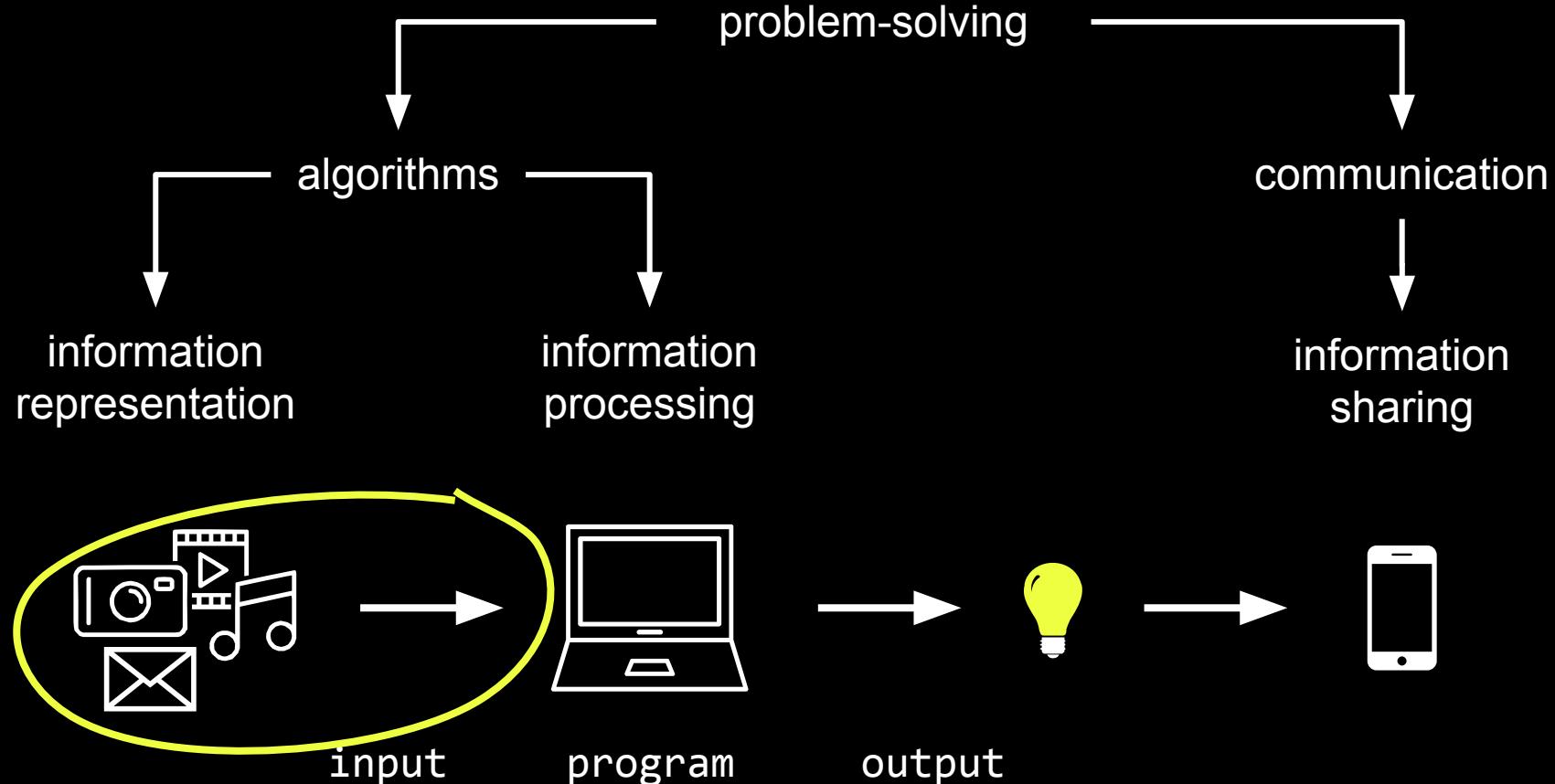


# ANALOG VS. DIGITAL

[BACK](#)



where can you stand on each side?



where can you stand on each side?



# where can you stand on each side?



# where can you stand on each side?



# where can you stand on each side?

CONTINUOUS

any level is  
possible



DISCRETE

only four  
different levels

4

3

2

1

# analog and digital clocks



Image source: [Wikipedia](#)



Image source: [Wikipedia](#)

“Digitization is the representation of an object, image, sound, document or signal by generating a series of numbers that describe a discrete set of its points or samples”

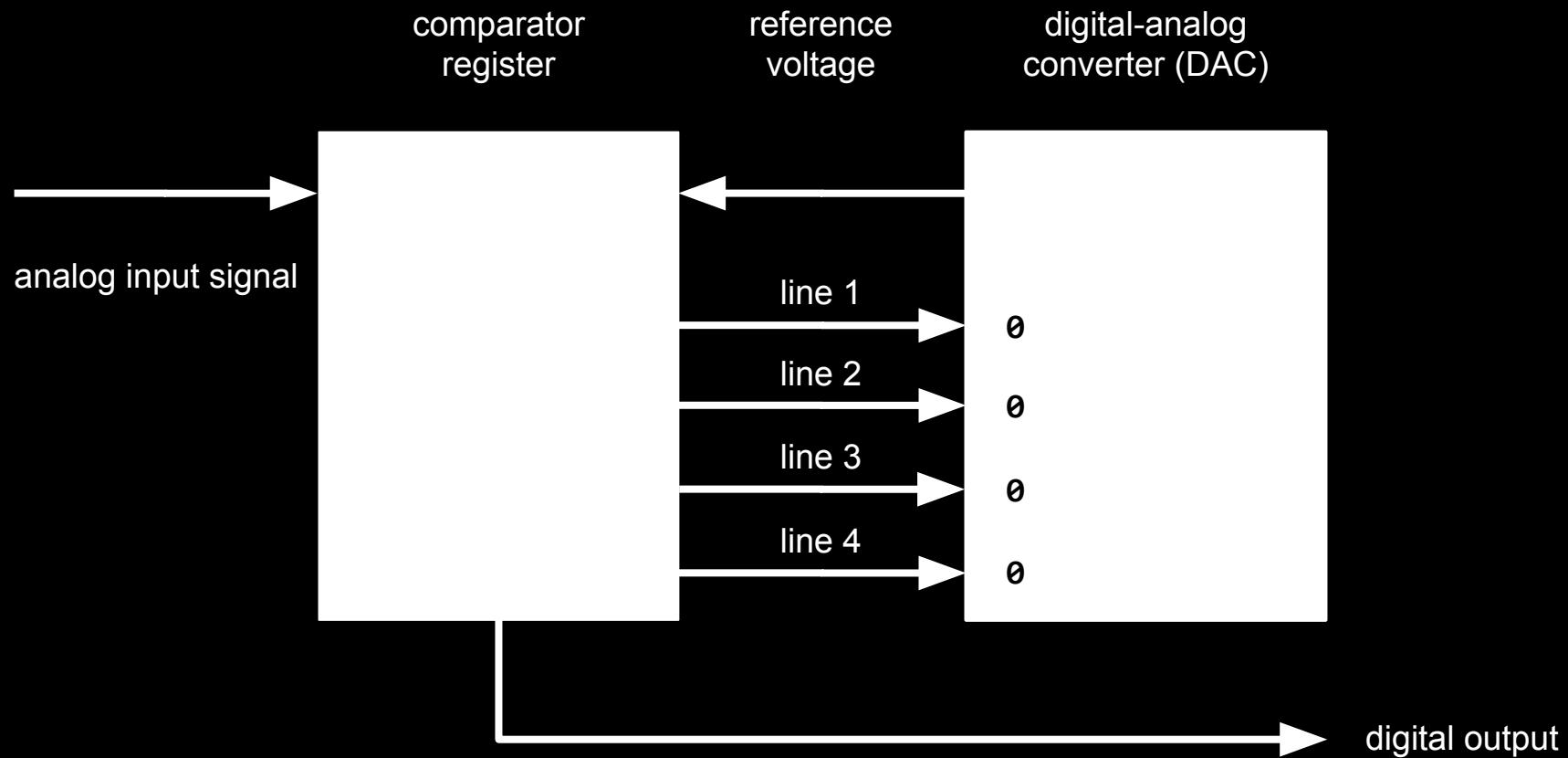
analog-to-digital converter (ADC)

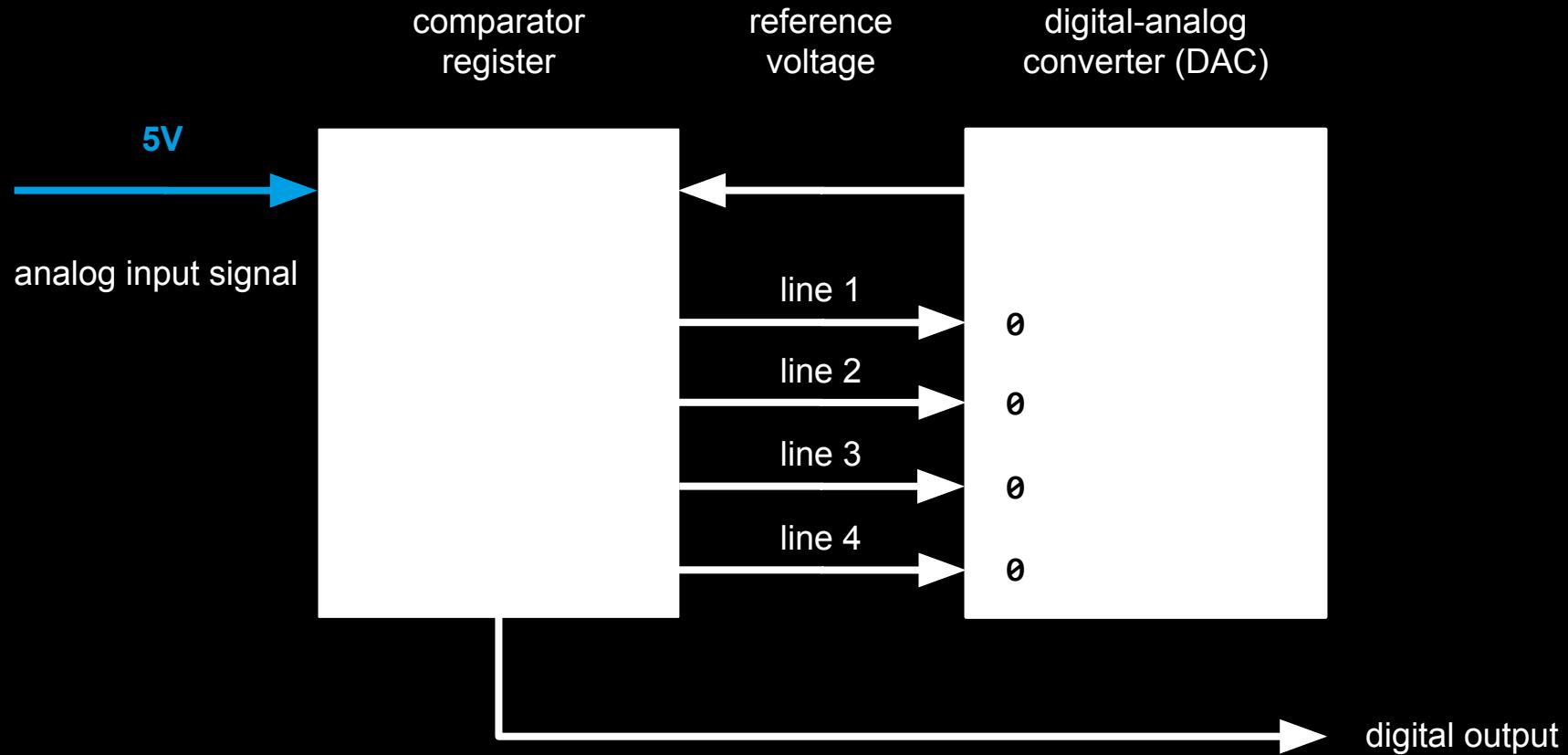


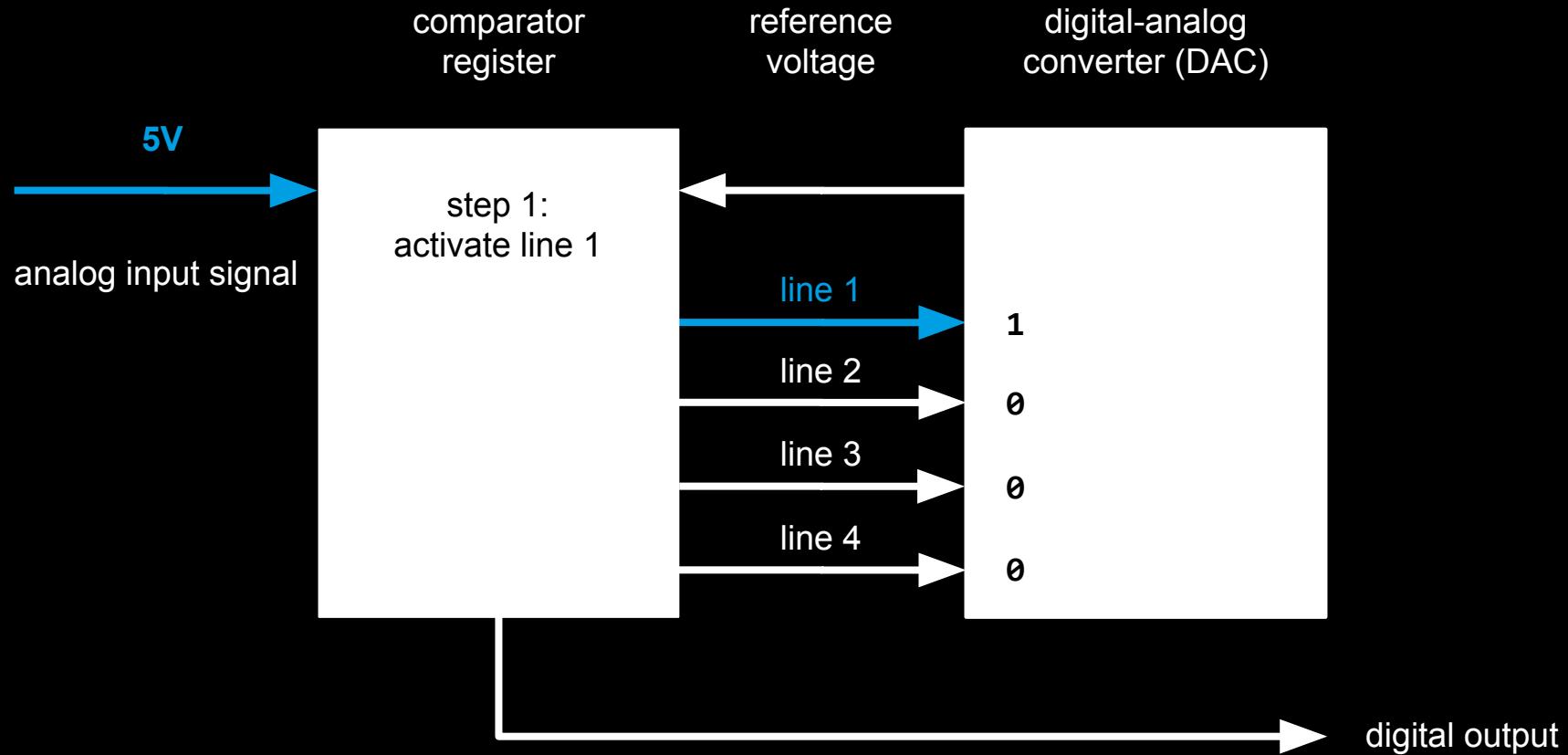
measuring of the  
analog signal

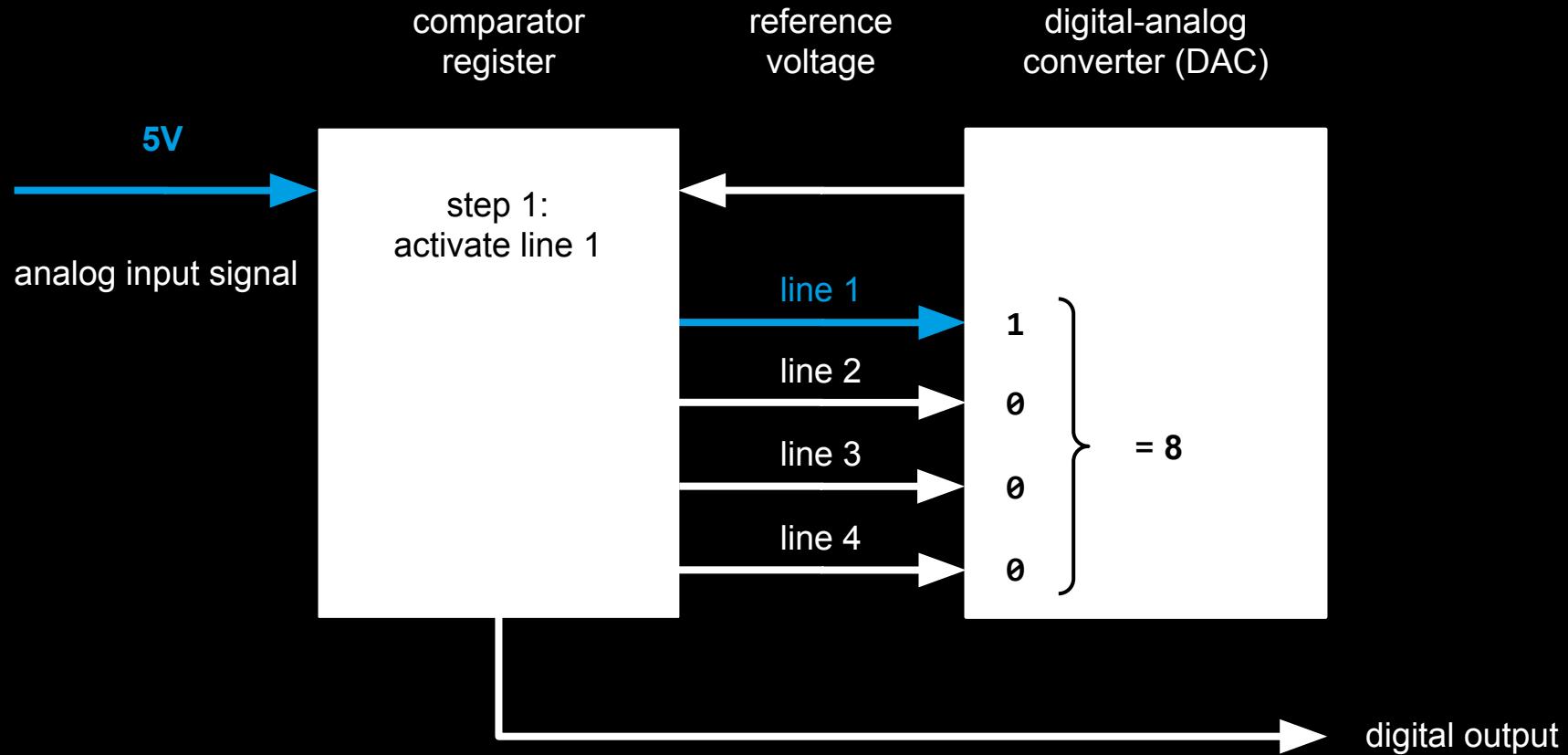
turning the  
measurement into a  
series of 1 and 0

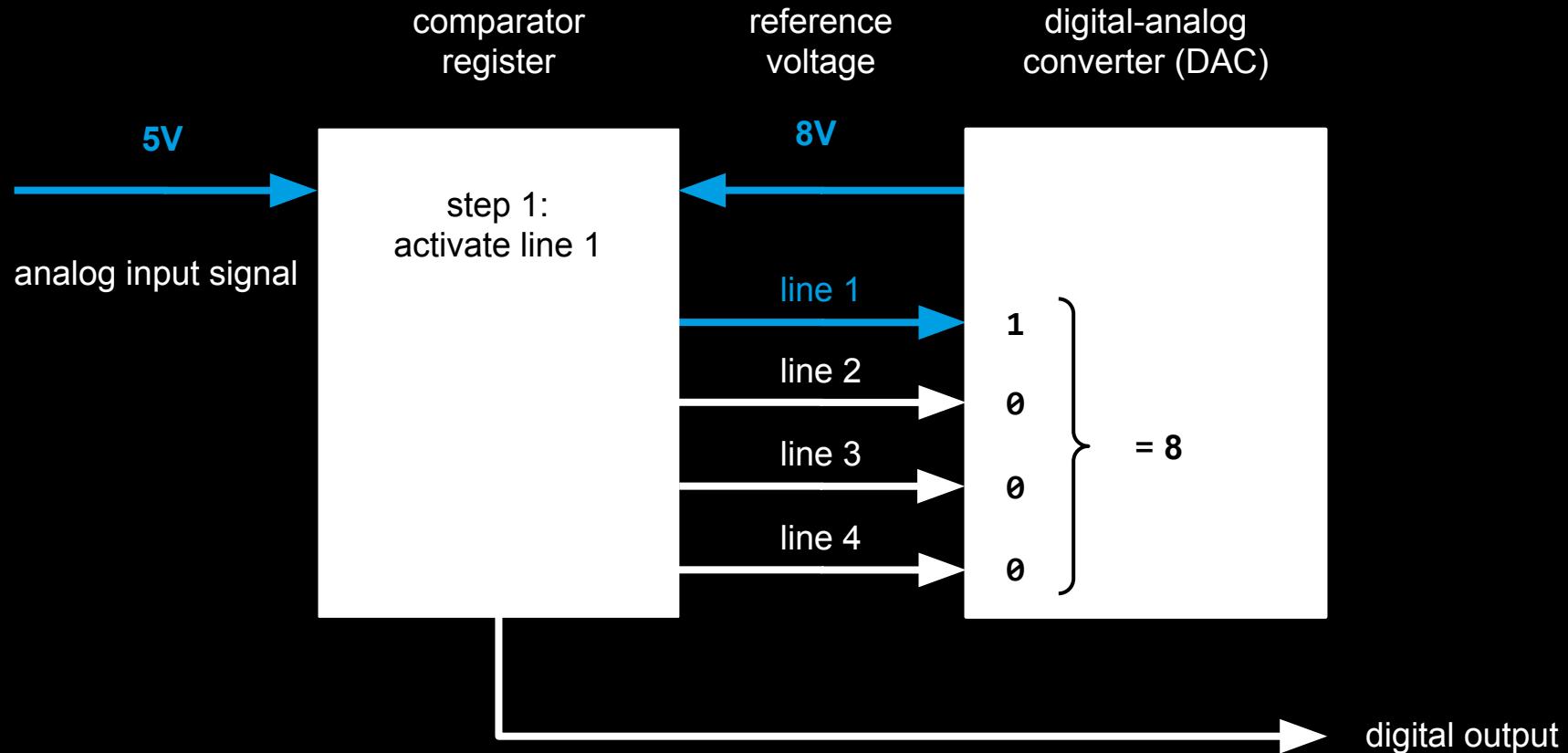
encoding the series of  
numbers in binary  
and assign meaning

