Template Week 3 – Hardware

Student number:

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Assignment 3.1: Examine your phone

What processor is in your phone? **MediaTek Helio G99**

To which architecture family does this processor belong? In other words, which Instruction Set Architecture (ISA) is used? **ARM architecture**, specifically **ARM Cortex-A76 / ARMv8-A**

How much RAM is in it? **6 GB RAM**

How much storage does your phone have? **128 GB storage**

What operating system is running on your phone? **Android 13**

Approximately how many applications do you have installed? **47 Applications**

Which application do you use the most? **Instagram**

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 port**
>
> **SIM/microSD tray**
>
> **Speaker grille**
>
> **Microphone holes**

Assignment 3.2: Examine your laptop

What processor is in your laptop? **Intel Core i7-9850H**

To which architecture family does this processor belong? In other words, which Instruction Set Architecture (ISA) is used? **AMD 64 (x86-64)**

How much RAM is in it? **32 GB of RAM**

How much storage does your laptop have? **512 GB RAM**

Which operating system is running on your laptop? **Windows 11, 64-bit**

Approximately how many applications do you have installed? **38 Applications**

Which application do you use the most? **Google chrome**

Can your laptop be charged with what type of plug? **Barrel-plug charger (round DC connector)**

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

USB-A ports

USB-C port

HDMI port
Ethernet (RJ-45)

Audio jack (3.5 mm)

SD card reader

Power (DC barrel-plug)

Assignment 3.3: Power to the laptop

What is the input voltage? **100–240 V AC** as input

What is the output voltage? **19 V DC**

How many watts can your power adapter deliver? **65 Watt**

Is the input voltage AC or DC? **AC**

Is the output voltage AC or DC? **DC**

AC/DC what is that?
AC (Alternating Current):
AC is the type of electricity that comes from the wall. The electric current keeps switching direction all the time. It is used for powering houses and buildings and is good for sending electricity over long distances.

DC (Direct Current):
DC is electricity that only flows in one direction. It is used inside electronic devices like laptops, phones, batteries, and USB chargers because it is more stable.

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

Reversing polarity can:

Damage the motherboard

Burn internal components

Stop the laptop from turning on

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.

Answer

Nothing bad will happen. The laptop will work normally.

Even though the borrowed charger can deliver 50 watts, the laptop only uses the amount of power it needs, which is 15 watts. The charger does not "push" 50 watts into the laptop — the laptop "pulls" only 15 watts from the charger.
Since the voltage and polarity are the same as the original charger, it is completely safe to use.

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	$373.62	—	Prime		In stock	$373.62	amazon.com	Buy ✕
CPU Cooler		Corsair iCUE LINK H100i RGB 63.1 CFM Liquid CPU Cooler	$104.99	—	FREE		In stock	$104.99		Buy ✕
Motherboard		MSI MAG B650 TOMAHAWK WIFI ATX AM5 Motherboard	$179.99	—	Prime		In stock	$179.99	amazon.com	Buy ✕
Memory		Corsair Vengeance RGB 32 GB (2 x 16 GB) DDR5-6000 CL36 Memory	$407.99	—	FREE		In stock	$407.99	BEST BUY	Buy ✕
	+ Add Additional Memory									
Storage		Crucial P3 Plus 1 TB M.2-2280 PCIe 4.0 X4 NVME Solid State Drive	$125.75	—	—		In stock	$125.75	amazon.com	Buy ✕
	+ Add Additional Storage									
Video Card		NVIDIA Founders Edition GeForce RTX 4070 12 GB Video Card	$1045.00	—	—		In stock	$1045.00	amazon.com	Buy ✕
	+ Add Another Video Card									
Case		Lian Li Lancool II Mesh ATX Mid Tower Case	—	—	—	—		No Prices Available	—	Buy ✕
Power Supply		Corsair RM750x 750 W 80+ Gold Certified Fully Modular ATX Power Supply	$188.80	—	—		In stock	$188.80	amazon.com	Buy ✕
Operating System		Microsoft Windows 11 Home Retail - Download 64-bit	$129.99	-$5.00 [1]	FREE		In stock	$124.99		Buy ✕
Monitor		Asus TUF Gaming VG28UQL1A 28.0" 3840 x 2160 144 Hz Monitor	$449.00	—	FREE		In stock	$449.00	ASUS	Buy ✕
	+ Add Another Monitor									

