

Template Week 3 – Hardware

Student number: 588963

Assignment 3.1: Examine your phone

What processor is in your phone? [Apple 16 Bionic](#)

To which architecture family does this processor belong? In other words, which Instruction Set Architecture (ISA) is used? [The Apple 16 bionic belongs to the ARM architecture family, it uses the ARMv8.6-A ISA.](#)

How much RAM is in it? [6 GB](#)

How much storage does your phone have? [128 GB](#)

What operating system is running on your phone? [iOS](#)

Approximately how many applications do you have installed? [91](#)

Which application do you use the most? [TikTok](#)

Can your phone be charged with what type of plug? [Lightning](#)

Which I/O ports can you visually see on your phone? [Lightning port, speakers, buttons and SIM port.](#)

Assignment 3.2: Examine your laptop

What processor is in your laptop? [Apple M4](#)

To which architecture family does this processor belong? In other words, which Instruction Set Architecture (ISA) is used? [The Apple 16 bionic belongs to the ARM architecture family, it uses the ARMv9.2-A ISA.](#)

How much RAM is in it? [16 GB](#)

How much storage does your laptop have? [512 GB](#)

Which operating system is running on your laptop? [macOS](#)

Approximately how many applications do you have installed? [73](#)

Which application do you use the most? [Safari](#)

Can your laptop be charged with what type of plug? [MagSafe 3 or USB-C](#)

Which I/O ports can you visually see on your laptop? [Two USB-C ports, MagSafe 3 port en 3.5mm headphone jack.](#)

Assignment 3.3: Power to the laptop

What is the input voltage? [100-240V](#)

What is the output voltage? [20 V](#)

How many watts can your power adapter deliver? [35 watts](#)

Is the input voltage AC or DC? [AC](#)

Is the output voltage AC or DC? [DC](#)

AC/DC what is that? [AC stands for alternating current, an electric current that periodically changes direction. DC stands for direct current, where the current only flows in one direction.](#)

If you reverse the polarity of the output voltage, is that bad for your laptop? [Yes, it is bad for the laptop, it will be damaged, and the motherboard may be damaged. The internal electronics are designed to work with one direction only.](#)

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.

[Nothing bad will happen, the laptop will charge normally because it will just take the power it needs \(15\).](#)

Assignment 3.4: Build your dream PC

Screenshots PC configuration + motivation:

Component	Selection	Base	Promo	Shipping	Tax	Availability	Price	Where	
CPU	 AMD Ryzen 7 7800X3D 4.2 GHz 8-Core Processor From parametric selection: <ul style="list-style-type: none">AMD Ryzen 7 7800X3D 4.2 GHz 8-Core Processor	€339.90	—	—	—	In stock	🔒 €339.90	amazon.nl	Buy 
CPU_Cooler	 Lian Li GALAHAD AIO 360 RGB 69.17 CFM Liquid CPU Cooler	€260.00	—	—	—	In stock	⚙️ €260.00	amazon.nl	Buy 
Motherboard	 MSI MAG X870 TOMAHAWK WIFI ATX AM5 Motherboard	€289.99	—	—	—	In stock	⚙️ €289.99	amazon.nl	Buy 
Memory	 Corsair Vengeance RGB 32 GB (2 x 16 GB) DDR5-6000 CL36 Memory	€402.00	—	FREE	—	In stock	⚙️ €402.00	ALTERNATE	Buy 
Storage	 Samsung 990 Pro 4 TB M.2-2280 PCIe 4.0 X4 NVME Solid State Drive	€288.88	—	—	—	In stock	⚙️ €288.88	amazon.nl	Buy 
Video_Card	 NVIDIA Founders Edition GeForce RTX 5090 32 GB Video Card	€3289.99	—	—	—	In stock	⚙️ €3289.99	amazon.nl	Buy 
Case	 Corsair 9000D RGB AIRFLOW ATX Full Tower Case	€499.00	—	—	—	In stock	⚙️ €499.00	amazon.nl	Buy 
Power_Supply	 Asus ROG THOR 1600T Gaming 1600 W 80+ Titanium Certified Fully Modular ATX Power Supply	€619.16	—	—	—	In stock	⚙️ €619.16	amazon.nl	Buy 
Operating_System	 Microsoft Windows 11 Pro Retail - Download 64-bit	€258.00	—	FREE	—	In stock	⚙️ €258.00	bol.	Buy 

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Wireless Network Adapter		Asus PCE-AX58BT 802.11a/b/g/n/ac/ax PCIe x1 Wi-Fi Adapter	€105.00	—	Prime	—	In stock	💡 €105.00	amazon.nl Buy X
Case Fan		Lian Li UNI FAN TL LCD 120 Reverse Blade 83.4 CFM 120 mm Fans 3-Pack	€230.76	—	—	—	In stock	💡 €230.76	amazon.nl Buy X
Fan Controller		Lian Li UNI HUB – SL Controller Fan Controller	€109.00	—	—	—	In stock	💡 €109.00	amazon.nl Buy X
Monitor		Samsung Odyssey Neo G9 49.0" 5120 x 1440 240 Hz Curved Monitor	€2178.33	—	Prime	—	In stock	💡 €2178.33	amazon.nl Buy X
Keyboard		Razer BlackWidow V4 Pro RGB Wired Gaming Keyboard	€215.00	—	FREE	—	In stock	💡 €215.00	bol. Buy X
Mouse		Asus ROG Spatha Wireless Laser Mouse	€297.00	—	—	—	In stock	💡 €297.00	amazon.nl Buy X
Headphones		Corsair HS80 RGB 7.1 Channel Headset	€109.90	—	FREE	—	—	💡 €109.90	MEGEKKO Buy X
Speakers		SteelSeries Arena 9 EU 5.1-Channel Speakers	€479.00	—	—	Prime	In stock	💡 €479.00	amazon.nl Buy X
UPS		APC SMX1500RMI2U UPS	€1564.37	—	—	—	In stock	💡 €1564.37	amazon.nl Buy X
Webcam		Logitech BRIO Ultra HD Pro Webcam	€149.94	—	—	Prime	In stock	💡 €149.94	amazon.nl Buy X

CPU: I chose for AMD Ryzen 7 7800X3D because it is one of the fastest gaming processors in the world and it gives extreme high framerates.

CPU Cooler (Lian Li Galahad AIO 360 RGB): This 360mm cooler gives ultra-low temperature, it is quite and has premium quality. Also, it works good in combination with the chosen CPU.

Motherboard (MSI MAG X870 Tomahawk WIFI): This motherboard has DDR% memory, PCIe 5.0, WIFI 7, it is just perfect for AM5 build.

Memory (32GB Corsair Vengeance RGB DDR5-6000 CL36): This RAM is optimized for the Ryzen 7000 series, offering high speed, low latency and excellent stability. Perfect for gaming.

Storage (Samsung 990 Pro 4TB NVMe SSD): It can read to 7450 MB/s, enough storage for games and high reliability.

GPU (NVIDIA RTX 5090 32GB Founders Edition): It is one of the strongest GPU in the world, perfect for 4K/8K gaming and rendering.

Case (Corsair 9000D RGB Airflow): Big space for extra's, beautiful tempered glass and enormous airflow.

Power Supply (Asus ROG THOR 1600W Titanium): This one provides more than the needed power with less heat and greater stability.

Operating System (Windows 11 Pro): Compatible with all tools and drivers and professional features for development and virtualization.

Wireless Network Adapter (ASUS PCE-AX58BT): High connection with high speeds, perfect for large downloads.

Case Fan (Lian Li UNI Fan TL LCD 120mm Reverse Blade 3-pack): Extreme airflow and LCD screens, it keeps the pc cool.

Fan Controller (Lian Li UNI HUB): Required to regulate the speed and operation pf industrial fans.

Monitor (Samsung Odyssey Neo G9 49"): 5120 x 1440 resolution, 240Hz. It is perfect for multitasking.

Keyboard (Razer BlackWidow V4 Pro): premium switches, RGB and excellent build quality.

Mouse (ASUS ROG Spatha Wireless Leaser Mouse): Wireless High-end mouse with multi buttons and low latency.

Headset (Corsair HS80): Wireless, comfortable, good audio and surround sound.

Speakers (SteelSeries Arena 9): One of the best speakers sets, perfect audio for movies and games.

