Template Week 3 – Hardware

Student number:

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Assignment 3.1: Examine your phone

-What processor is in your phone?

I have a iPhone 13 Pro which uses Apple's A15 Bionic chip.

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

The A15 Bionic is based on the **ARM architecture**, specifically a 64-bit ARM ISA (ARMv8-A).

-How much RAM is in it?

The iPhone 13 Pro has **6 GB** of RAM.

-How much storage does your phone have?

I have 512 GB of storage

-What operating system is running on your phone?

I currently have the iOS 17 update.

-Approximately how many applications do you have installed?

Except from the default ones you get with the phone, I have around 10 apps.

-Which application do you use the most?

I mostly use FireFox, Instagram, BrawlStars.

-Can your phone be charged with what type of plug?

It uses an Apple lightning cable.

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

It has a port on the bottom data for charging/data transfer, a speaker on the top front and one on the bottom. Also on the sides, there is the volume buttons, the ringer switch, and the power (side) button.

Assignment 3.2: Examine your laptop

-What processor is in your laptop?

My computer has a Ryzen 7 7000 series processor.

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

All Ryzen 7000-series laptop CPUs use the x86-64 Instruction Set Architecture.

-How much RAM is in it?

It has 32 GB of RAM (31.8 GB usable), in my case.

-How much storage does your laptop have?

It has 953 GB.

-Which operating system is running on your laptop?

My Asus Tuff Gaming A15 has Windows 11.

-Approximately how many applications do you have installed?

Around 40.

-Which application do you use the most?

The application I use most is FireFox.

-Can your laptop be charged with what type of plug?

It uses a a round barrel-style connector.

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

My ASUS Tuf Gaming A15 has a charging port, Ethernet port, HDMI, two USB-C ports, two USB-A ports, and a 3.5 mm audio jack.

Assignment 3.3: Power to the laptop

-What is the input voltage?

The input voltage of my laptop's power adapter is usually 100–240 volts.

-What is the output voltage?

The output voltage of the adapter is typically around 19.5 volts.

-How many watts can your power adapter deliver?

My power adapter can deliver about 150 to 200 watts depending on the exact model.

-Is the input voltage AC or DC?

It is AC.

-Is the output voltage AC or DC?

It is DC.

-AC/DC what is that?

AC means alternating current, which changes direction, and DC means direct current, which only flows in one direction.

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

Yes, if the polarity is reversed it can damage the laptop because the electronics are designed to receive power in only one 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.

If I borrow a power adapter that can deliver 50 watts while my laptop only needs 15 watts, nothing bad will happen because the laptop only draws the amount of power it needs.

Assignment 3.4: Build your dream PC

I do not like being unrealistic, although I like high end stuff, I just will not use them to their fullest potential, so it is wasteful.

Even right now I don't use my RTX 4060 GPU and my Ryzen 7 CPU to their full extend too, because just play not that demanding and heavy games. But if I had to choose I would have a lot of space and a crazy monitor. Here I will gather all of that :D .

Ultimate Heavy-Gaming PC Build: No Budget Limit

CPU: AMD Ryzen 7 7800X3D

Reason: I chose this because it is one of the fastest gaming processors available right now. It also has enough power for me to compile code and run virtual machines smoothly without slowing down my system, as I am very traumatized by them :D.

GPU: Nvidia GeForce RTX 4080 Super

Reason: I picked this because it allows me to play almost any game at high quality. It is also the industry standard for programming, so if I ever want to learn game development later, I won't have any issues.

Motherboard: MSI MAG B650 Tomahawk WiFi

Reason: I need a reliable board to connect everything. I like that it has fast built-in WiFi in case I can't use a cable, and it has plenty of USB ports for all my peripherals.

RAM: 64GB DDR5 6000MHz CL30 (G.Skill Trident Z5)

Reason: Programming uses a lot of memory, so I went with 64GB. This ensures I can keep my game, my code editor, a virtual machine, and 50 browser tabs open all at once without my computer freezing.

Primary Storage: 2TB PCIe 4.0 NVMe SSD

Reason: I want my PC to feel instant. This drive makes Windows start immediately, games load in seconds, and my large coding projects open without any delay.

Power Supply: Corsair RM850e

Reason: I need safe and stable power for these expensive parts. It is powerful enough to run the CPU and GPU at full speed without worrying about crashes.

Cooling: Arctic Liquid Freezer III 360 AIO

Reason: Compiling code and gaming makes the CPU hot, so I chose a strong water cooler. It keeps the processor icy cold and runs quietly so the fan noise doesn't distract me while I work.

Case: Lian Li Lancool 216

Reason: I like this case because it comes with huge fans already installed for great airflow. It’s easy to build in and keeps my components cool during long sessions. It is also very clean and fits my aesthetic for pcs.

Monitor: Alienware 34” Curved QD-OLED (AW3423DWF)

Reason: I chose this because the curved screen wraps around my vision, making games feel incredibly beautiful. For coding, the "Ultra-Wide" shape is amazing—it lets me fit three full-sized windows side-by-side (like code, browser, and output) without needing a second monitor.

Keyboard: Razer Huntsman Mini 60% Gaming Keyboard

Reason: I have this one back at home and it is very comfortable and sounds very smooth and is not too loud. It is also very affordable.

Mouse: Logitech G Pro X Superlight 2

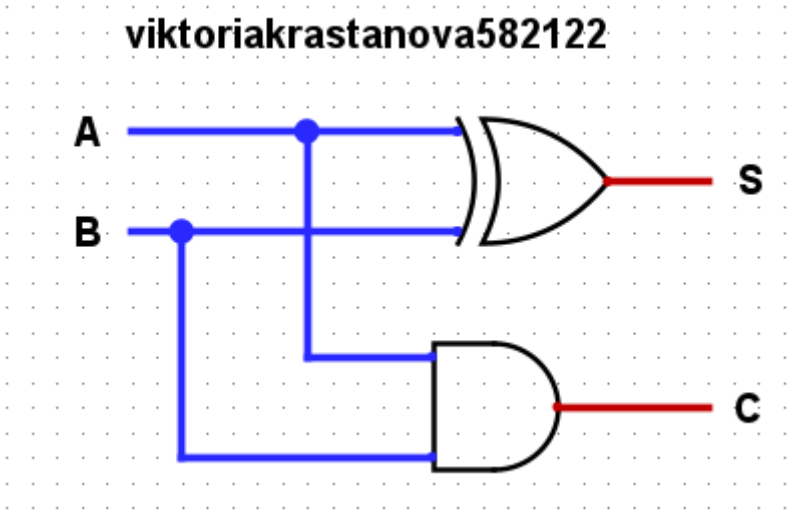
Reason: I wanted something extremely light and accurate. It’s perfect for my competitive gaming, but also comfortable enough to hold for hours while I'm coding. It also is light, to fit my needs for gaming.

Headset: HyperX Cloud Alpha Wireless Reason: I picked this for the 300-hour battery life, I currently have the lower model of the same headphones, they have 100 hour battery life and it is game changing. The sound is also immaculate. I can’t imagine how comfortable it will be to not have to charge for two/ three months.

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.

Half-adder:



Full header: