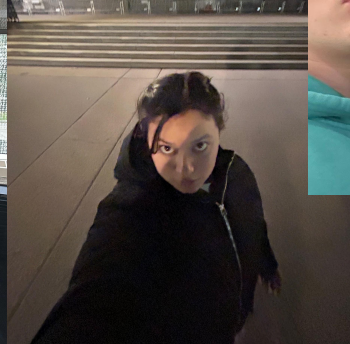


Hardware Security?

Kasey Kiggins

Slide_Display Portmap(name => Slide_Title, personal_info => slide_text)

- Name: Kasey Kiggins
- WiCyS/RITSEC Eboard



Electrical Components

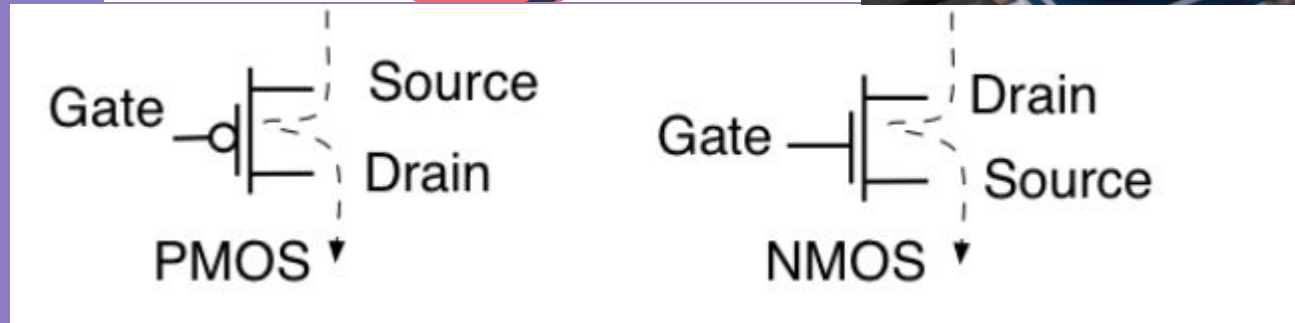
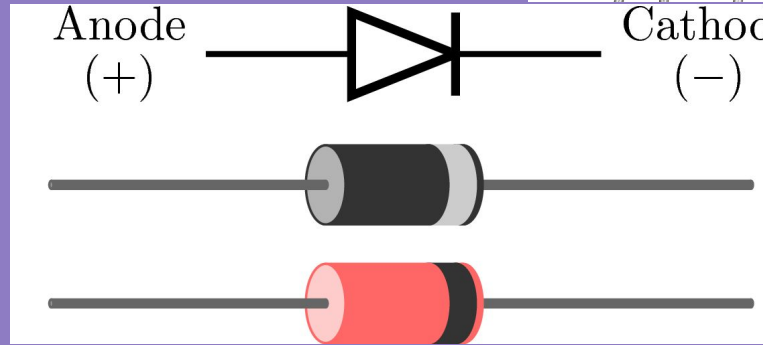
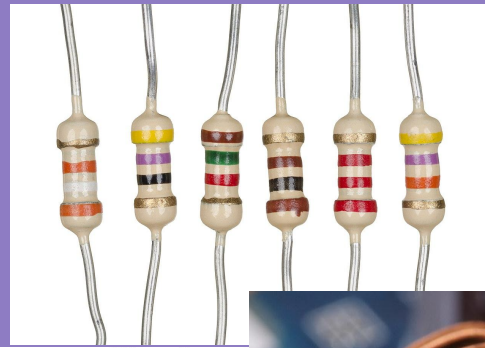
Transistors

Capacitors

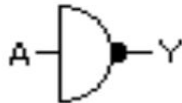
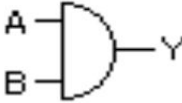
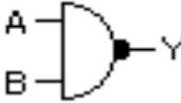
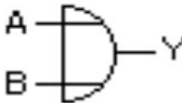
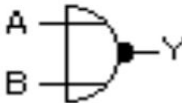
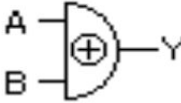
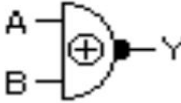
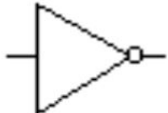




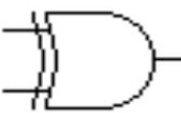
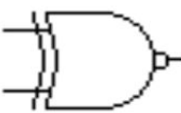
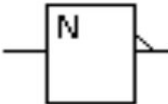
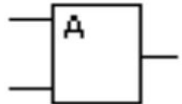
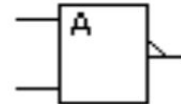




Inductors

Resistors

Diodes



Logic Gates

	INVERT		AND		NAND		OR		NOR		EX - OR		EX - NOR	
European														
American														
IBM ALD's														
Boolean	$Y = \bar{A}$		$Y = A \cdot B$		$Y = \overline{A \cdot B}$		$Y = A + B$		$Y = \overline{A + B}$		$Y = A + B$		$Y = \overline{A + B}$	
Truth Table	A	Y	A B	Y	A B	Y	A B	Y	A B	Y	A B	Y	A B	Y
	L	H	L L	L	L L	H	L L	L	L L	H	L L	L	L L	H
	H	L	H L	L	H L	H	H L	L	H L	L	H L	H	H L	L
			L H	L	L H	H	L H	H	L H	L	L H	H	L H	L
			H H	H	H H	L	H H	H	H H	L	H H	L	H H	H

Making Components

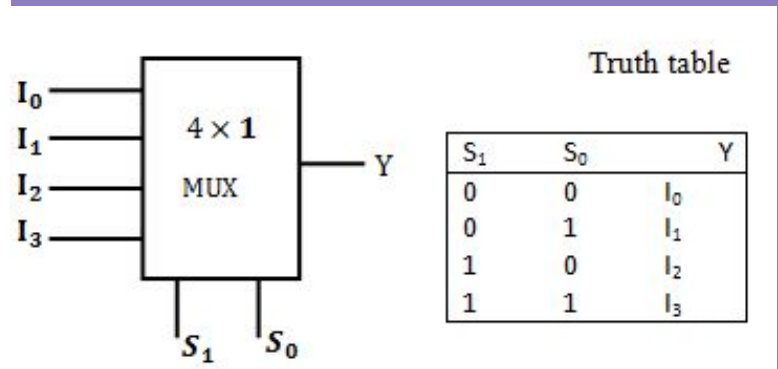
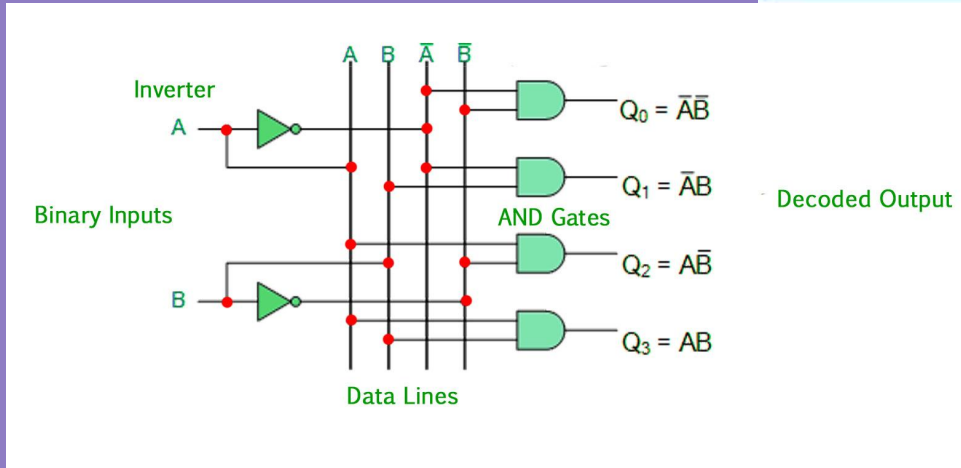
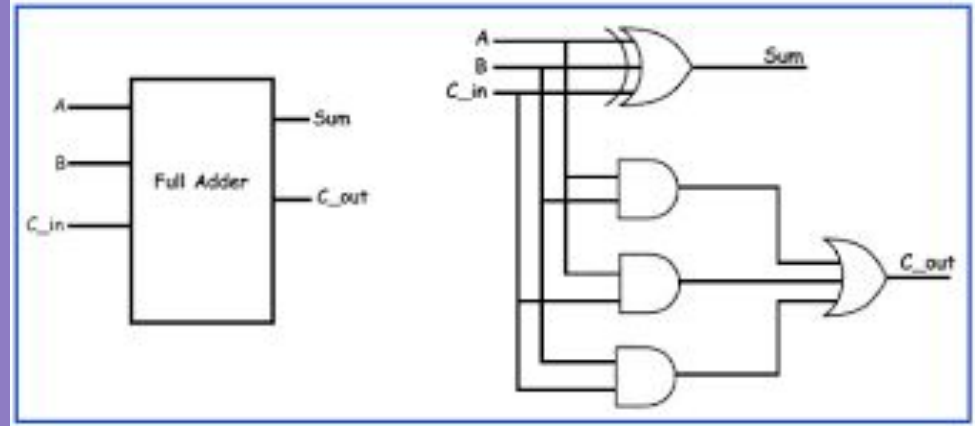
- Hardware description languages
 - Verilog, VHDL
- Similar to a programming language
- Combines components
- Assigns inputs and outputs
- Allows for synthesis of components

Components

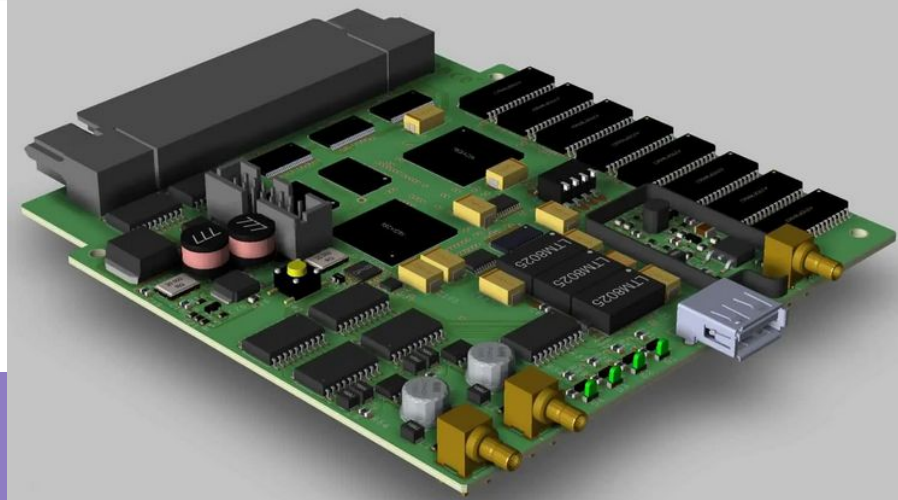
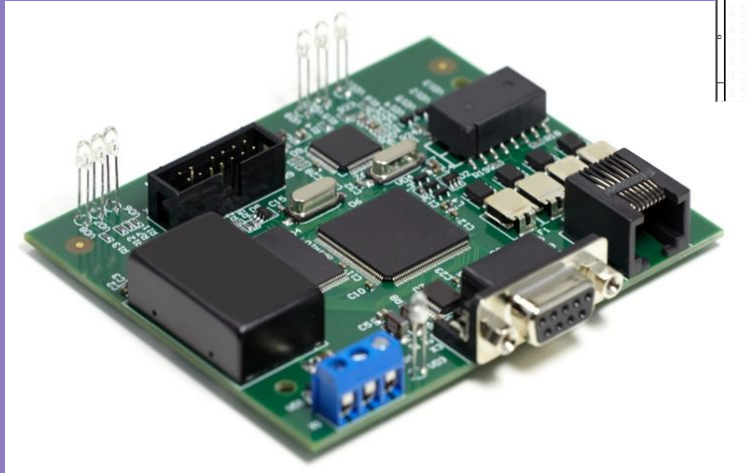
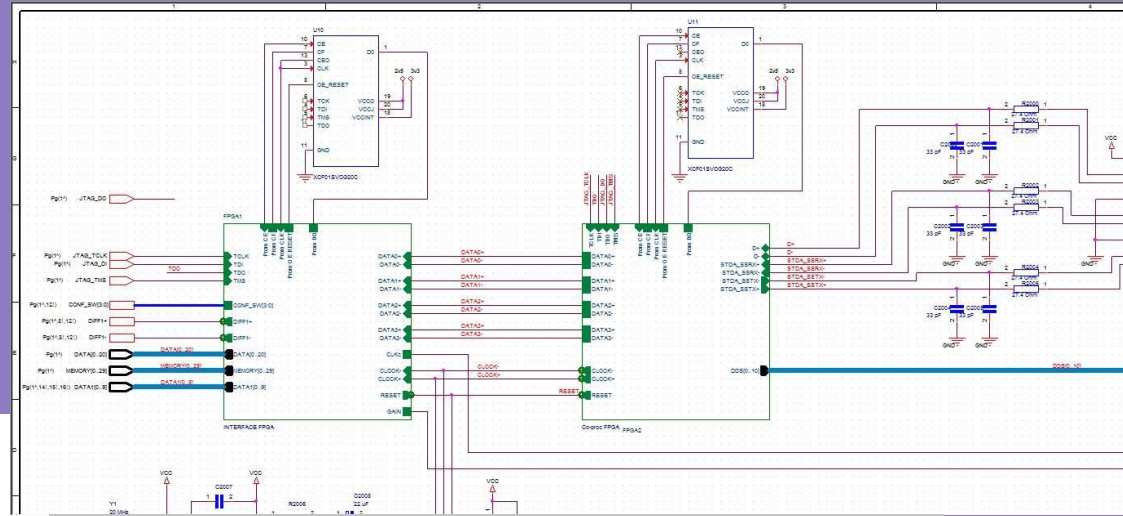
Full Adder