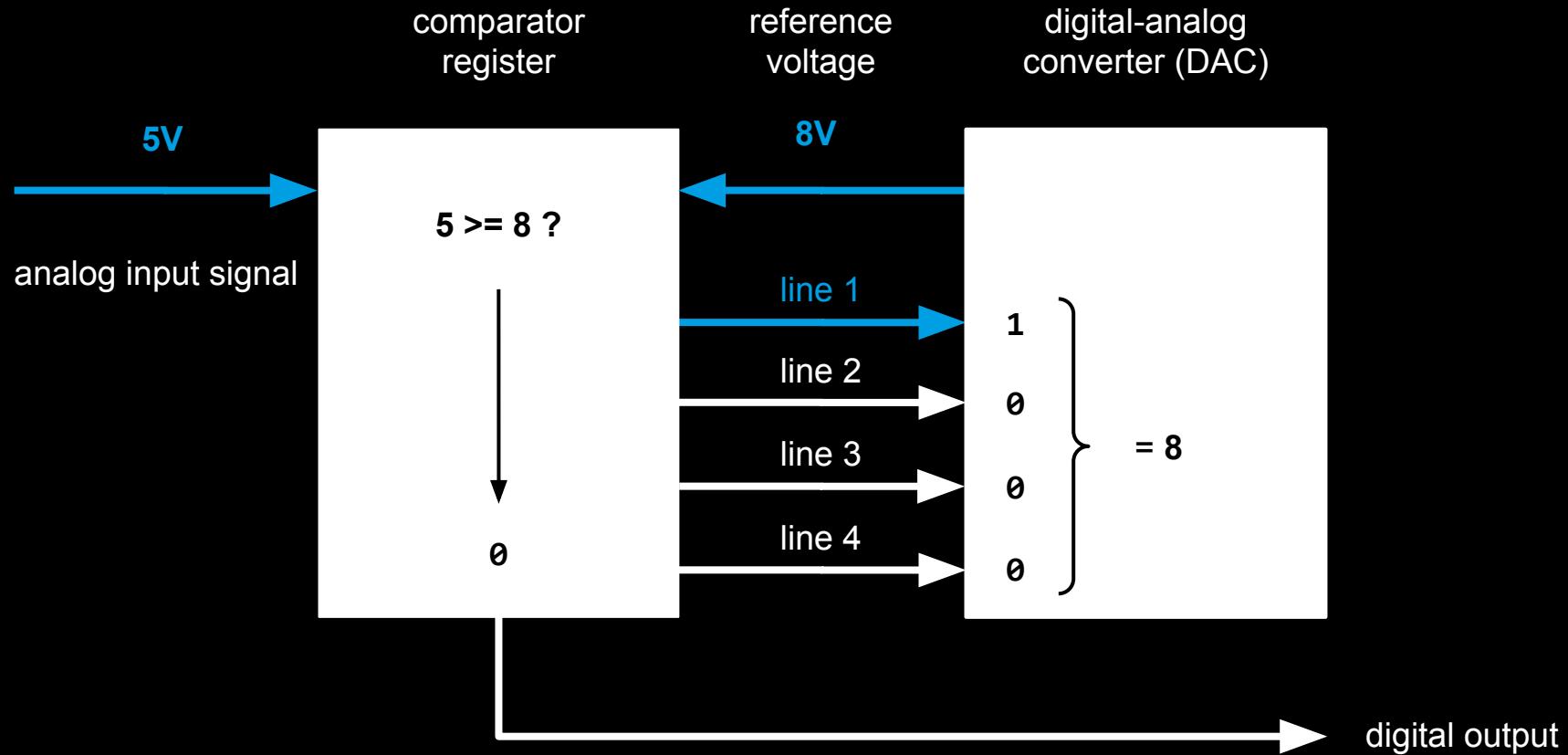


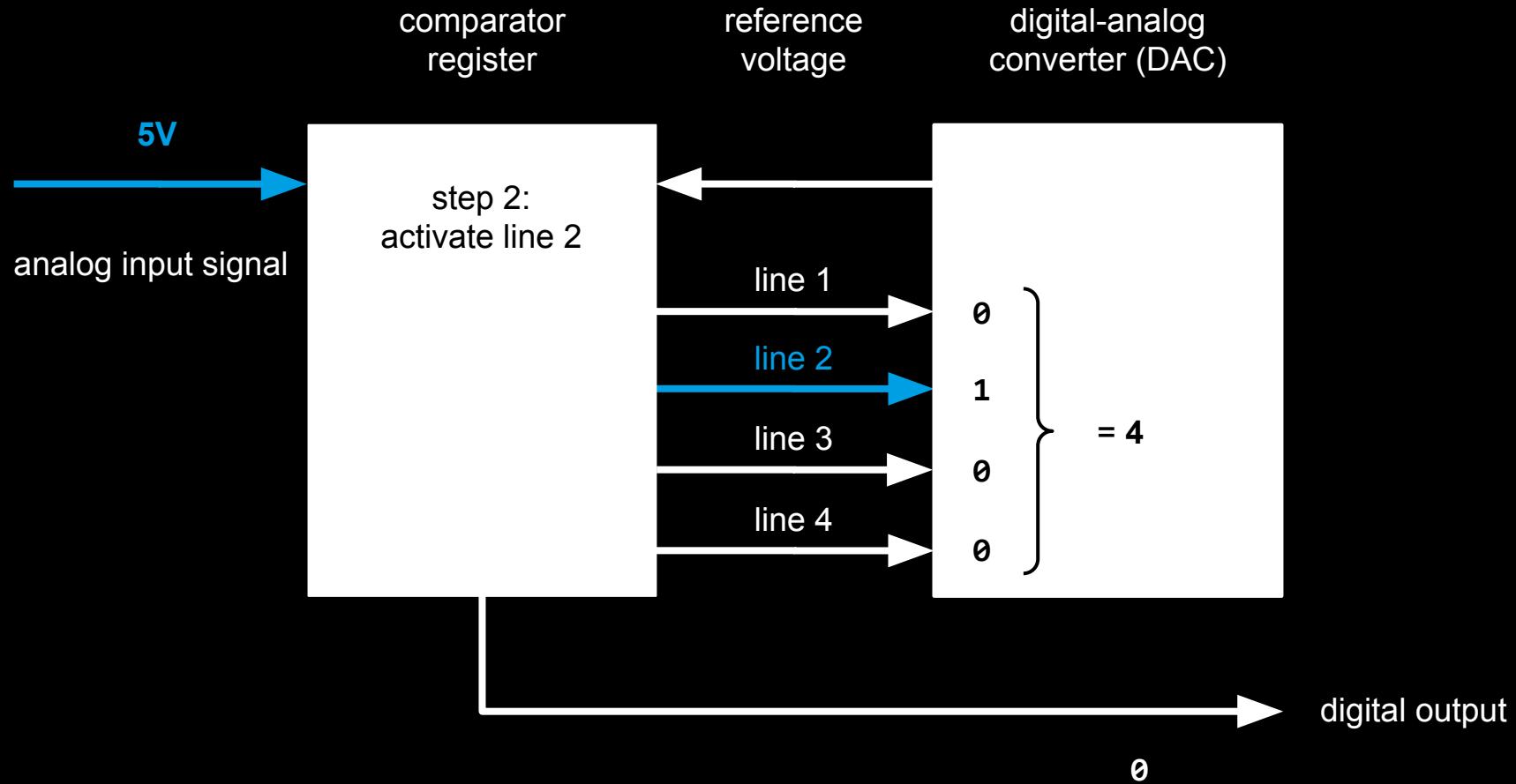


