

Week 3 – Hardware.

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Assignment 3.1: Examine your phone

What processor is in your phone?

I have iPhone 16. It has Apple A18 chip.

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

The ISA of A18 chip is ARM/ARM64.

How much RAM is in it?

My iPhone has 8 GB of RAM.

How much storage does your phone have?

It has 256 GB of storage.

What operating system is running on your phone?

My phone has iOS 18, but it also supports the newest iOS 26.

Approximately how many applications do you have installed?

I have 143 applications installed.

Which application do you use the most?

I mostly use Google, Telegram, TikTok and YouTube.

Can your phone be charged with what type of plug?

The iPhone 16 uses a USB-C port for wired charging and it also supports wireless charging.

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

The only I/O port I can see on my phone is USB-C port.

Assignment 3.2: Examine your laptop

What processor is in your laptop?

I have an ASUS TUF Gaming 15. It has an Intel Core i7-13620H.

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

The ISA of the Intel Core i7 is x86.

How much RAM is in it?

My laptop has 16 GB of RAM.

How much storage does your laptop have?

It has 1 TB of SSD storage.

Which operating system is running on your laptop?

My laptop is running Windows 11.

Approximately how many applications do you have installed?

I have approximately 110 applications installed.

Which application do you use the most?

I use Chrome, Steam and IntelliJ the most.

Can your laptop be charged with what type of plug?

My laptop charges with a dedicated ASUS barrel-type power adapter.

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

The I/O ports I can see on my laptop are USB-A ports, USB-C port, HDMI port, Ethernet port, 3.5 mm audio jack, Charging port

Assignment 3.3: Power to the laptop

What is the input voltage?

The input voltage of my laptop power adapter is 100–240 V.

What is the output voltage?

The output voltage is 20V.

How many watts can your power adapter deliver?

My adapter can deliver 240W maximum.

Is the input voltage AC or DC?

AC is an input voltage.

Is the output voltage AC or DC?

DC is an output voltage.

AC/DC what is that?

AC is an electric current that periodically reverses direction and it goes from the sockets. DC flows in one direction only. Laptops need DC to run, so the adapter converts AC from the wall into DC.

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

Yes, reversing the polarity is very bad. It can damage my computer, because the power will flow in the wrong direction.

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.

The laptop will work normally, because a loaned adapter can deliver maximum of 50 watts, but it doesn't force that energy into computer. So if my computer needs less, it will get number of watts that it needs.

Assignment 3.4: Build your dream PC

Screenshots PC configuration + motivation:

Compatibility: See details below.							⚡ Estimated Wattage: 982W	
Component	Selection	Base	Promo	Shipping	Tax	Availability	Price	Where
CPU	 Intel Core Ultra 9 285K 3.7 GHz 24-Core Processor	€561.35	—	✓Prime	—	In stock	€561.35	amazon.nl <button>Buy</button> X
CPU Cooler	 NZXT Kraken Elite 360 RGB (2024) 75.12 CFM Liquid CPU Cooler	€288.64	—	✓Prime	—	In stock	€288.64	amazon.nl <button>Buy</button> X
Motherboard	 Asus PRIME Z890-P WIFI ATX LGA1851 Motherboard	€219.90	—	✓Prime	—	In stock	€219.90	amazon.nl <button>Buy</button> X
Memory	 Corsair Dominator Titanium 64 GB (2 x 32 GB) DDR5-6600 CL32 Memory	€1120.00	—	€5.95	—	In stock	€1125.95	ALTERNATE <button>Buy</button> X
+ Add Additional Memory								
Storage	 Samsung 990 EVO Plus 2 TB M.2-2280 PCIe 5.0 X2 NVME Solid State Drive	€233.00	—	✓Prime	—	Available soon	€233.00	amazon.nl <button>Buy</button> X
+ Add Additional Storage								
Video Card	 Asus TUF GAMING GeForce RTX 5090 32 GB Video Card	€4327.18	—	—	—	In stock	€4327.18	amazon.nl <button>Buy</button> X
+ Add Another Video Card								
Case	 Lian Li Lancool II Mesh ATX Mid Tower Case	€630.91	—	—	—	In stock	€630.91	amazon.nl <button>Buy</button> X
Power Supply	 be quiet! Dark Power Pro 13 1300 W 80+ Titanium Certified Fully Modular ATX Power Supply	€403.05	—	€5.95	—	In stock	€409.00	AZERTY <button>Buy</button> X
Operating System	 Microsoft Windows 11 Pro Retail - Download 64-bit	€258.00	—	FREE	—	In stock	€258.00	bol. <button>Buy</button> X

The screenshot shows a shopping cart from bol.com. It contains two items:

- Microsoft Windows 11 Pro Retail - Download 64-bit**: €258.00, FREE, In stock, €258.00, **Buy**
- Asus ROG Swift OLED PG32UCDP 31.5" 3840 x 2160 240 Hz Monitor**: €999.00, FREE, In stock, €999.00, **Buy**

Below the items are category links: Expansion Cards / Networking, Peripherals, and Accessories / Other. At the bottom, it shows Base Total: €9041.03, Shipping: €11.90, and Total: €9052.93. A "Buy From Amazon Netherlands" button is also present.

