



5 groups
12 keys/group

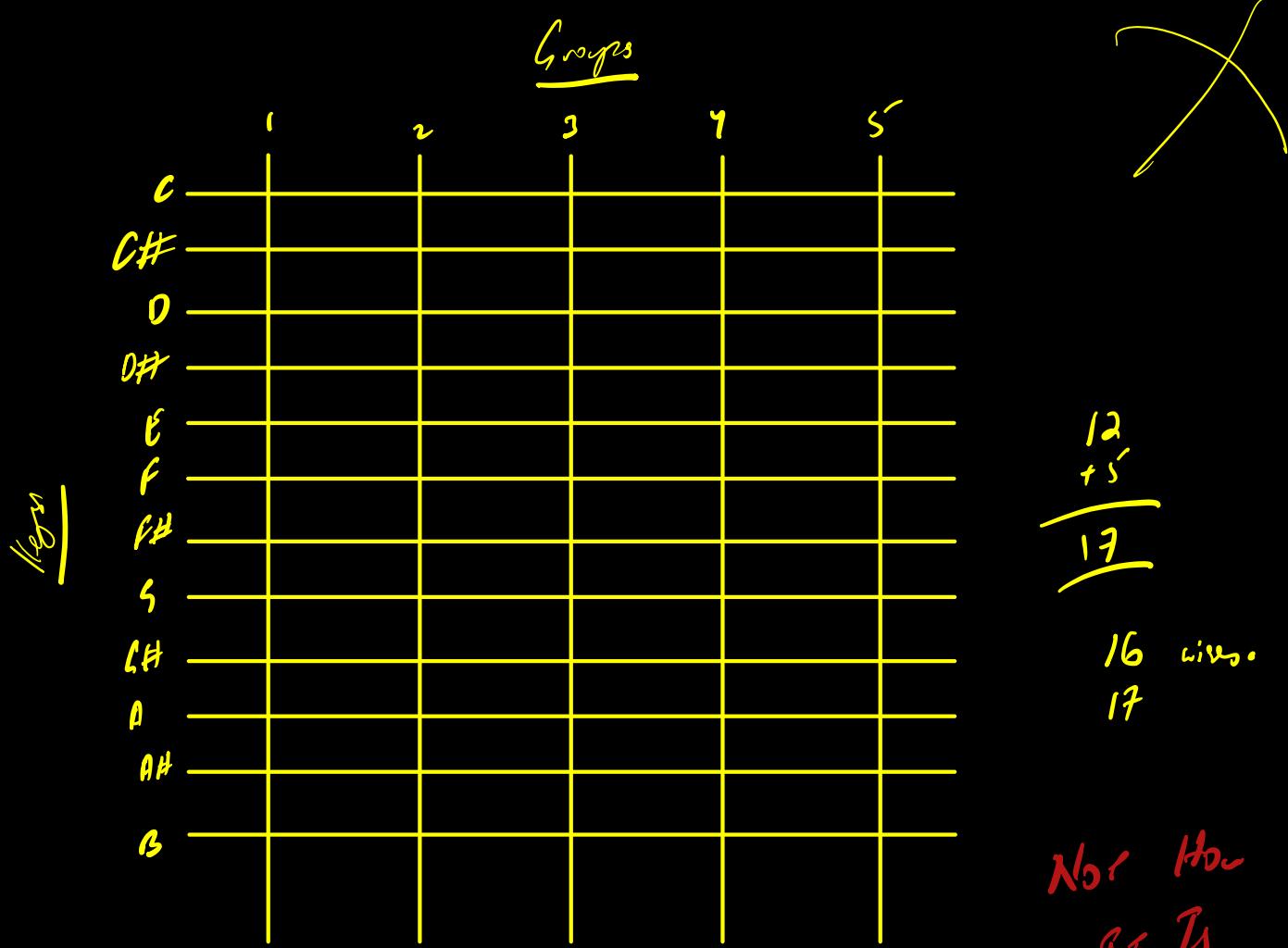
$$12 \times 5 = 60 \text{ keys total}$$

 +1
 61



How to multiplex?

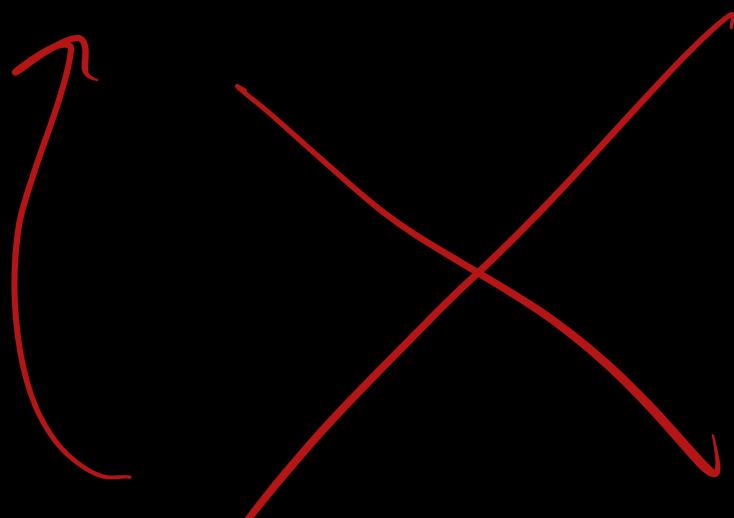




12
+ 5
17
16 wires.
17

Note How
It Is

MAPPED





8×8
16

PULLED UP
INPUT SIGNALS

$5V \rightarrow 1.3V$ when key pressed

→ DO

This is the detected bit.

