Week 3 – Hardware

Student number: 564530

Assignment 3.1: Examine your phone

What processor is in your phone?

Apple A15 Bionic (5 nm)

To which architecture family does this processor belong? In other words, which Instruction Set

Specifically, it is based on the ARMv8.6-A architecture, which is part of the broader ARM architecture family.

Architecture (ISA) is used?

Apple A15 Bionic processor uses the ARM Instruction Set Architecture (ISA).

How much RAM is in it?

The iPhone 13 Pro has 6 GB of RAM.

How much storage does your phone have?

128 GB

What operating system is running on your phone?

IOS 18.1.1

Approximately how many applications do you have installed?

60 APPLICATIONS

Which application do you use the most?

WhatsApp, Telegram, Discord, Youtube, Safari

Can your phone be charged with what type of plug?

The iPhone 13 Pro uses a Lightning cable for charging. It also supports wireless charging via MagSafe and Qi wireless charging.

Which I/O ports can you visually see on your phone?

- **Lightning port (for charging and data transfer).**
- **Speaker and microphone openings near the bottom edge.**

Assignment 3.2: Examine your laptop

What processor is in your laptop?

2.3 GHz 8-Core Intel Core i9.

To which architecture family does this processor belong? In other words, which Instruction Set Architecture (ISA) is used?

The Intel Core i9 processor belongs to the x86-64 architecture family, which is an extension of the x86 Instruction Set Architecture (ISA).

How much RAM is in it?

16 GB of 2667 MHz DDR4 RAM.

How much storage does your laptop have?

SSD 1TB

Which operating system is running on your laptop?

macOS 15.1.1 (Catalina)

Approximately how many applications do you have installed?

40 APPLICATIONS

Which application do you use the most?

IntelijIDE, Safari, Calendar, Finder…

Can your laptop be charged with what type of plug?

MacBook Pro 2019 charges via a USB-C plug.

Which I/O ports can you visually see on your laptop?

- **Four Thunderbolt 3 (USB-C) ports**.
- **One 3.5mm headphone jack**.

Assignment 3.3: Power to the laptop

What is the input voltage?

The input voltage for my MacBook Pro's power adapter is typically 100–240 V AC.

What is the output voltage?

The output voltage for a MacBook Pro 2019 power adapter is 20 V DC when charging at full power. It can also adjust to 5 V, 9 V, or 15 V DC, depending on the device's needs.

How many watts can your power adapter deliver?

The official power adapter for the MacBook Pro 2019 can deliver 96 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 (Alternating Current):**
    - **The flow of electric charge periodically reverses direction.**
    - **Used for transmitting power over long distances (e.g., through power lines) and is supplied to homes and buildings.**
- **DC (Direct Current):**
    - **The flow of electric charge is unidirectional (constant in one direction).**
    - **Commonly used in batteries and electronic devices like laptops, which require stable, continuous power.**

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

Yes, reversing the polarity is very bad for my laptop.

- **The laptop's internal circuits are designed to operate with a specific polarity. Reversing it can cause:**
    - **Short circuits.**
    - **Permanent damage to internal components.**
    - **Potential safety hazards like overheating or sparking.**
- **However, most modern laptops and power adapters have built-in protection to prevent damage from polarity issues.**

