ARM64
How much RAM is in it?	8GB
How much storage does your laptop have?	256 GB
Which operating system is running on your laptop?	MacOS
Approximately how many applications do you have installed?	20-30 application
Which application do you use the most?	Safari, VS Code
Can your laptop be charged with what type of plug?	USB-C
Which I/O ports can you visually see on your laptop?	2 USB-C ports for charging and connecting accessories and a headphone jack

Assignment 3.3: Power to the laptop

Question	Answer
What is the input voltage?	The input voltage is a range: 100-240 V~
What is the output voltage?	The output voltage can be 20.0 V, 15.0 V, 9.0 V, or 5.0 V, depending on the device's needs.
How many watts can your power adapter deliver?	The power adapter is labelled as a 30W USB-C adapter, meaning it can deliver up to 30 watts.
Is the input voltage AC or DC?	The input voltage is AC (alternating current).
Is the output voltage AC or DC?	The output voltage is DC (direct current).
AC/DC what is that?	AC stands for alternating current, and DC stands for direct current. Alternating current periodically changes direction, while direct current flows in one direction.



If you reverse the polarity of the output voltage, is that bad for your laptop?

Yes, reversing the polarity of the output voltage could really damage the laptop. It's essential to ensure that the polarity is correct when using power adapters, so the positive and negative terminals are correctly aligned.

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? Also explain why you think that.

Yes, it is safe because the Laptop will only use the powers that it needs. Because:

- Voltage and polarity are the same as the original power adapter
- The power adapter's capacity is its maximum capability, not the amount of power it forces into the device.
- Modern laptops typically have built-in power management and protection mechanisms. They regulate the amount of power they draw from the adapter based on their requirements.

Assignment 3.4: Power in the workplace

What is the result? Explain why you think that and come up with suggestions on what needs to be done.

This situation can result in tripped circuit breakers, power outages, or potential damage to the electrical system.

If 40 employees will all turn on their desktop PC at the same time, each PC consuming 300 Watts, we can count that the combined power demand is $40 \text{ workstations} * 300 \text{ watts} = 12,000 \text{ watts}$. As we know, standard wall sockets are typically designed for lower power loads, around 1,500 to 2,500 watts. Exceeding this limit can result in power outage.

If we still want to handle the power of 40 workstations, we can do the following:

- Distribute the load across multiple circuits or wall sockets
- Use dedicated circuit for each workstation
- Power sequencing: instead of turning on all PCs at the same time, a system can be created where the workstations power on in stages
- Awareness training for employees about electrical circuits, power outage



















Assignment 3.5: Build your dream PC

Screenshots PC configuration + motivation:

My main motivation was to build a high-end and powerful computer, that consists of the best and newest hardware and is able to do anything! On the computer that I have built, you can play games, create virtual machines, hack, code and any sort of professional work. Its premium components make sure that this system is able to run any current application, upcoming applications, demanding software.