	1	2	3	4	5	6	7	8
A	c		d		e		f	g
B		a		b	c		d	
C	e		f	g		a		b
D	c		d		e		f	g
E		a		b	c		d	
F	e		f	g		a		b
G	c		d		e		f	g
H		a		b	c	x	x	x

$1.3V \rightarrow 1.1V$
when key
pressed

$\frac{8}{8} \times \frac{8}{16}$ ✓

$$8 \times 8 = 64$$

$$12 \times 5 = 60$$

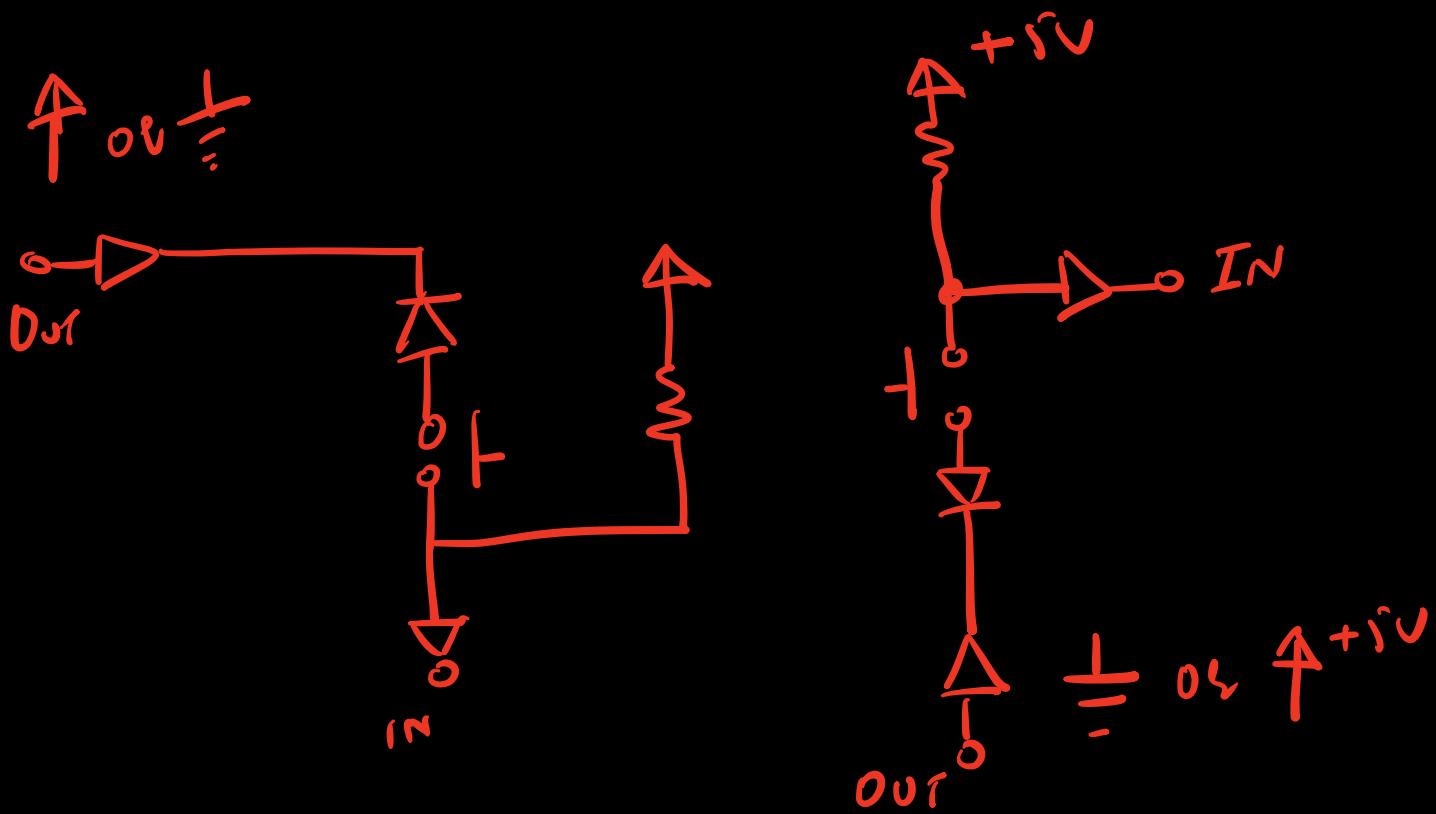
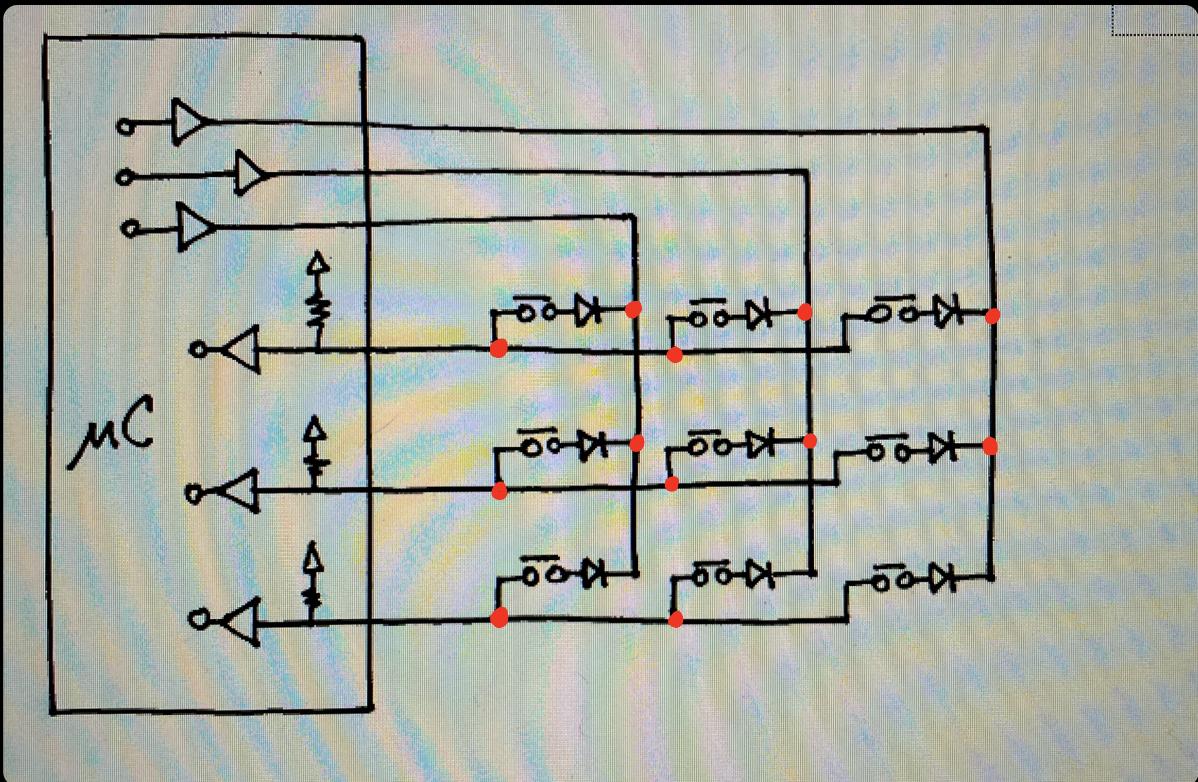
+1 extra C at the end.

