Template Week 3 – Hardware

Student number: 593201

Assignment 3.1: Examine your phone

What processor is in your phone?
- Apple A17 Pro

To which architecture family does this processor belong? In other words, which Instruction Set Architecture (ISA) is used?
- **ARM 64-bit**, specifically **ARMv8.6-A** (AArch64; Apple often refers to this as *arm64/ARM64e* in software contexts).

How much RAM is in it?
- 8GB

How much storage does your phone have?
- 512GB

What operating system is running on your phone?
- IOS 26.2

Approximately how many applications do you have installed?
- Around 50 applications installed.

Which application do you use the most?
- Screentime is disabled

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 on the bottom (the only external data/charging port).
- Speaker/microphone grilles (bottom)
- SIM tray on most EU models (US models are eSIM-only).

Assignment 3.2: Examine your laptop

What processor is in your laptop?
- I7-9750H @ 2.60GHz

To which architecture family does this processor belong? In other words, which Instruction Set Architecture (ISA) is used?
- ISA (Instruction Set Architecture): x86-64 (Intel calls it Intel 64; AMD originally introduced it as AMD64)
- It's the 64-bit extension of the x86 (IA-32) family.

How much RAM is in it?
- 16GB RAM

How much storage does your laptop have?
- 512GB SSD NVME

Which operating system is running on your laptop?
- Windows 11 Pro

Approximately how many applications do you have installed?

99 Applications

Which application do you use the most?
- Docker

Can your laptop be charged with what type of plug?
- DC-in plug 5.5mm and 2.5mm inner
- USB(unknown for now) asked the retailer and they said its posible

Which I/O ports can you visually see on your laptop?
- 2X USB 3.0
- 1x HDMI
- 1x USB-C
- 1x USB 2.0
- 2x 3.5-inch audio/mic jack
- 1x RJ-45
- 1x SD-Card slot
- 1x DC-in

Assignment 3.3: Power to the laptop

What is the input voltage?
- INPUT: 100–240V ~ 50–60Hz

What is the output voltage?
- OUTPUT: 19.5V ⎓ 11.8A

How many watts can your power adapter deliver?
- Output: 19.5V and 11.8A
- Watts = 19.5 × 11.8
  = 19.5×10 + 19.5×1.8
  = 195 + 35.1
  = 230.1W ≈ 230W

Is the input voltage AC or DC?
- 100–240V ~ 50–60Hz → AC input

Is the output voltage AC or DC?
- 19.5V ⎓ → DC output

AC/DC what is that?
- AC (Alternating Current): electricity that changes direction many times per second. Wall outlets are AC (in NL usually 230V AC, 50Hz).
- DC (Direct Current): electricity that flows in one direction with fixed polarity (+ and −). Batteries and laptop chargers' output are DC.

If you reverse the polarity of the output voltage, is that bad for your laptop?
- Your laptop expects center-positive (usually) on the barrel plug. Reversing polarity can:
- prevent it from powering on (best case),
- blow a fuse/protection circuit,
- damage the charging circuitry or motherboard (worst case).

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.

It will be fine. The laptop will only draw the power it needs.
- The adapter's 50W is the maximum it can supply, not what it forces into the laptop.
- With the same voltage, the laptop will draw the current required for its load.
- Example: if the laptop needs 15W at 19.5V, the current draw is:
    - $I = P / V = 15 / 19.5 ≈ 0.77A$:
    So it will pull ~0.77A, even though the adapter could supply more.

What could happen in practice:
- Laptop runs normally and charges (if 15W is enough for "running + charging").
- If the laptop sometimes needs more than 15W (gaming/charging fast), it may draw more — up to what the adapter can provide (50W). Still safe.

Assignment 3.4: Build your dream PC

Screenshots PC configuration + motivation:

I chose these parts to build a fast, stable, and future-proof PC with good cooling and upgrade headroom. The Ryzen 7 7700X delivers strong performance for gaming and multitasking. The ASUS ROG STRIX B850-I WiFi provides a modern AM5 platform with reliable components and built-in wireless connectivity. A Corsair 360mm AIO keeps temperatures low and noise down under load. 32 GB DDR5 ensures smooth performance for heavy multitasking and demanding applications. The Samsung 990 PRO 1 TB offers very fast boot and load times. The Lian Li LANCOOL III improves airflow and makes building/upgrading easier. Finally, the Corsair RM1000e 1000W PSU adds stability and plenty of headroom for future GPU upgrades.
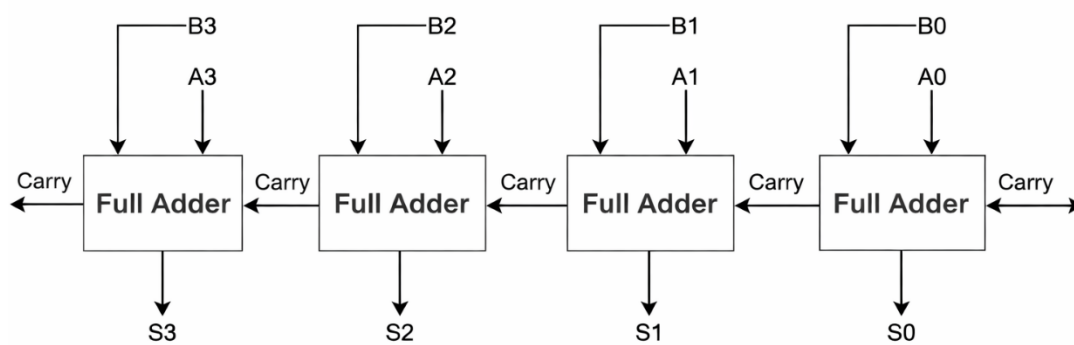
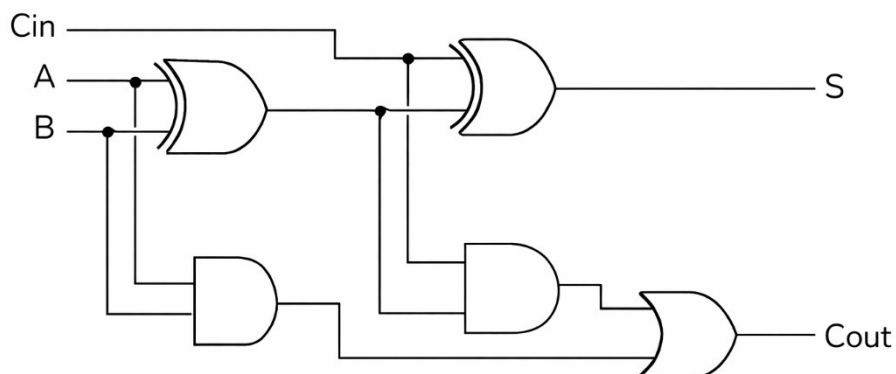| PROCESSOR	
1x AMD Ryzen 7 7700X, 4,5 GHz (5,4 GHz Turbo Boost) socket AM5 processor	€ 239,00
MOEDERBORD	
1x ASUS ROG STRIX B850-I GAMING WIFI socket AM5 moederbord	€ 319,00
PROCESSORKOELER	
1x Corsair NAUTILUS 360 RS ARGB waterkoeling	€ 139,90
WERKGEHEUGEN	
1x G.Skill 32 GB DDR5-5200 Kit werkgeheugen	€ 399,00
SSD	
1x Samsung 990 PRO 1 TB SSD	€ 148,90
BEHUIZING	
1x Lian Li LANCOOL III midi tower behuizing	€ 149,00
VOEDING	
1x Corsair RM1000e (2025) modulaire 1000 watt voeding	€ 139,90

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.

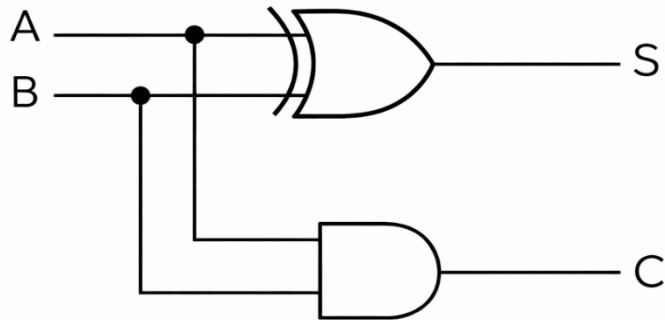Paste the three exported PNG pictures in here.

Dylan Holkenborg 593201

	B3			B2			B1			B0	
	A3			A2			A1			A0	

Carry Full Adder Carry Full Adder Carry Full Adder Carry Full Adder Carry

S3   S2   S1   S0

Dylan Holkenborg 593201

Cin
A
B
S
Cout

Ready? Save this file and export it as a pdf file with the name: **week3.pdf**