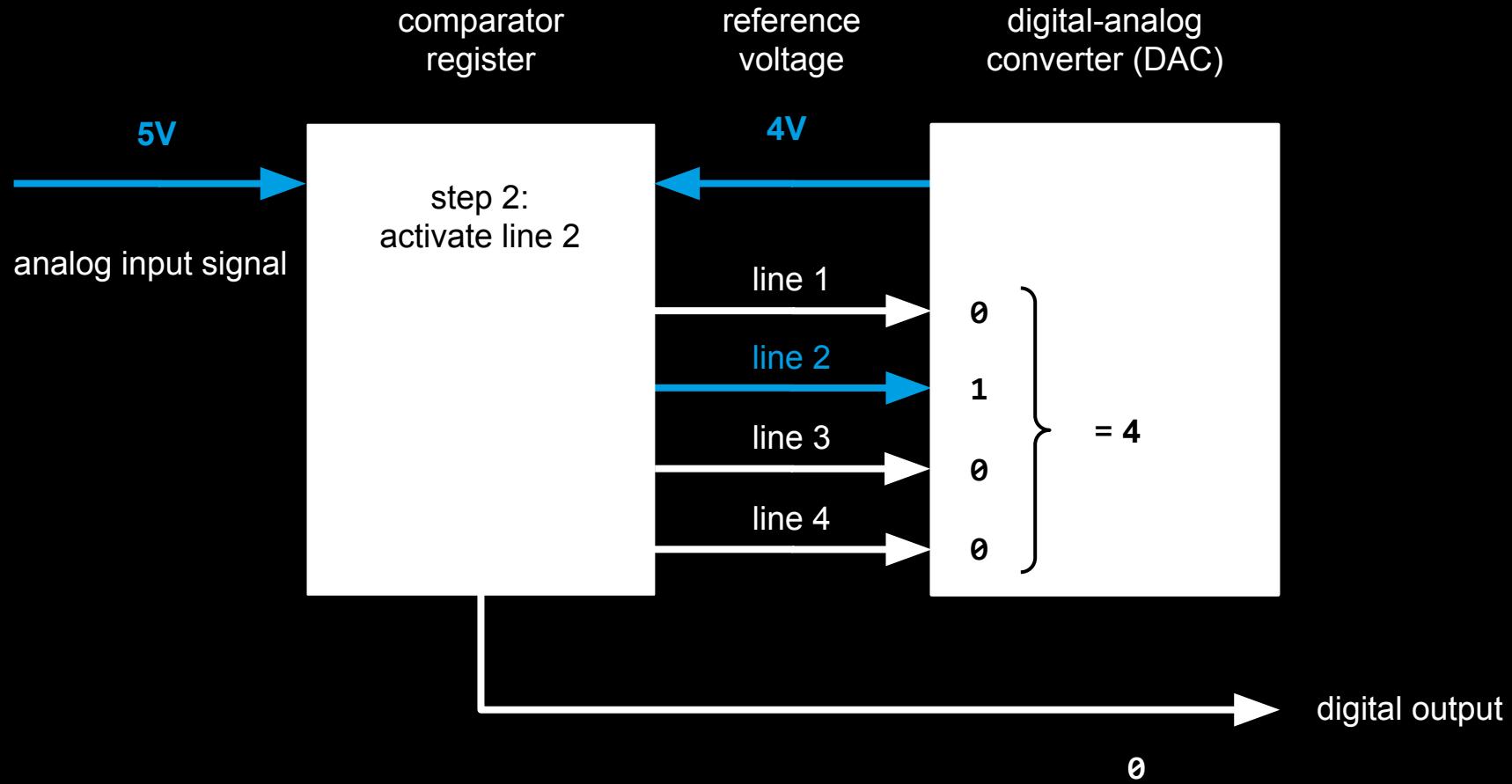