I chose these parts to build a fast and reliable dream PC that can handle gaming, school work, and multitasking. The Ryzen 7 7800X3D is one of the best gaming processors, and the Corsair H100i keeps it cool. I picked 32 GB of fast DDR5 RAM and a 1 TB NVMe SSD for quick loading times and smooth performance.

The RTX 4070 gives excellent graphics performance for modern games and creative work. The MSI B650 motherboard is stable and supports all the latest features. I chose the Lian Li Lancool II Mesh case for good airflow, and the Corsair RM750x power supply for efficiency and reliability.

Windows 11 Home works best with new hardware, and the ASUS TUF 144Hz monitor gives a smooth and sharp display. Overall, this build is powerful, future-proof, and perfect for my needs.

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.
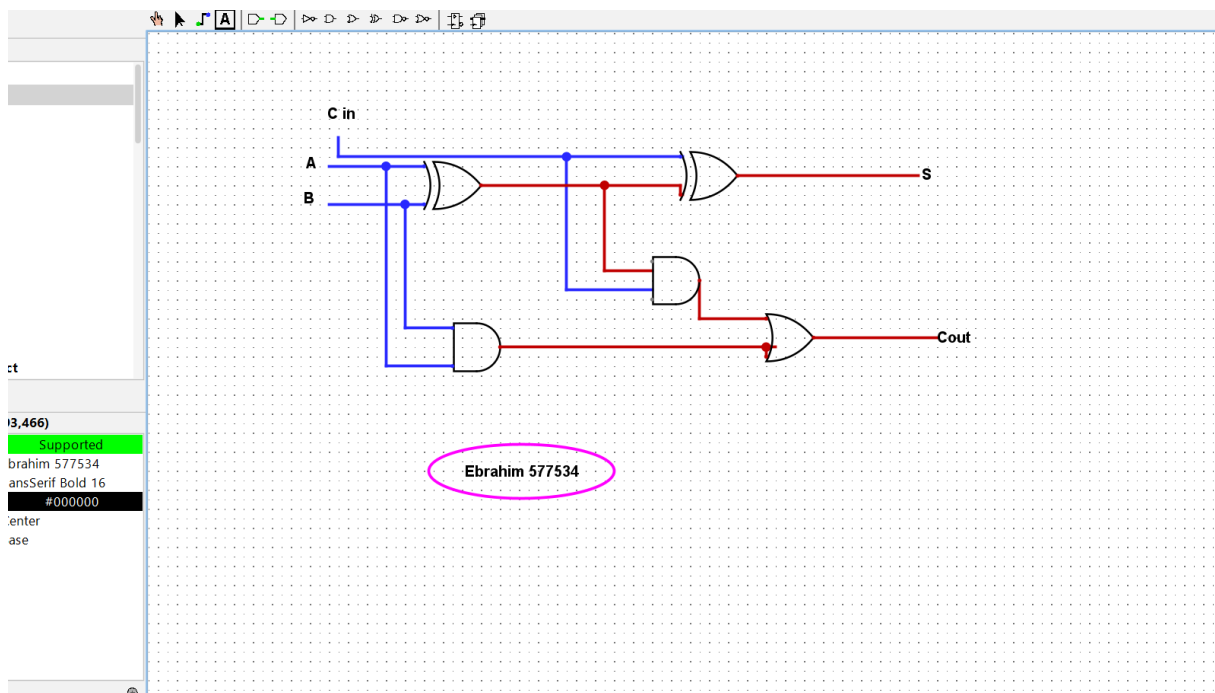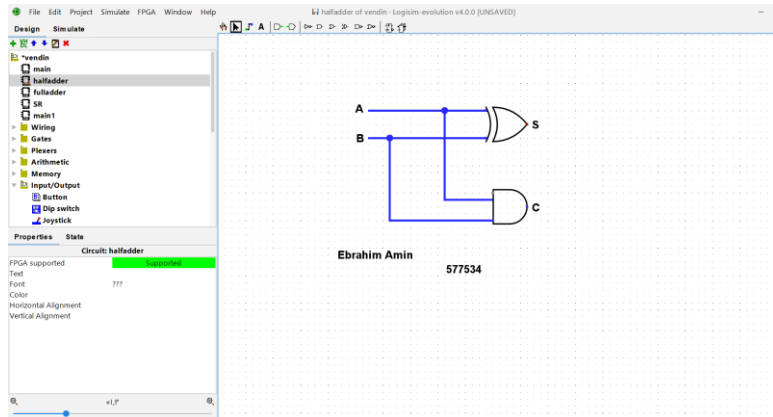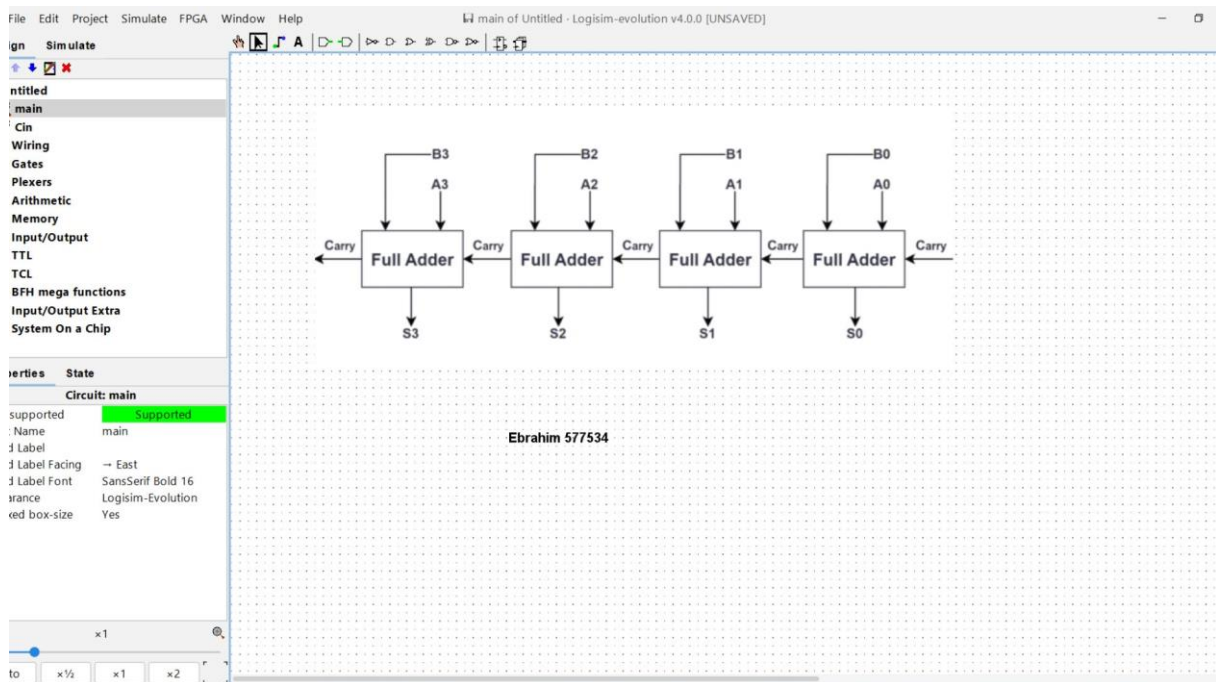
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