UPS (APC SMX1500RMI2U): To protect your PC, against power outages and Data loss.

Webcam (Logitech Brio Ultra HD Pro): Professional 4K webcam for meetings and gaming.

Why this configuration?

I built this PC with the following goals:

- Maximum gaming performance
- Ultra-fast storage
- Premium audio
- Maximum cooling
- Quiet operation
- UPS protection

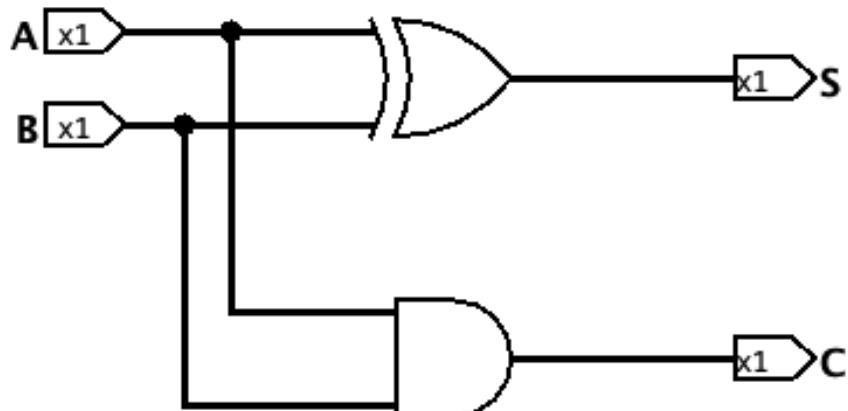
Element	Dream PC	MacBook M4	Difference
CPU	AMD Ryzen 7 7800X3D	Apple M4	Ryzen is much faster, but M4 is more energy efficient
GPU	NVIDIA RTX 5090	10-core Apple GPU	RTX 5090 is more than 20x faster for all the tasks
RAM	32GB	16GB	PC has twice as much memory and higher speed
Storage	4TB	512GB	Higher speed and 8x more storage
Display	49" Mini-LED 240Hz	13" 60Hz	PC display is much bigger, faster and better for multitasking
Cooling	360mm liquid cooling	Passive cooling	Pc stays cool with high load
Power supply	1600W Titanium	35W adapter	Pc uses too much power for extreme performance, MacBook is super-efficient

Software	Windows 11 Pro	macOS	Both have strong points, but Windows 11 Pro is better for gaming
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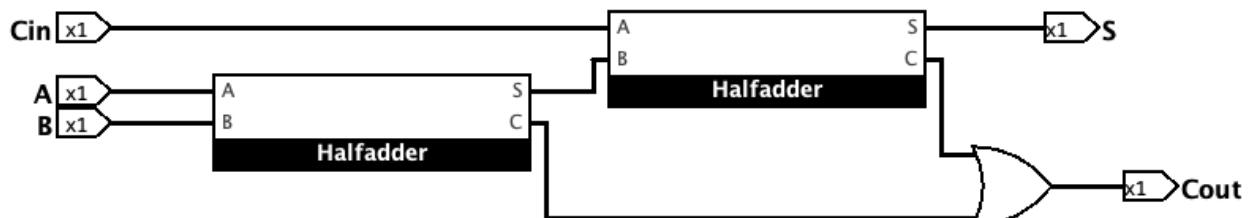
Assignment 3.5: Adders

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 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.