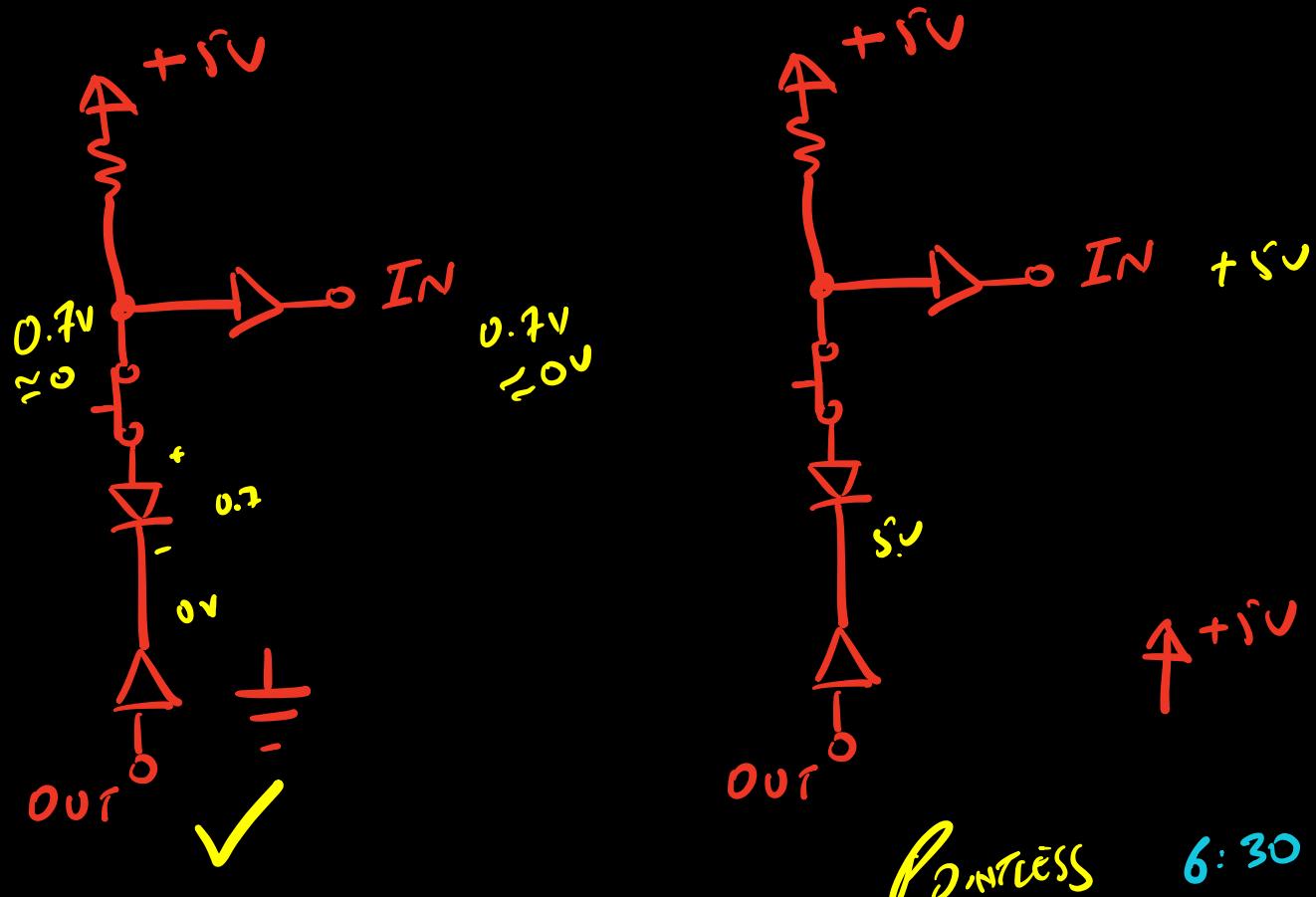
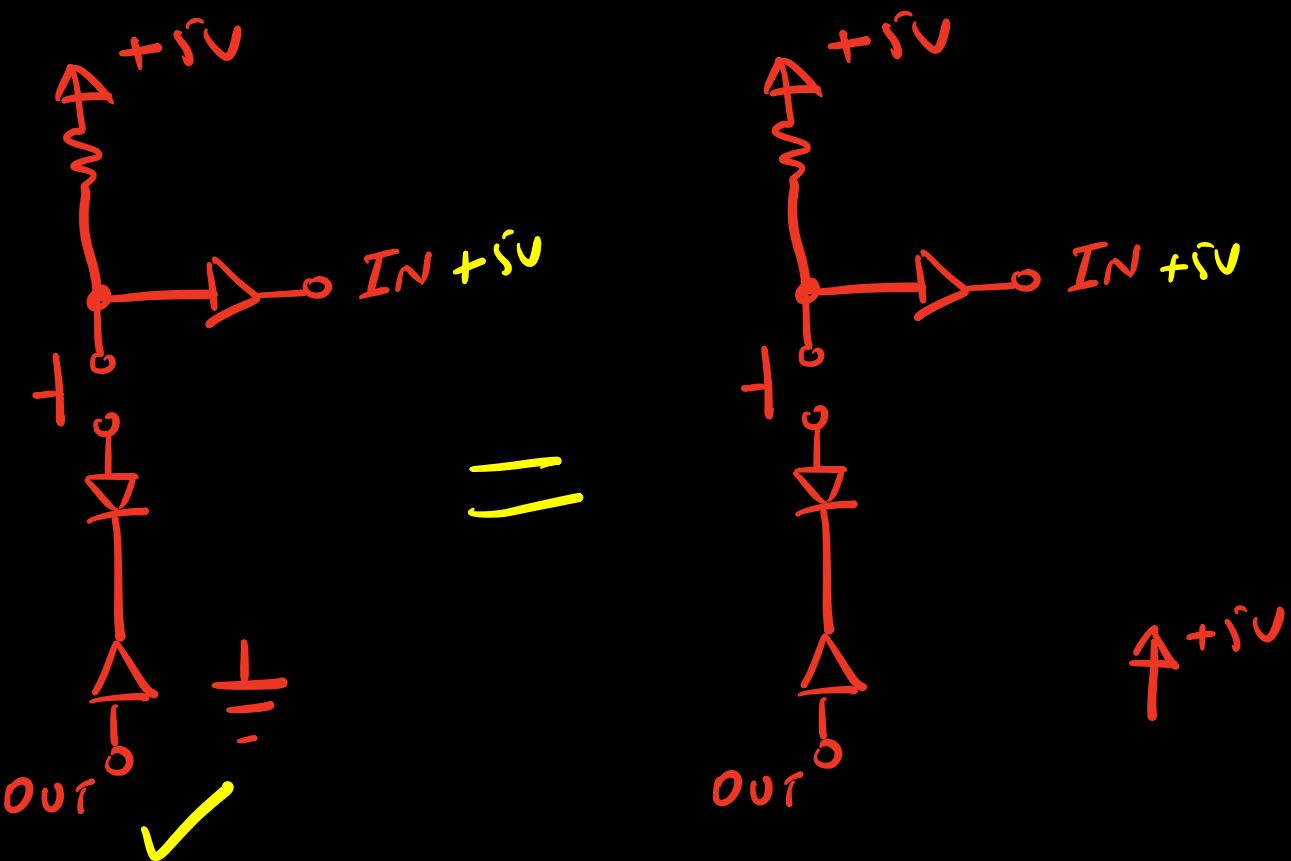
61