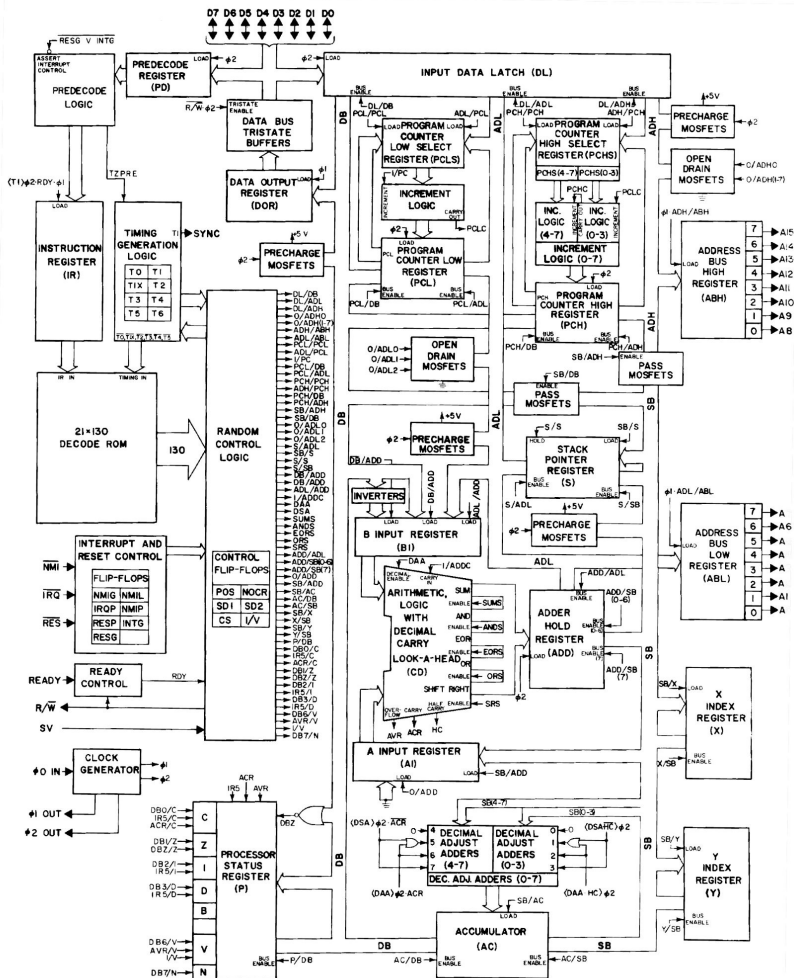
Decoder

Mux



Circuit Boards





So what is hardware?

