Template Week 3 – Hardware

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Assignment 3.1: Examine your phone

What processor is in your phone?

Samsung Exynos 9825,73GHz

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

My laptop's processor uses the x86-64 instruction set architecture.

How much RAM is in it?

11418 MB

How much storage does your phone have?

229,12 GB

What operating system is running on your phone?

Android version 12

Approximately how many applications do you have installed?

370

Which application do you use the most?

Spotify

Can your phone be charged with what type of plug?

USB-c

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

USB-c, micro-sd

Assignment 3.2: Examine your laptop

What processor is in your laptop?

Intel Core Ultra 9 185H

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

DDR5 memory controller architecture

How much RAM is in it?

32GB

How much storage does your laptop have?

1 TB

Which operating system is running on your laptop?

Windows 11 Home Version 25H2

Approximately how many applications do you have installed?

50

Which application do you use the most?

Google chrome

Can your laptop be charged with what type of plug?

USB-c

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

1x HDMI, 2x Thunderbolt 4 (USB) 2x USB type-C 1x headphone jack

Assignment 3.3: Power to the laptop

What is the input voltage?

| 100–240V AC, 50/60Hz |

What is the output voltage?

| 20V DC |

How many watts can your power adapter deliver?

| 140W |

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. It is an electric current where the direction of electron flow periodically reverses. So it goes back and forth.
DC stands for Direct Current and has a constant one-direction flow. |

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

| Very bad indeed. So if current tries to flow the "wrong" way, electrons are pushed in the opposite direction of what the circuit was designed for. Without a protection stage like a Reverse-polarity protection MOSFET, diode or fuse (which are present in most laptops) the semiconductor (PN)junctions are reverse-biased beyond limits and breakdown, electrolytic capacitors are polarized and if the reversed voltage reaches the voltage regulators, battery charging IC or embedded controller, they die instantly. |

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.

| In the story above there is already a hint given. As you can see the key word 'deliver' is used just before the 50 watts. A power adapter has a certain capability of 'giving' power and not pushing power. So if the laptop, which in this case needs 15 watts, asks for 15 watts, the power adapter will only give what the laptop asks and not push what the power adapter is maximal capable of. So the delivery will be 15 watts :). So the laptop will charge as normal. |

Assignment 3.4: Build your dream PC

Component	Selection	Base	Promo	Shipping	Tax	Availability	Price	Where
CPU	AMD Ryzen 9 9950X3D 4.3 GHz 16-Core Processor	€699.00	—	FREE	—	In stock	€699.00	AZERTY Buy ✕
CPU Cooler	Corsair NAUTILUS 240 RS ARGB 74.37 CFM Liquid CPU Cooler	€100.00	—	✓Prime	—	In stock	€100.00	amazon.nl Buy ✕
Motherboard	Gigabyte X870 AORUS ELITE WIFI7 ICE ATX AM5 Motherboard	€285.00	—	✓Prime	—	In stock	€285.00	amazon.nl Buy ✕
Memory	Corsair Vengeance RGB 64 GB (2 x 32 GB) DDR5-5600 CL40 Memory	€1433.67	—	€3.95	—	In stock	€1437.62	AZERTY Buy ✕
	+ Add Additional Memory							
Storage	Lexar NM790 4 TB M.2-2280 PCIe 4.0 X4 NVME Solid State Drive	€359.00	—	FREE	—	In stock	€359.00	AZERTY Buy ✕
	+ Add Additional Storage							
Video Card	NVIDIA Founders Edition GeForce RTX 5090 32 GB Video Card	€3289.99	—	—	—	In stock	€3289.99	amazon.nl Buy ✕
	+ Add Another Video Card							
Case	Corsair FRAME 4000D RS ARGB ATX Mid Tower Case	€107.50	—	✓Prime	—	In stock	€107.50	amazon.nl Buy ✕
Power Supply	Corsair RM1000e (2023) 1000 W 80+ Gold Certified Fully Modular ATX Power Supply	€190.76	—	✓Prime	—	Available soon	€190.76	amazon.nl Buy ✕
Operating System	Microsoft Windows 11 Home OEM - DVD 64-bit	€126.00	—	FREE	—		€126.00	PARADIGIT Buy ✕
Case Fan	Corsair RS120 ARGB 72.8 CFM 120 mm Fans 3-Pack	€45.49	—	✓Prime	—	In stock	€45.49	amazon.nl Buy ✕
	+ Add Another Case Fan							
Monitor	Dell Alienware AW3225QF 31.6" 3840 x 2160 240 Hz Curved Monitor	€1049.00	—	FREE	—		€1049.00	MEGEKKO 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							