3 combos unarrd. ✓



A1	B1	C1	D1	E1	F1	G1	H1
A2	B2	C2	D2	E2	F2	G2	H2
A3	B3	C3	D3	E3	F3	G3	H3
A4	B4	C4	D4	E4	F4	G4	H4
A5	B5	C5	D5	E5	F5	G5	H5
A6	B6	C6	D6	E6	F6	G6	H6
A7	B7	C7	D7	E7	F7	G7	H7
A8	B8	C8	D8	E8	F8	G8	H8

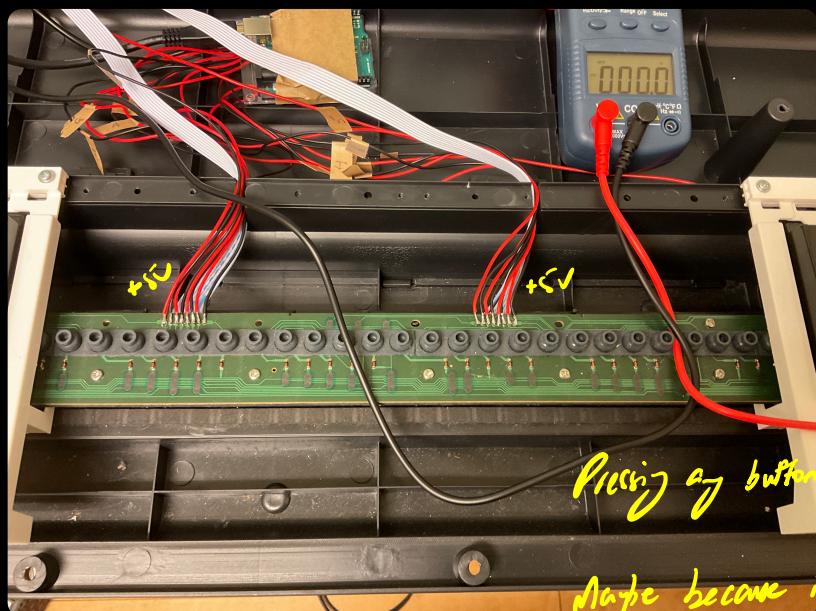
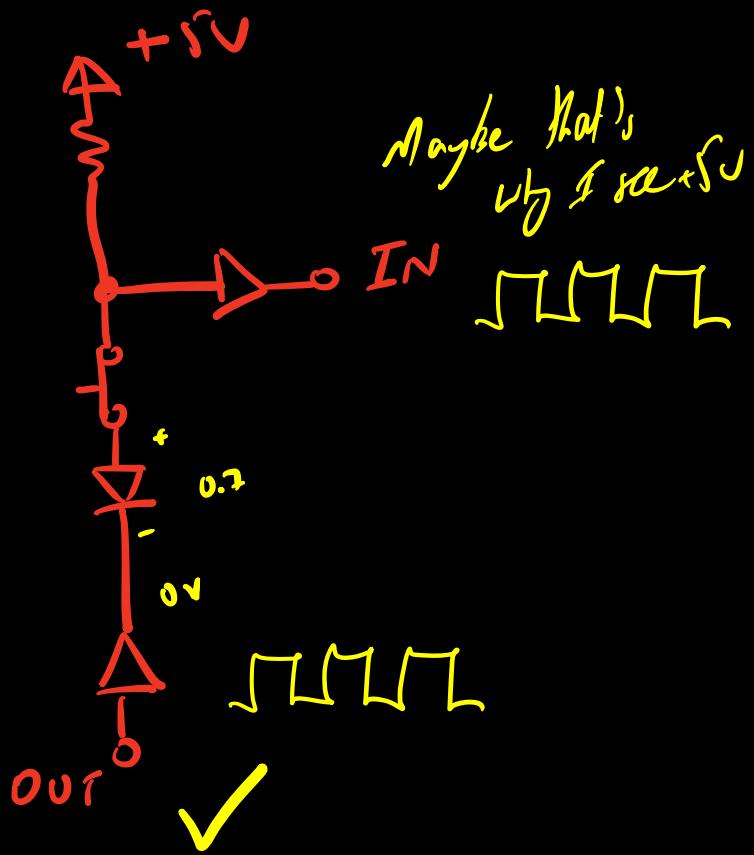
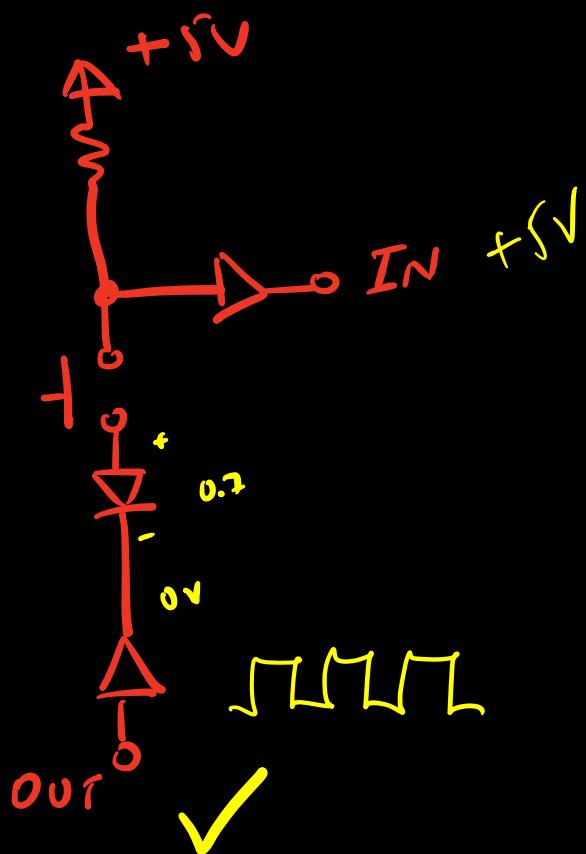