My Custom Build

[Edit Part List](#)
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Component	Selection	Price	
CPU	 Intel Core i9-14900K 3.2 GHz 24-Core Processor	€649.95	Buy
CPU Cooler	 NZXT Kraken Elite 360 RGB 78.02 CFM Liquid CPU Cooler	€305.95	Buy
Motherboard	 Asus ROG MAXIMUS Z790 DARK HERO ATX LGA1700 Motherboard	€749.00	Buy
Memory	 Corsair Dominator Platinum RGB 32 GB (2 x 16 GB) DDR5-7600 CL36 Memory	No Prices Available	Buy
Memory	 Corsair Dominator Platinum RGB 32 GB (2 x 16 GB) DDR5-7600 CL36 Memory	No Prices Available	Buy
Storage	 Samsung 990 Pro 1 TB M.2-2280 PCIe 4.0 X4 NVME Solid State Drive	€119.00	Buy
Storage	 Samsung 990 Pro 4 TB M.2-2280 PCIe 4.0 X4 NVME Solid State Drive	€312.95	Buy
Video Card	 Asus ROG Matrix Platinum GeForce RTX 4090 24 GB Video Card	€3499.00	Buy
Case	 Cooler Master Cosmos Infinity 30th Anniversary ATX Full Tower Case	€1154.00	Buy
Power Supply	 SeaSonic PRIME TX 1600 W 80+ Titanium Certified Fully Modular ATX Power Supply	€538.80	Buy
Operating System	 Microsoft Windows 11 Pro OEM - DVD 64-bit	€159.00	Buy
Sound Card	 Asus Xonar Essence STX 24-bit 192 kHz Sound Card	€399.00	Buy
Monitor	 Asus ROG Strix XG27AQM 27.0" 2560 x 1440 270 Hz Monitor	€1160.29	Buy
Keyboard	 SteelSeries Apex Pro TKL (2023) RGB Wired/Bluetooth/Wireless Gaming Keyboard	€269.99	Buy
Mouse	 SteelSeries Aerox 5 Bluetooth/Wireless/Wired/Wired Optical Mouse	€78.98	Buy
Headphones	 SteelSeries Arctis Nova Pro Wireless for PC, PS5, and PS4 Headset	€289.00	Buy
Speakers	 SteelSeries Arena 9 EU 5.1-Channel Speakers	€449.99	Buy
External Storage	 Western Digital WD_BLACK D10 12 TB External Hard Drive	€560.26	Buy
		Total:	€10695.16

My dream PC's parts and why did I choose them (Main parts)

1. **CPU.** Intel Core i9-14900K 3.2 GHz 24-Core Processor
This is a high-performance 24-core processor that is suitable for video gaming, 3D rendering, complex graphics, programming, hacking etc. The high-clock speed makes sure that the computer has fast performance, as running multiple applications can be challenging.
2. **Motherboard.** Asus ROG MAXIMUS Z790 DARK HERO ATX LGA1700 Motherboard
As motherboard is the main component of the computer, so called 'transfer system' between the hardware parts. I chose a high-end motherboard, that has a super-fast power delivery, premium build quality. It gives you an amazing performance and reliability.
3. **Memory.** Corsair Dominator Platinum RGB 64 GB (2 x 32 GB) DDR5-7600 CL36
I added to my dream computer a very large capacity, which can perform wide range of tasks. Its boasting speed and low latency offer us amazing data transfers, making it ideal for demanding tasks.
4. **Storage.** The Samsung 990 Pro 4 TB M.2-2280 PCIe 4.0 x4 NVMe SSD delivers exceptional speed and storage capacity. PCIe 4.0 provides us fast data transfer rates. 4 TB is a boasting capacity, it provides extensive storage for large files, applications, and multimedia content.
5. **Video card.** The Asus ROG Matrix Platinum GeForce RTX 4090 24 GB video card is one of the best for gaming and graphics performance. 24 GB is an enormous video memory, which easily handles graphics-intensive tasks. The Matrix Platinum design from Asus also offers us advanced cooling solutions for optimal thermal management.
6. **Power supply.** The SeaSonic PRIME TX 1600 W power supply is a beast for heavy-duty systems. It's super-efficient, saving power and money with its Titanium certification. Amazing 1600 W, it's the best for gaming, content creation, or serious server action.
7. **Operating System.** The Microsoft Windows 11 Pro OEM - DVD 64-bit is a solid operating system. Designed for professionals, it packs in all the features you need for work and play, enhanced security, and amazing interface. The OEM version means it's meant for system builders, giving you the flexibility to set up your rig just the way you want it.

My current laptop, MacBook M1, is very far from my dream PC.

Firstly, the PC offers an extremely powerful and self-created setup compared to the MacBook Air M1, which gives me higher computing capabilities, focusing gaming, coding, and any other high-demanding tasks. Especially the Intel Core i9-14900K processor and RTX 4090 GPU cannot even be compared the MacBook Air's M1 chip in processing power and graphical capabilities.

While the MacBook Air M1 excels in efficiency, portability, and Apple's ecosystem, my dream PC provides excellent performance, customization options, and compatibility with a wide range of software.