This setup runs all games at 4K ultra 200+ FPS with ray tracing, so I will be definitely ready for upcoming GTA 6. 64 GB DDR5 means zero slowdowns when I run any apps and Chrome with 50 tabs. The Ultra 9 285K will handle literally every task I give to him.

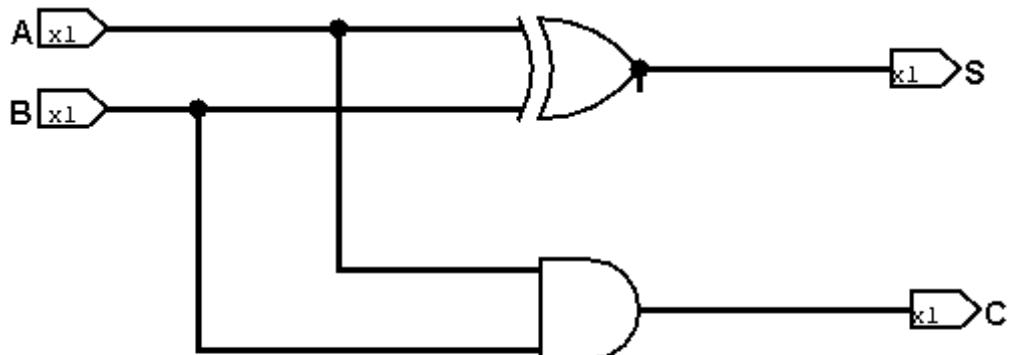
Comparison

My ASUS TUF F15's i7-13620H and RTX 4060 handle 1080p gaming fine but get hot after 30 minutes, FPS may drop to 50-60 on high setting in modern games, and 16 GB RAM can't handle multiple few VMs at the same time on high speed. Storage fills up fast too. The Dream PC's much stronger CPU and GPU, four times more RAM, huge fast SSD run everything smoothly and liquid cooling keeps it cool during long sessions. The only one advantage of my laptop is that it is portable, I can take it anywhere.

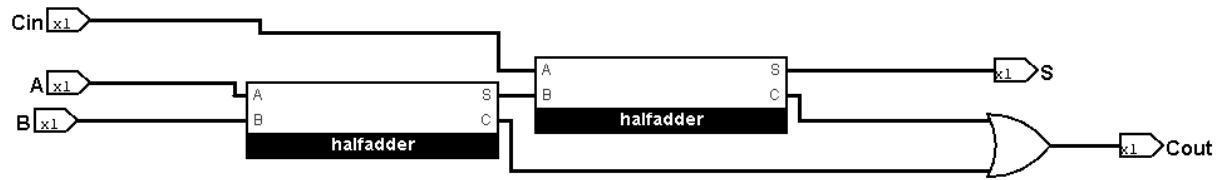
Assignment 3.5: Adders

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.