≠ Fullfill $\approx 0V$,
Time To Sleep.

Processor 6:30

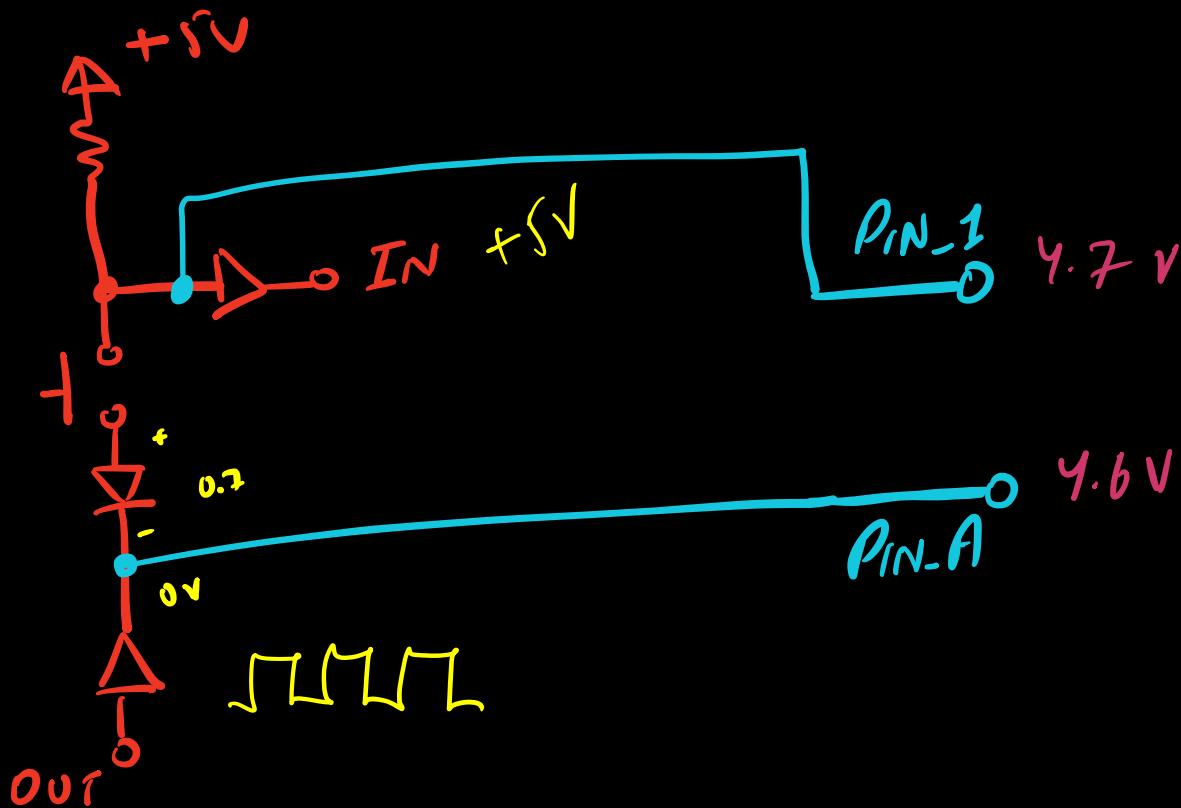
تادے دے بج گئے ہیں۔



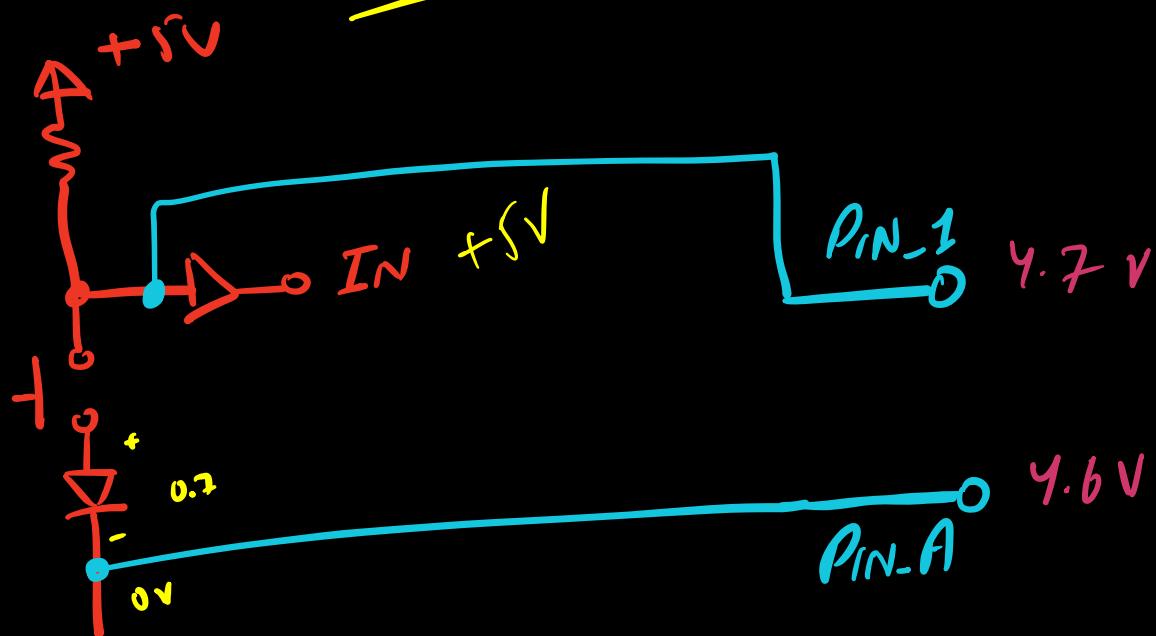
Pressing a button had no effect on the voltage.

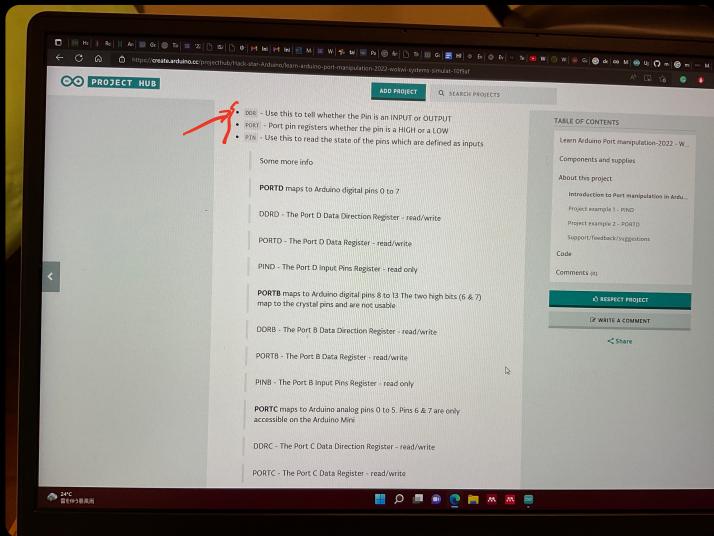
Maybe because its square waves that pass through.
so I just see +5V on the voltmeter.

Surely does work. So, because, correctly +5V with +5V
makes no sense, it has to be a signal that passes.



SOLUTION





A to H are outputs
I to S are input pullups

$$\text{PORTD} = \text{Bin} \left[\underbrace{\text{F}, \text{E}, \text{D}, \text{C}, \text{B}, \text{A}}_{\text{outputs}}, \text{X}, \text{X} \right]$$

✓

Used for MIDI
Serial Communication

$$\text{PORTC} = \text{Bin} \left[\underbrace{\text{X}, \text{X}}_{\text{INACCESSIBLE}}, \text{X}, \text{X}, \underbrace{\text{8}, \text{7}, \text{6}, \text{5}}_{\text{INPUT}} \right]$$

✓

if X

XX XX 1110
XX XX 0001
XX XX 0010
XX XX 1101

$$\text{PORTB} = \text{Bin} \left[\underbrace{\text{X}, \text{X}}_{\text{always high}}, \text{Y}, \text{Z}, \text{2}, \text{1}, \text{H}, \text{G} \right]$$

✓

INPUT INPUT OUTPUT

Used for Clock

Regular Readouts

INPUT_Pullup ✓

PIN B: 00 11 11 00 000000 ✓
 Port[case] Port[case] Port[case]

PIN C: 00 00 11 11 INPUT_Pullup ✓
 Port[case] Port[case] Port[case]

PIN D: 00 00 00 01 Don't Care
 Port[case] Port[case]