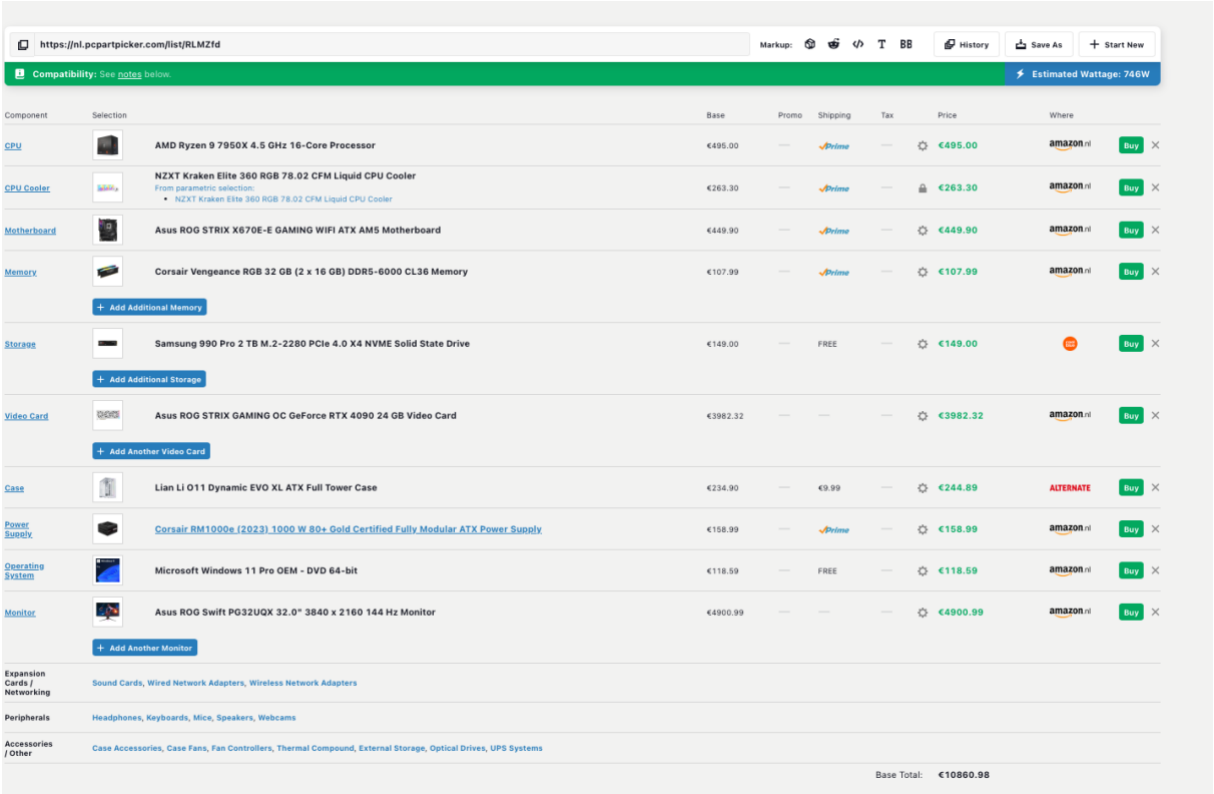
You forgot your power adapter, your laptop normally needs 15 watts. You will be loaned a power adapter that can deliver 50 watts. Voltage, polarity, etc. are all the same compared to the original power adapter. You can connect the borrowed power adapter to your laptop. What will happen? Also explain why you think that.

My laptop will charge and function correctly but at a slower rate.

- **Laptops only draw the power they need. If my laptop requires 15 watts, the borrowed adapter can easily supply it without issue, even though it can deliver up to 50 watts.**
- **The wattage rating (50 W) is the maximum power the adapter can deliver, not what it will necessarily provide.**
- **Since the voltage and polarity match my laptop's requirements, the borrowed adapter is safe to use. So, it is going to be fine.**

Assignment 3.4: Build your dream PC

Screenshots PC configuration + motivation:



https://nl.pcpartpicker.com/list/RLMZfd

Markup: History Save As Start New

Compatibility: See notes below. Estimated Wattage: 746W

Component	Selection	Base	Promo	Shipping	Tax	Price	Where	
CPU	AMD Ryzen 9 7950X 4.5 GHz 16-Core Processor	€495.00	—	Prime	—	€495.00	amazon.nl	Buy
CPU Cooler	NZXT Kraken Elite 360 RGB 78.02 CFM Liquid CPU Cooler From parametric selection: • NZXT Kraken Elite 360 RGB 78.02 CFM Liquid CPU Cooler	€263.30	—	Prime	—	€263.30	amazon.nl	Buy
Motherboard	Asus ROG STRIX X670E-E GAMING WIFI ATX AM5 Motherboard	€449.90	—	Prime	—	€449.90	amazon.nl	Buy
Memory	Corsair Vengeance RGB 32 GB (2 x 16 GB) DDR5-6000 CL36 Memory	€107.99	—	Prime	—	€107.99	amazon.nl	Buy
	+ Add Additional Memory							
Storage	Samsung 990 Pro 2 TB M.2-2280 PCIe 4.0 X4 NVME Solid State Drive	€149.00	—	FREE	—	€149.00		Buy
	+ Add Additional Storage							
Video Card	Asus ROG STRIX GAMING OC GeForce RTX 4090 24 GB Video Card	€3982.32	—	—	—	€3982.32	amazon.nl	Buy
	+ Add Another Video Card							
Case	Lian Li O11 Dynamic EVO XL ATX Full Tower Case	€234.90	—	€9.99	—	€244.89	ALTERNATE	Buy
Power Supply	Corsair RM1000e (2023) 1000 W 80+ Gold Certified Fully Modular ATX Power Supply	€158.99	—	Prime	—	€158.99	amazon.nl	Buy
Operating System	Microsoft Windows 11 Pro OEM - DVD 64-bit	€118.59	—	FREE	—	€118.59	amazon.nl	Buy
Monitor	Asus ROG Swift PG32UQX 32.0" 3840 x 2160 144 Hz Monitor	€4900.99	—	—	—	€4900.99	amazon.nl	Buy
	+ Add Another Monitor							
Expansion Cards / Networking	Sound Cards, Wired Network Adapters, Wireless Network Adapters							
Peripherals	Headphones, Keyboards, Mice, Speakers, Webcams							
Accessories / Other	Case Accessories, Case Fans, Fan Controllers, Thermal Compound, External Storage, Optical Drives, UPS Systems							
					Base Total:	€10860.98		

When it comes to dreaming, I want to dream for real)) To be honest, I am not that much into games, so, in my logic what looks beautiful and costs a lot of money is good! In addition, white is my favorite.

The Dream PC configuration is carefully chosen to handle demanding tasks like gaming, 3D work, and multitasking:

- **AMD Ryzen 9 CPU: A powerful processor for fast performance in gaming, rendering, and multitasking.**
- **RTX 4090 GPU: One of the best graphics cards for high-quality gaming, 3D modeling, and video editing.**
- **32GB DDR5 RAM: Provides enough memory for running multiple applications and future-proofing the system.**
- **2TB SSD: Offers fast storage for quicker loading times and enough space for games, files, and software.**
- **1000W PSU: Ensures a reliable power supply to support all high-performance components.**
- **Liquid Cooling: Keeps the system cool during intense workloads or gaming sessions, maintaining performance.**
- **4K Monitor: Delivers sharp, detailed visuals, ideal for gaming and creative tasks.**

This setup balances performance, speed, and future-readiness for heavy workloads.