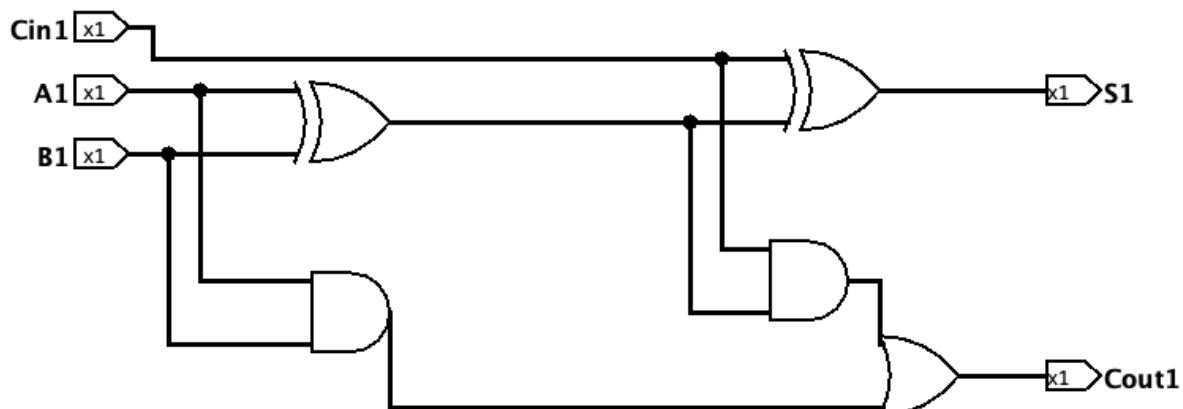


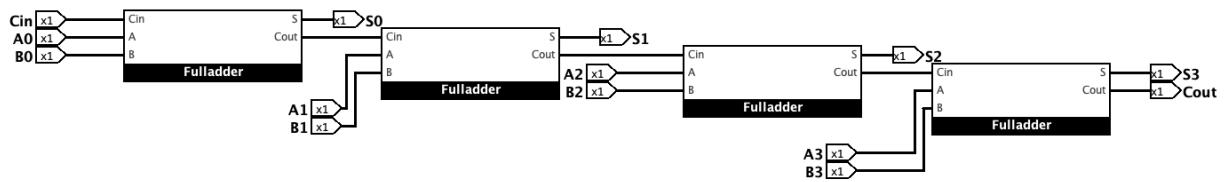
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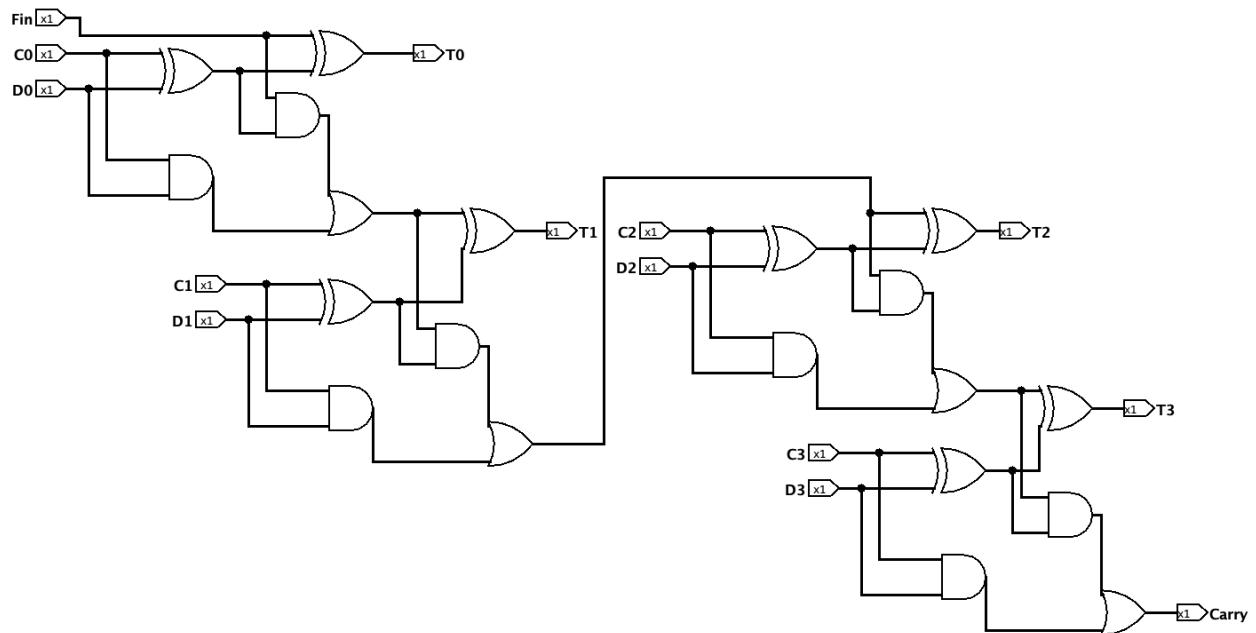
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Hetzelfde full adder in twee vormen





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Hetzelfde 4 Bit adder in twee vormen



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