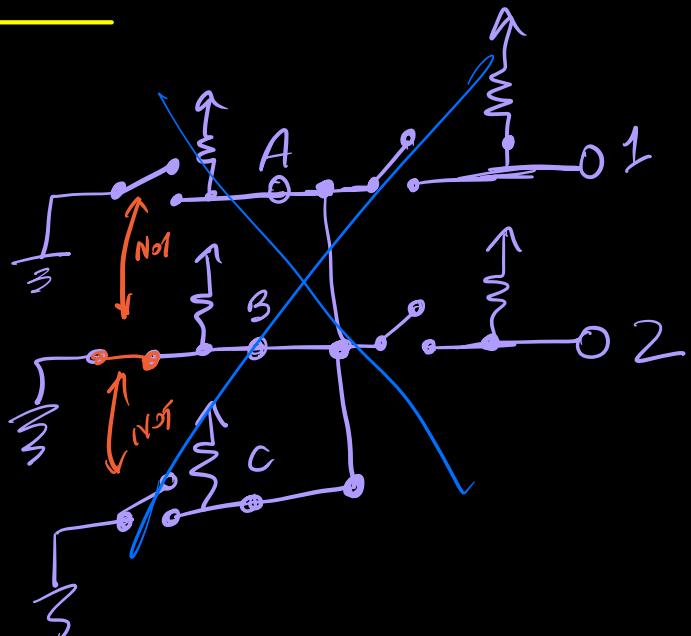
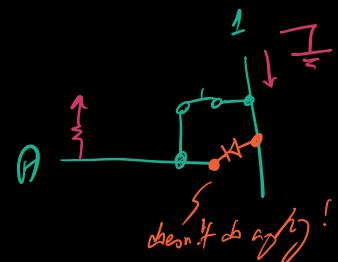
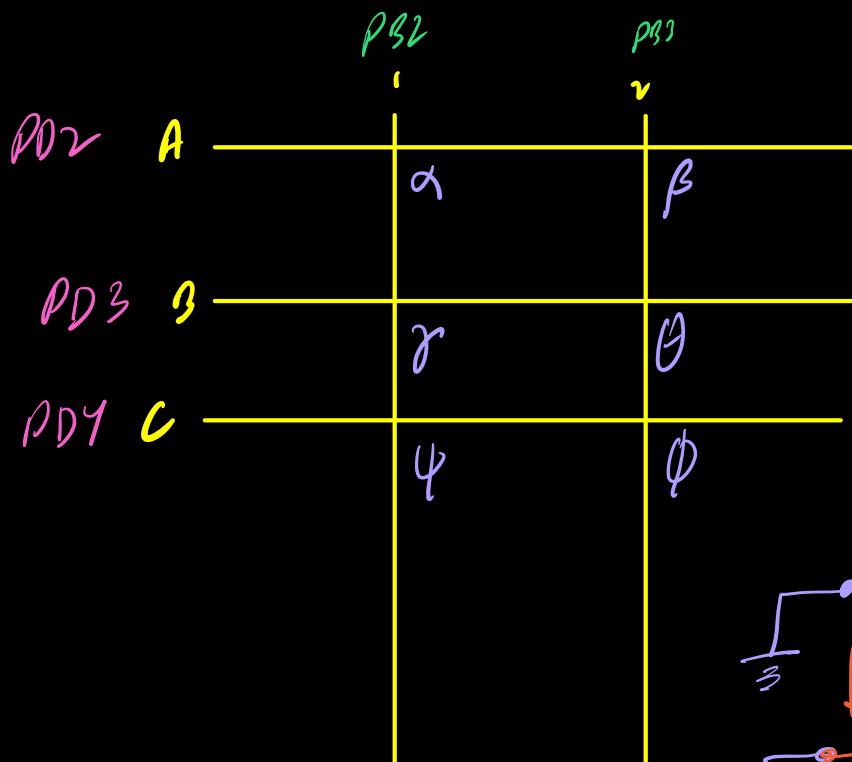