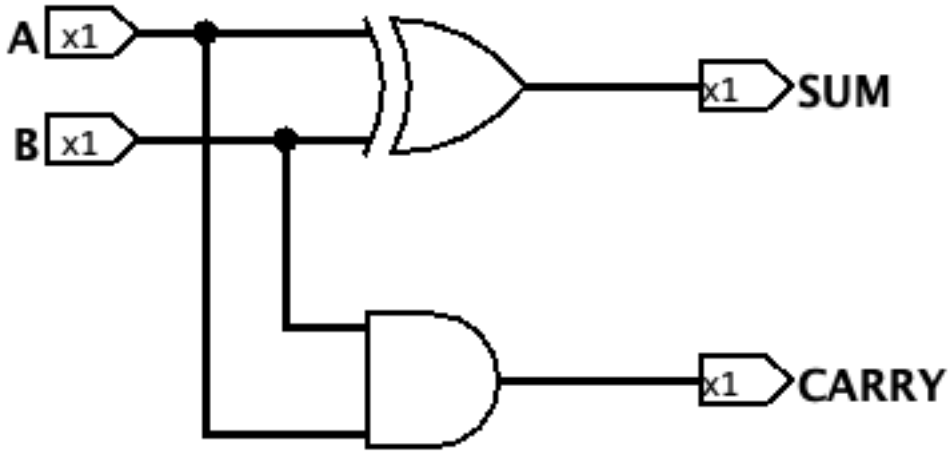
The Dream PC is built for gaming, 3D work, and multitasking, offering superior performance, upgradability, and customizability. In contrast, the MacBook Pro 2019 is portable and better suited for basic productivity and creative tasks but lacks the power and flexibility of the Dream PC. It is obvious that my Mac sucks compare to the PC. However, as for me, when it is enough to complete my all desired tasks then I am fine.

Bonus point assignment – week 3

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 also export three PNG pictures of the separate finished designs. See the PowerPoint slides of week 3.

Paste the three exported PNG pictures in here.

1.



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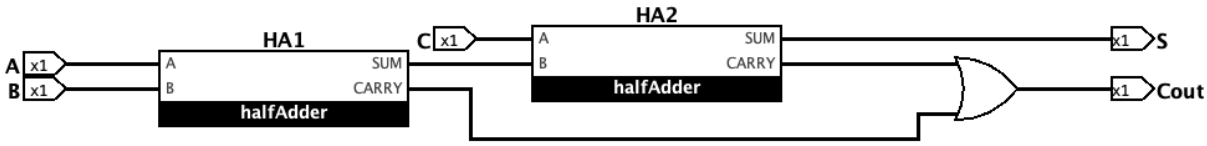

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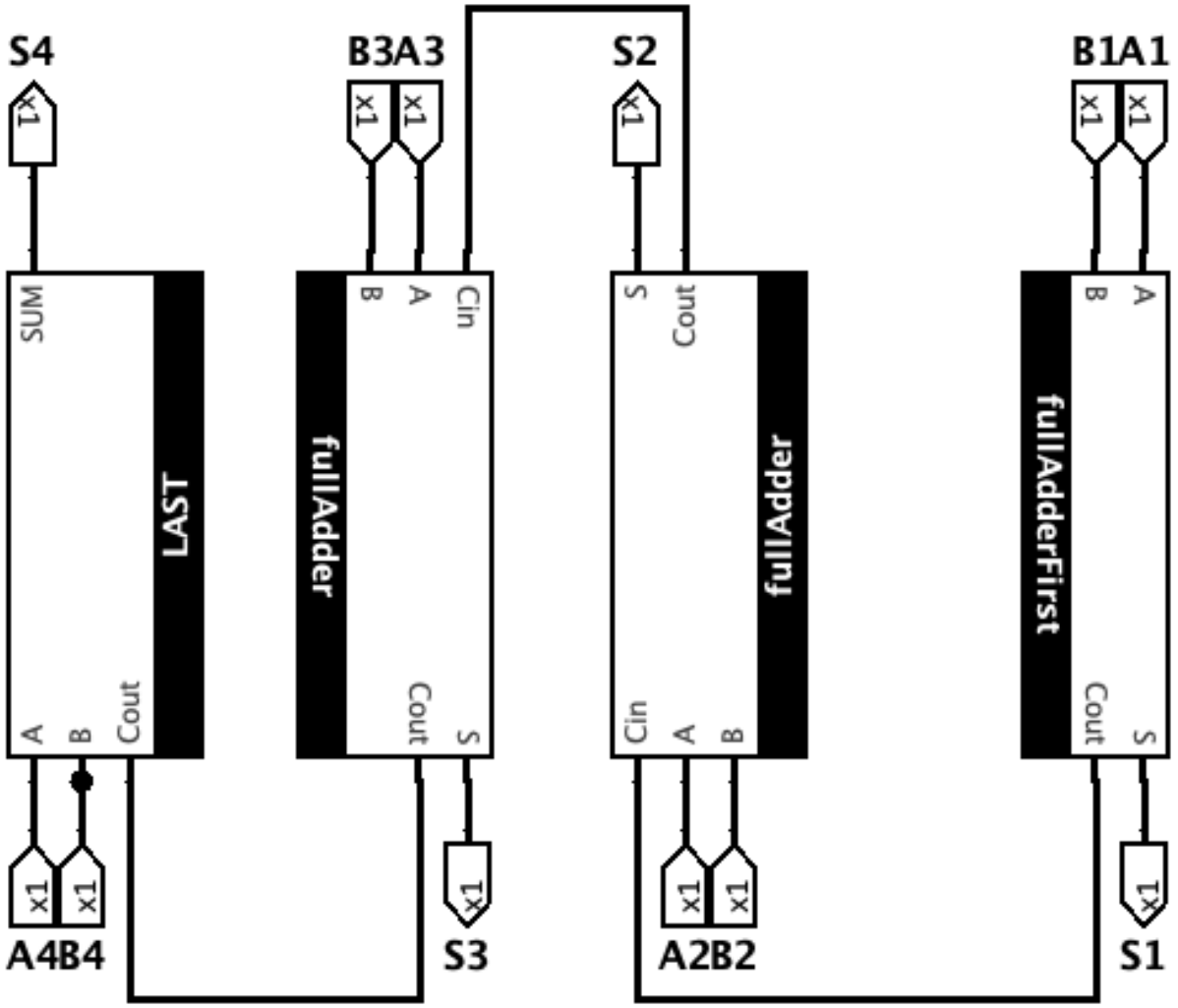
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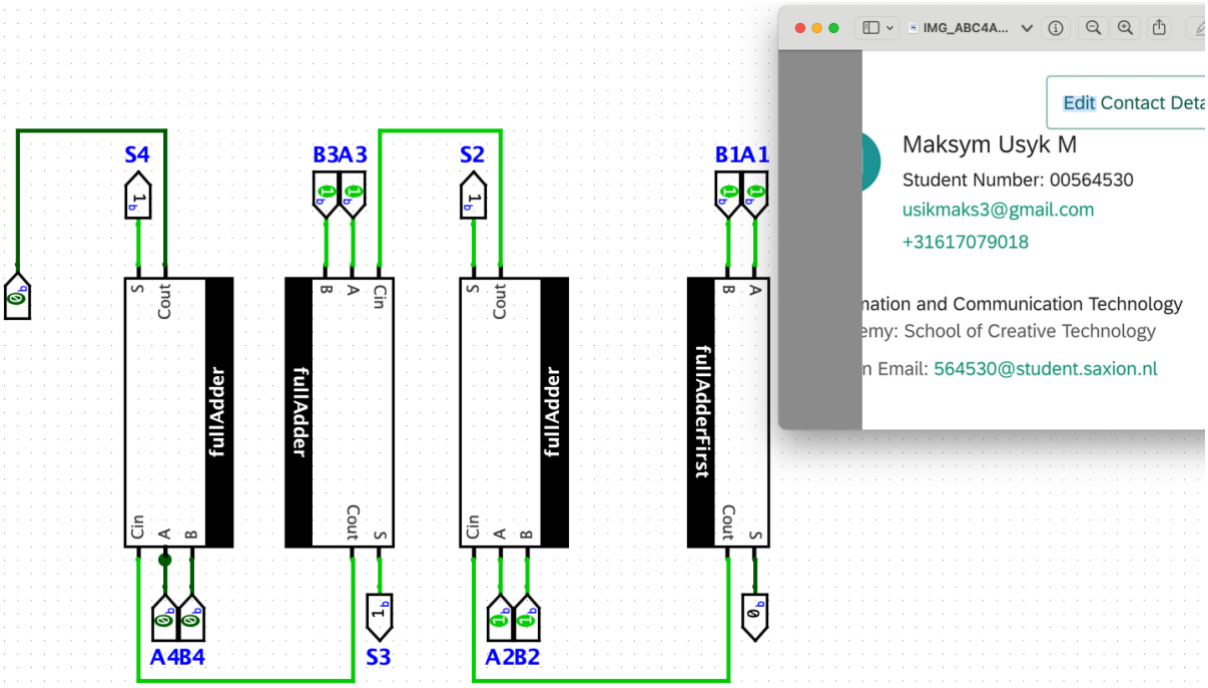
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Maksym Usyk M
Student Number: 00564530
usikmaks3@gmail.com
+31617079018
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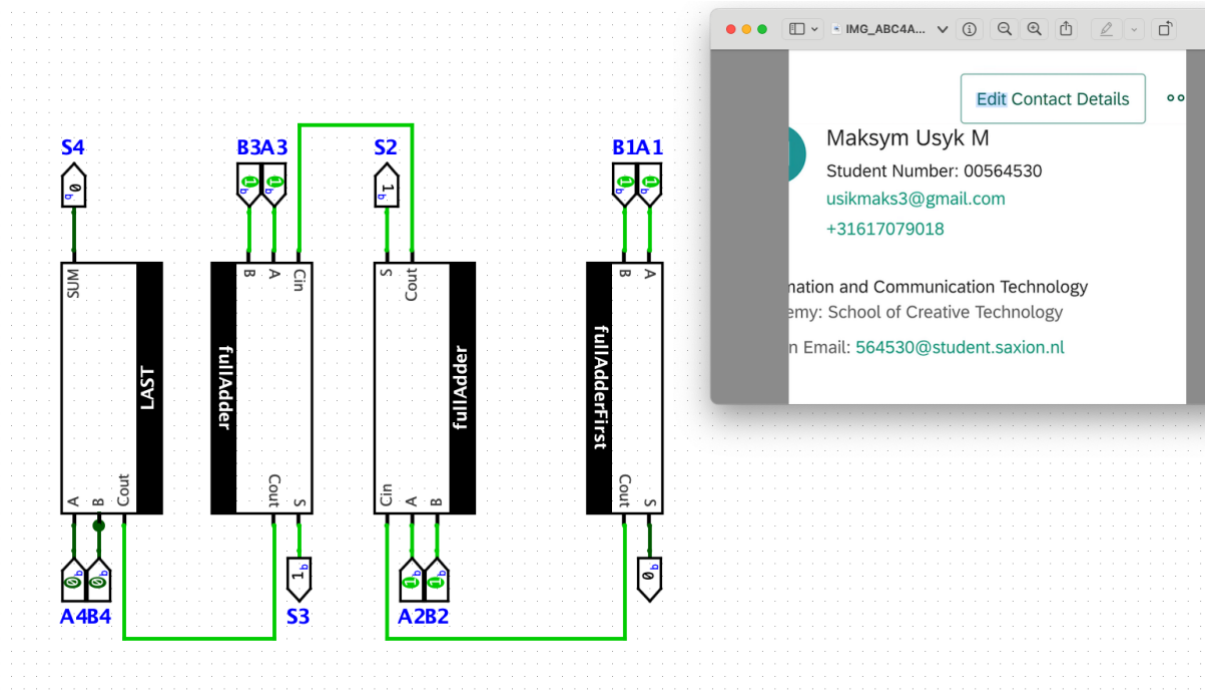
emy: School of Creative Technology
n Email: 564530@student.saxion.nl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Edit Contact Details
Maksym Usyk M
Student Number: 00564530
usikmaks3@gmail.com
+31617079018
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emy: School of Creative Technology
n Email: 564530@student.saxion.nl