Hardware

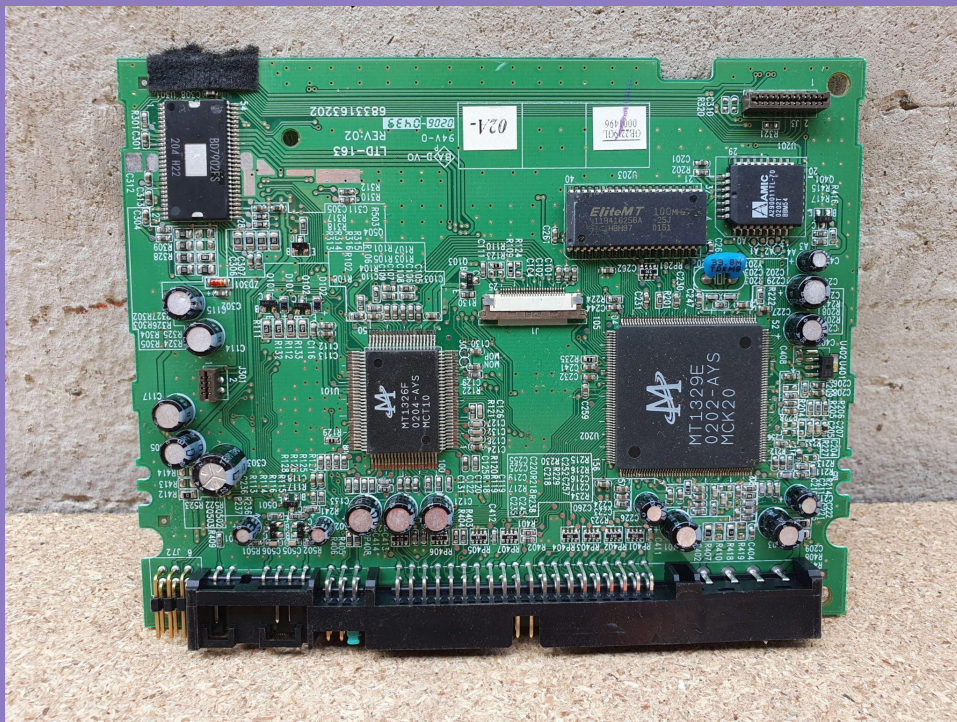
- Physical device
 - Processor
 - Motherboard
 - Power supply
- Not static

Firmware

- Stored read-only memory
- Responsible for booting the system and low-level tasks
- Executed by the processor

I have a device, but what do I do with it?

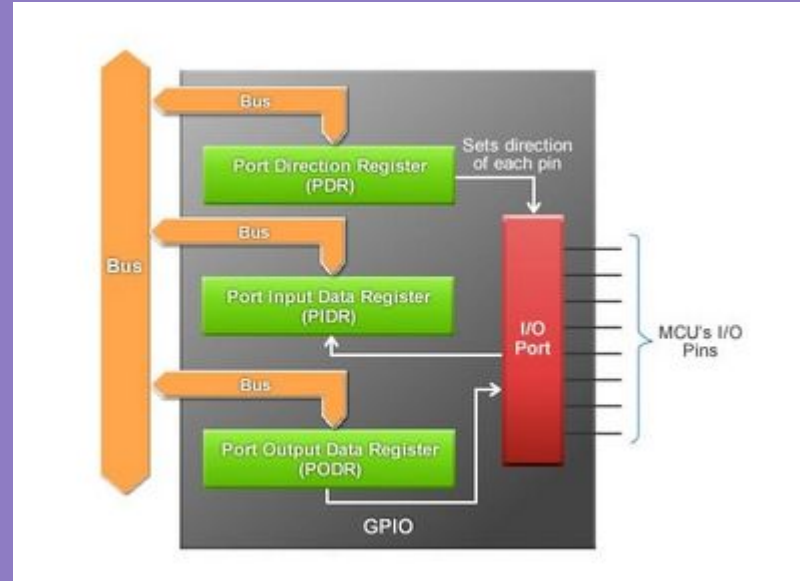
- Read the numbers on the device



GPIO

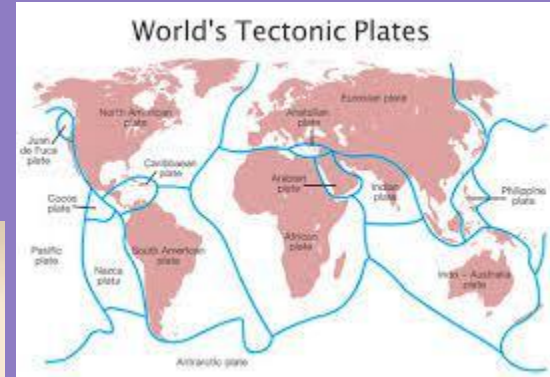
GPIO general purpose input/output

- Communicate to the cpu
- Read calculations



Hardware Attacks

- Fault Injections
- Side Channel Attacks



Hardware Jobs

- Embedded Systems Engineer
- Hardware Security Analyst
- Reverse Engineer
- Electronic Security
- IoT Engineer

Questions?