Setup $P_{RD} = P_{RD0}$ | 0b1111 11 00 ^{pass} _{through}

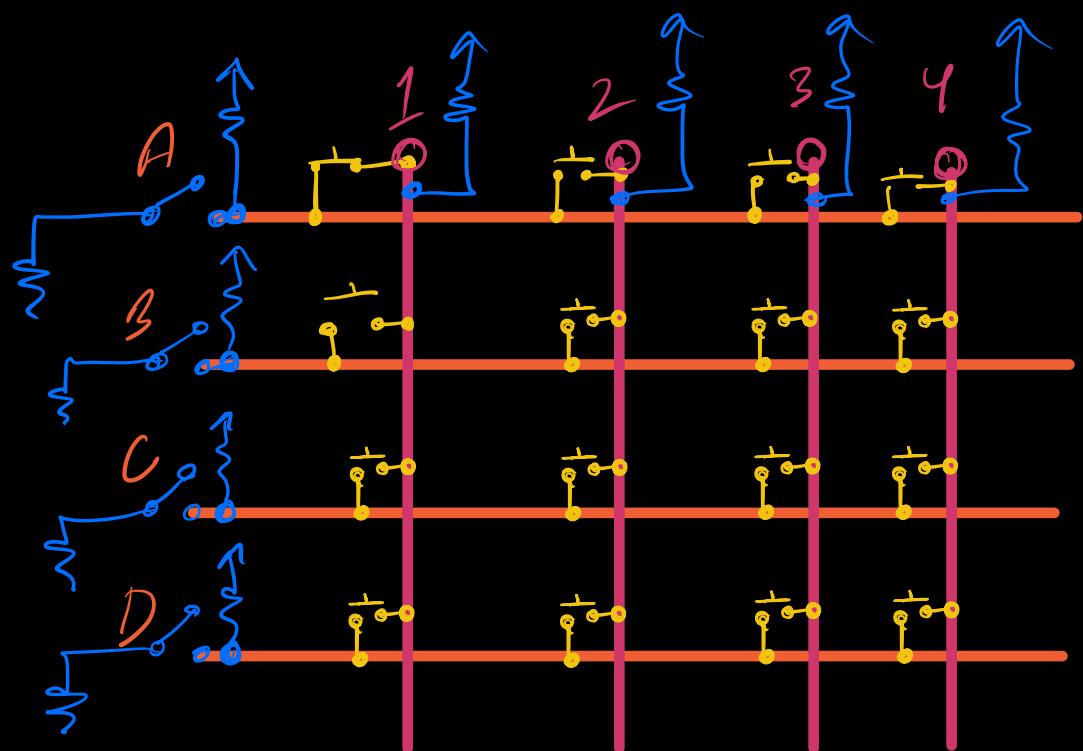
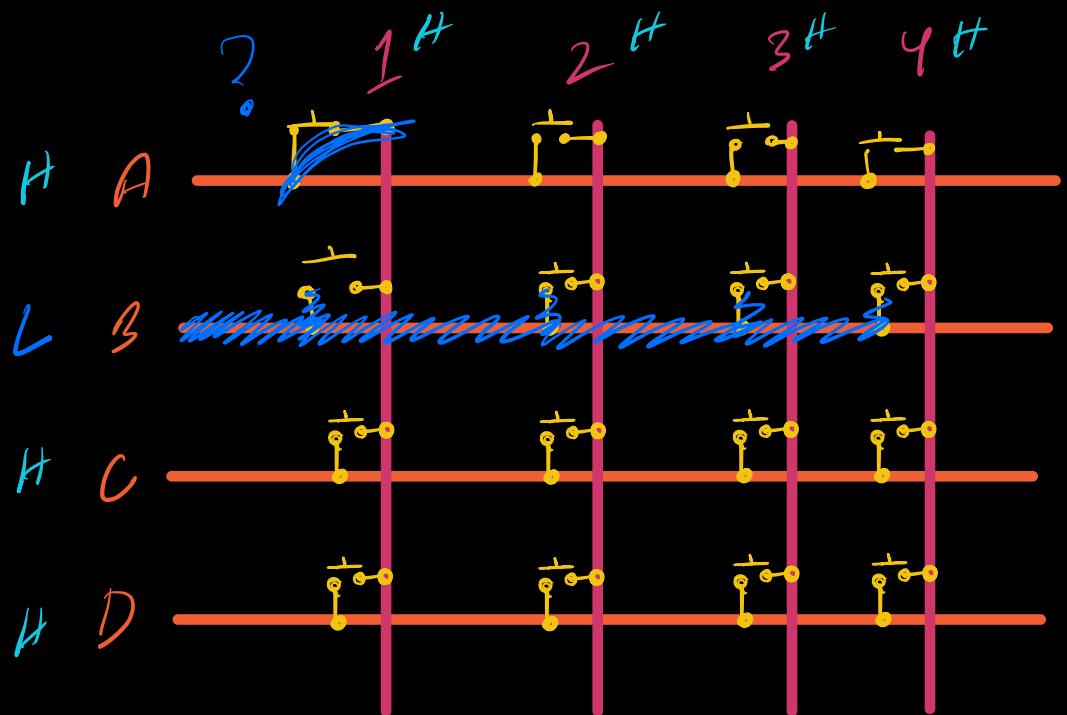
INPUT_Pullup ✓