Cpu-ryzen 9: is currently the best gaming cpu there is. It has low memory latency, which is good for gaming. And 16 cores, good for rendering and heavy multitasking.
ram-64GB DDR5, games eat up a lot of rem, it's a bit exaggerated to take a 64 ram because 32 would suffice but it's never wrong to prepare for the future.
Storage Lexar 4TB – it's said to be fast, and it can hold a lot of games,.
GPU RTX 5090 – it's expensive but has a high 4k frame rate 4k at 240 hz. So the games keep playing smooth.

At the moment I have the **Azerty Gaming Titanium White - iCUE Certified** .
With the intel i9, has 10 cores so it wont be as fast as the ryzen 9
NVIDIA GeForce RTX 3080, with 10GB VRAM, which is still good but not as powerful as the 5090 which has 32GB VRAM
My ram now is 32 DDR4 and that of the dream pc a 64GB DDR5 also not as fast.
I got 1 TB NVMe SSD + 3 TB HDD storage in my pc. Because of the HDD it wont be as fast.

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.

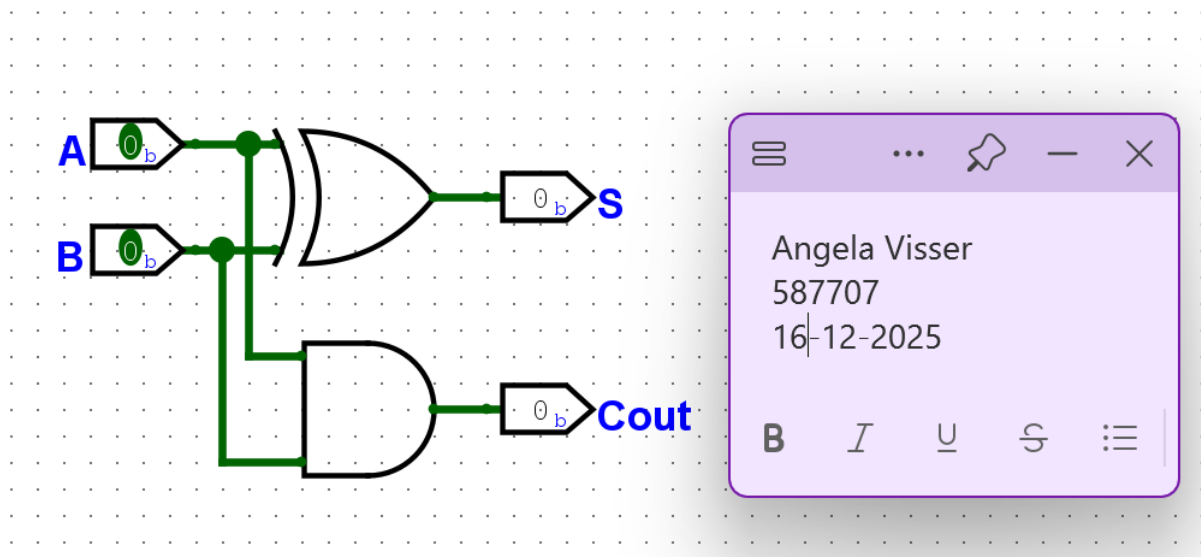Paste the three exported PNG pictures in here.
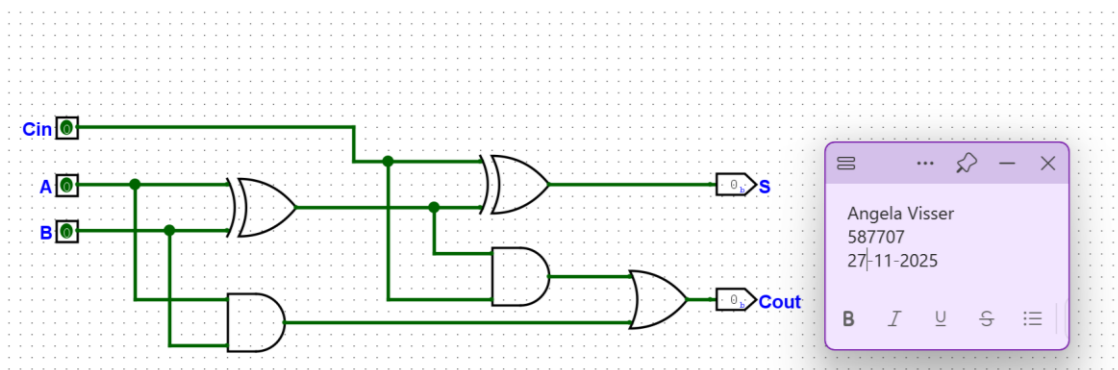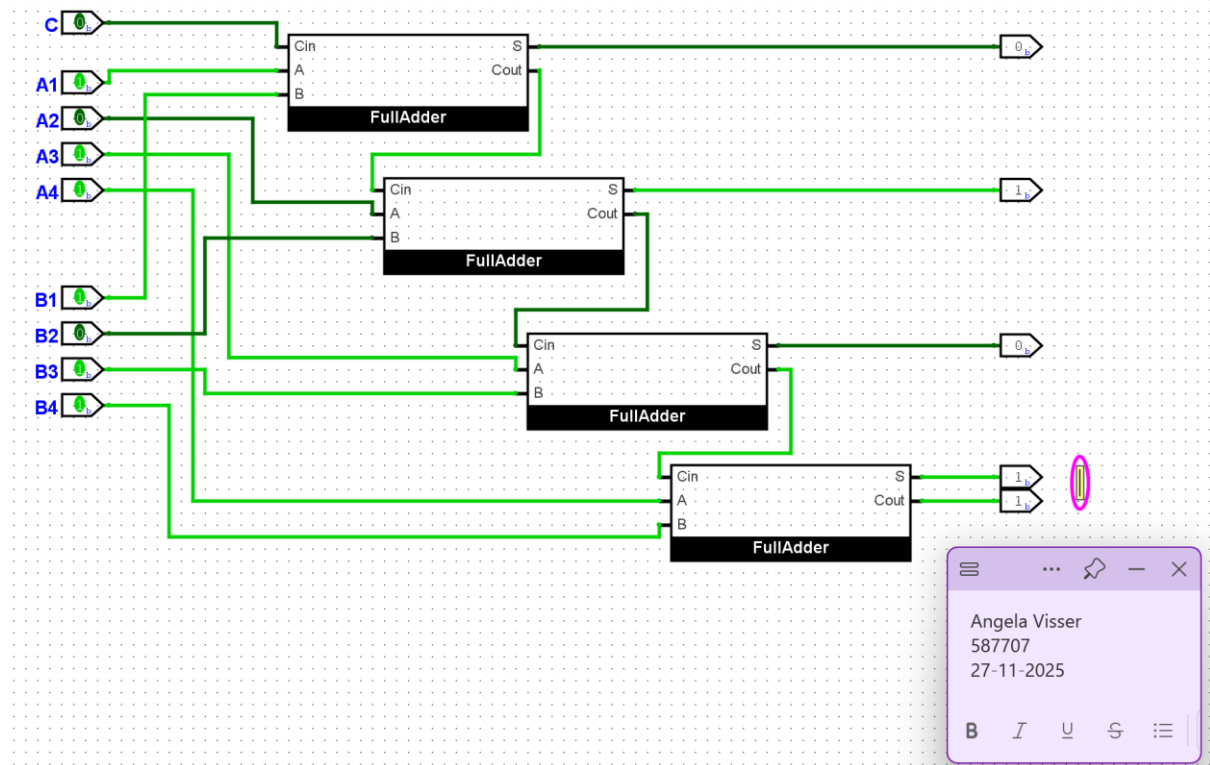

Figure 1. Half adder

Figure 2. Full adder

Figure 3. 4 bit adder

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