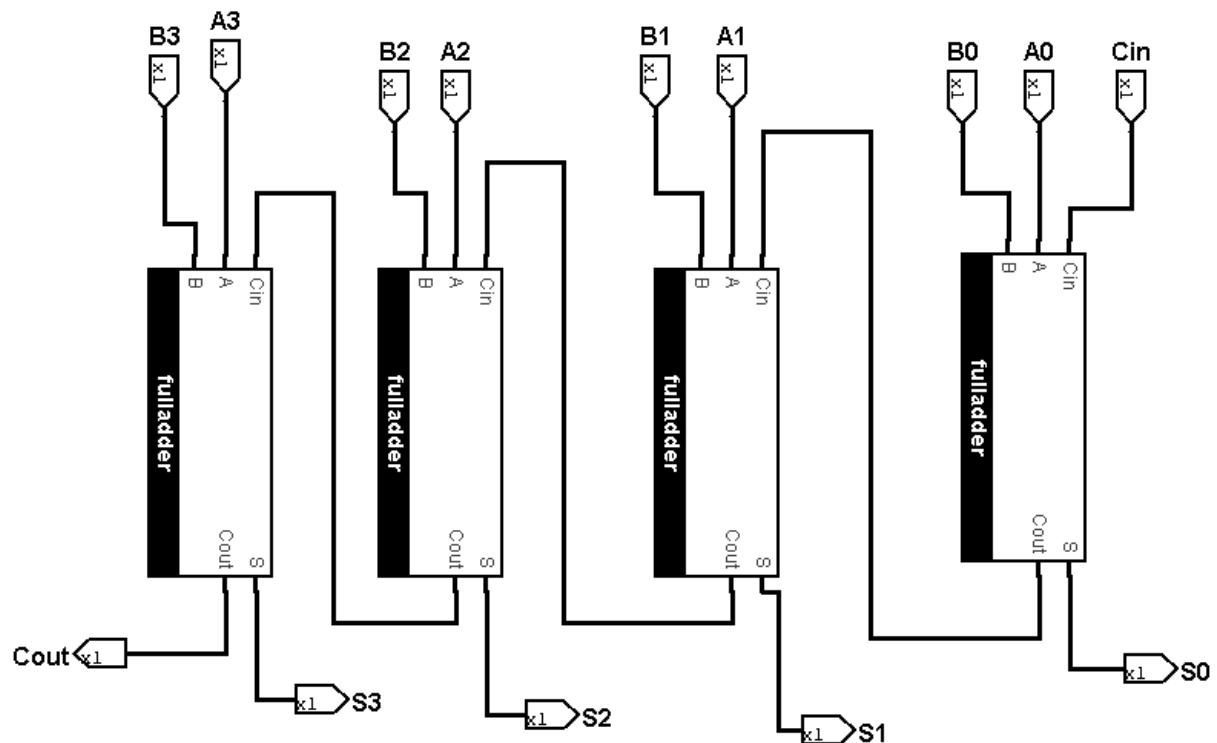
Paste the three exported PNG pictures in here.



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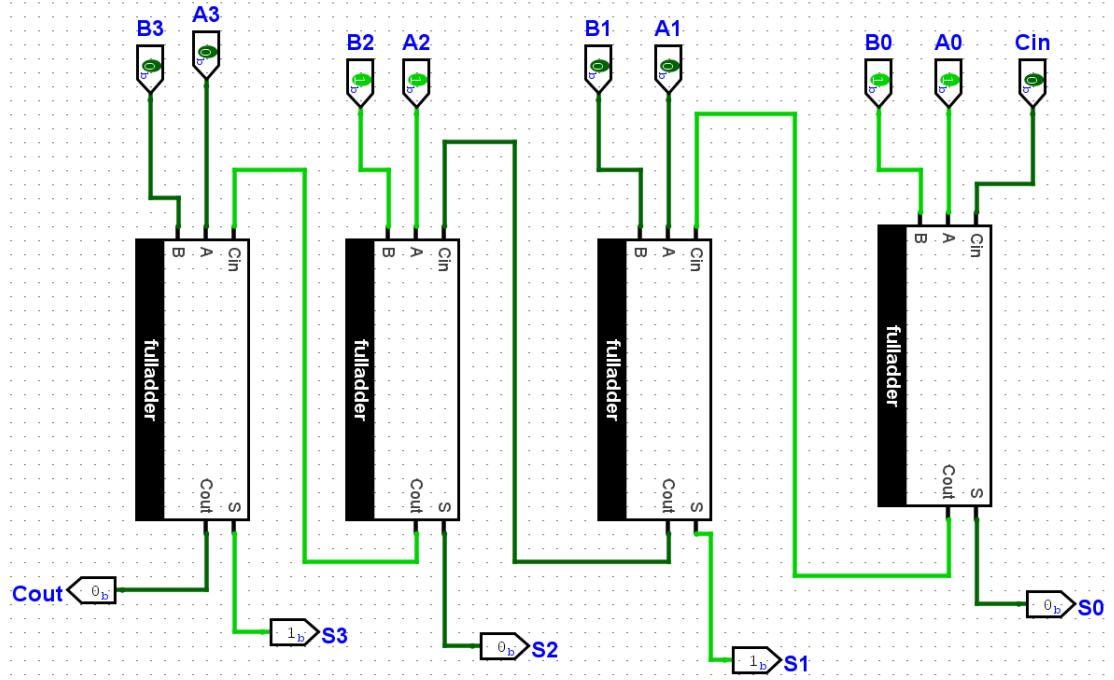


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A screenshot of adding 5 + 5 to show that it works.



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