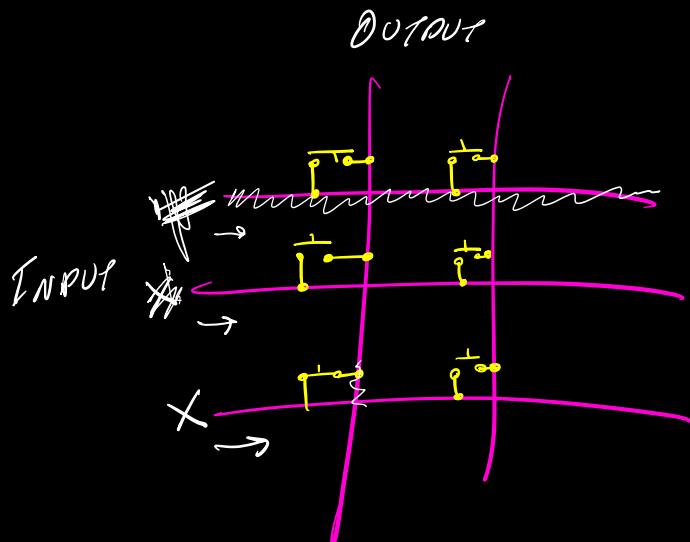
PIN B: 00 11 11 00 000000 ✓
 Port[case] Port[case] Port[case]

PIN C: 00 00 11 11 INPUT_Pullup ✓
 Port[case] Port[case] Port[case]

PIN D: 00 00 00 01 Don't Care
 Port[case] Port[case]







BUTTON STATES

Press = Trigger

Release = Trigger

Pressed = calculate.

$$\begin{aligned} & (\text{PIN D} \& 0x1C) \text{ XOR} \\ & (\text{PIN B} \& 0x03) \end{aligned}$$



I decided not to simply read the signals in the keyboard.

For some reason

HAT kept being detected.

$$\text{PORTC} = \text{B11}\left\{ \underline{\underline{X}}, \underline{\alpha}, X, X, \underbrace{8, 7, 6, 8}_{\text{INPUT}} \right\}$$

INACCESSIBLE

if α

I only need the MIDI array.

If I need to sell the keyboard, I'll just remove the Arduino.

To get the keyboard to work normal either

1) Remove Arduino

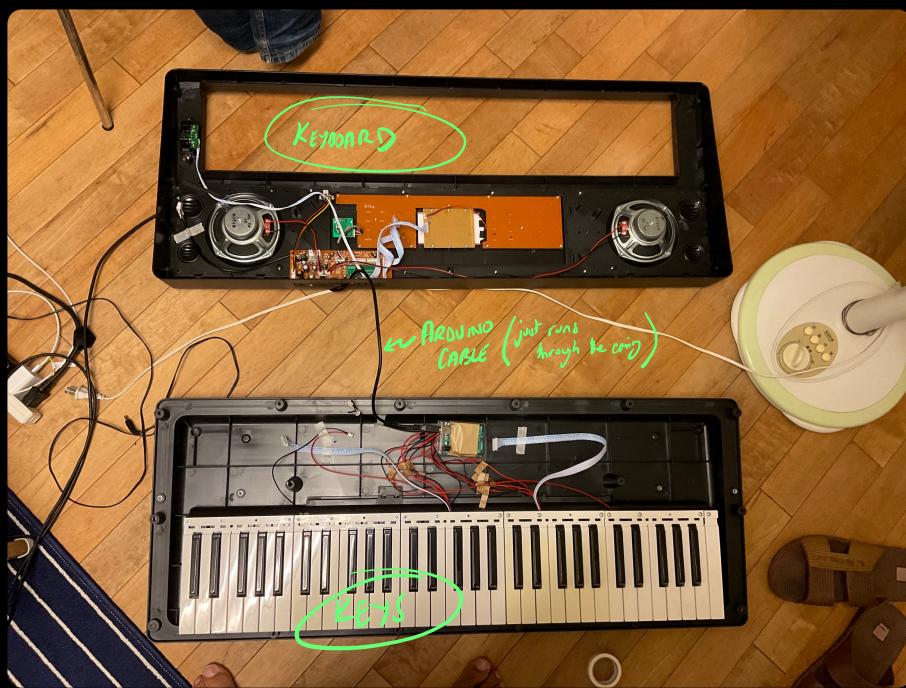
2) Connect Arduino S_V GND to the keyboards' S_G code so Arduino has no output.

Right now every~~b~~ that connects the keys to
the keyboard circuitry is unplugged.

Powering the keyboard does power up the screen &
stuff but is isolated from keys.

Maybe in the future, if I feel like it,
I'll try to figure ~~it~~ out.

Set MIDI & keyboard to
work together.



WORKIN'!

✓