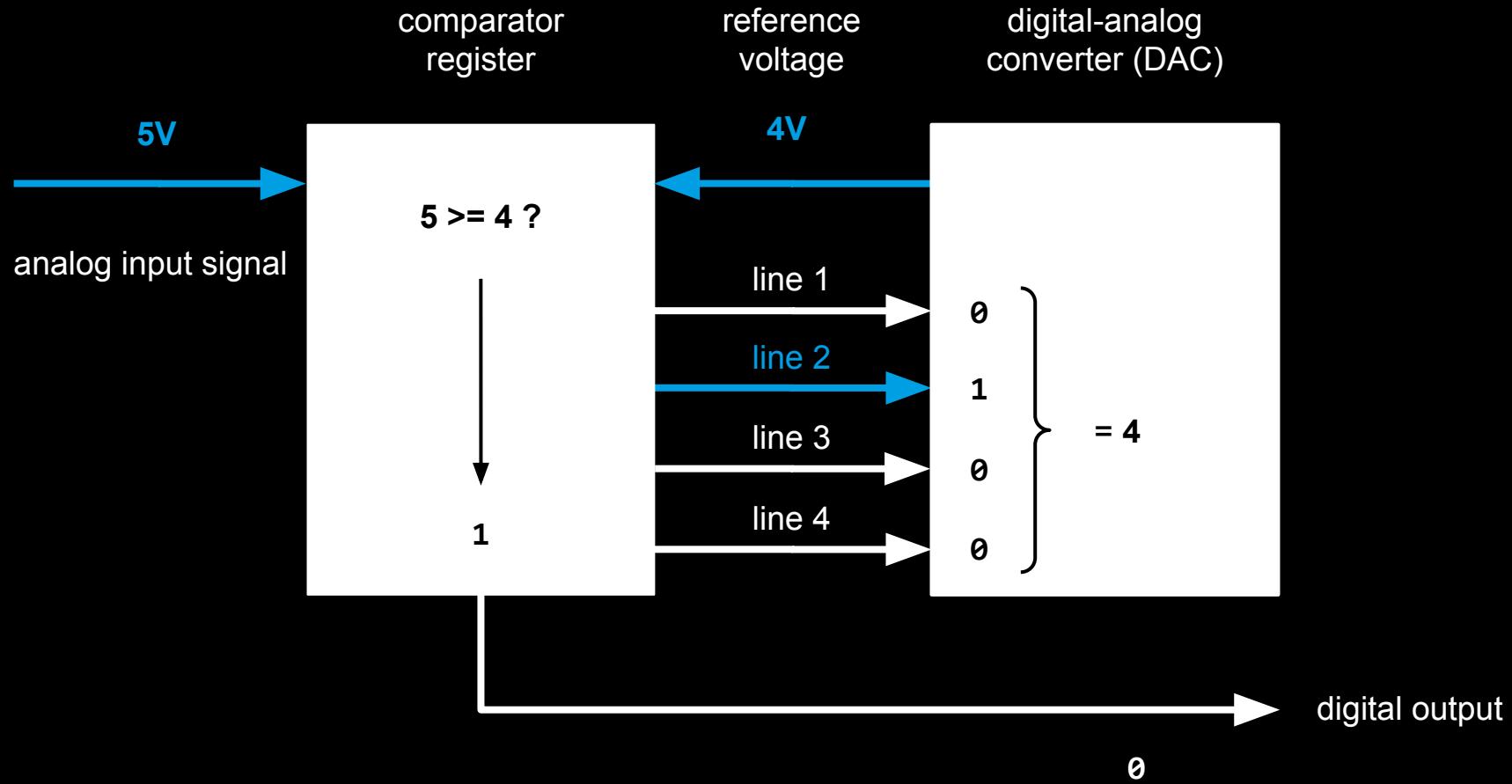


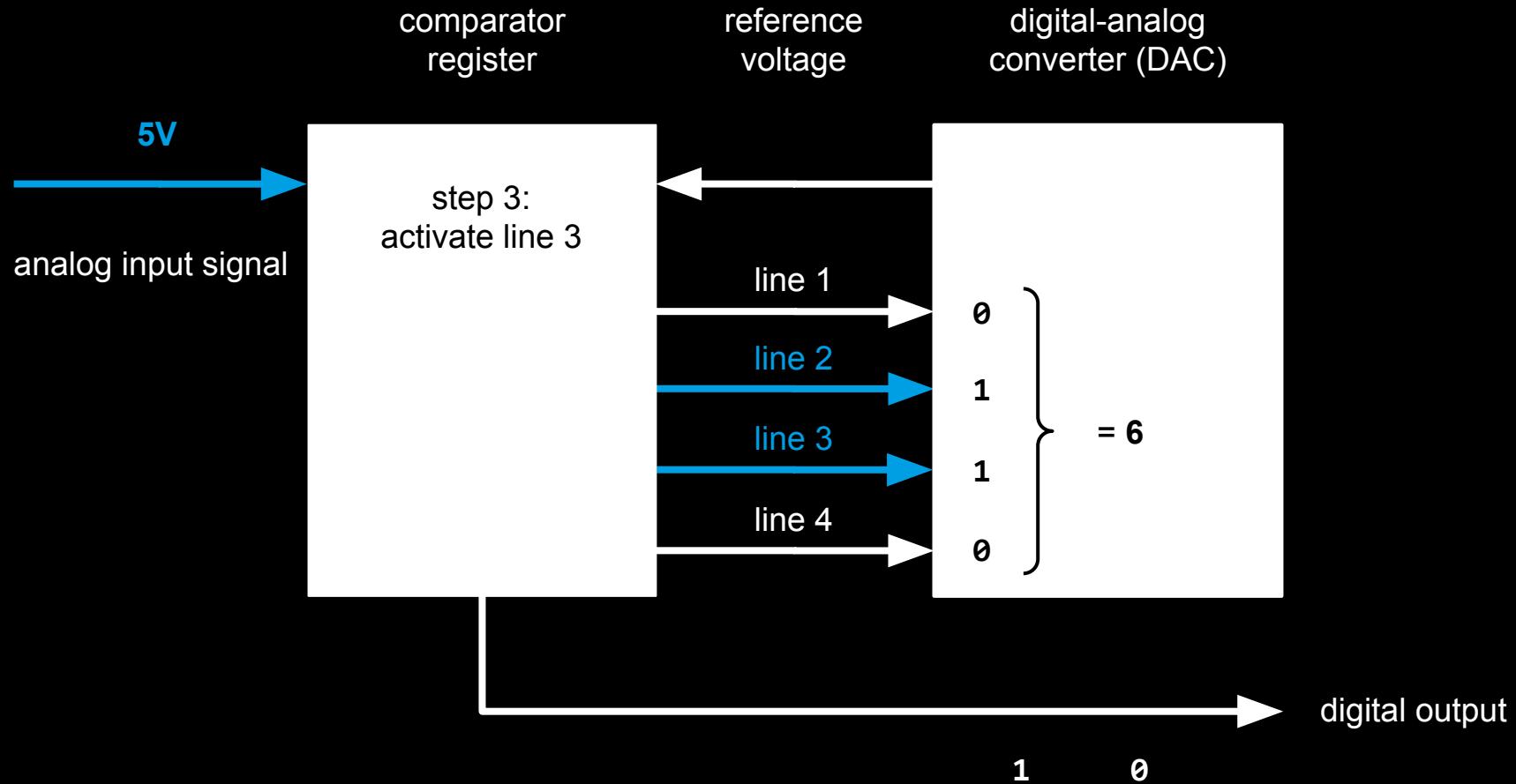


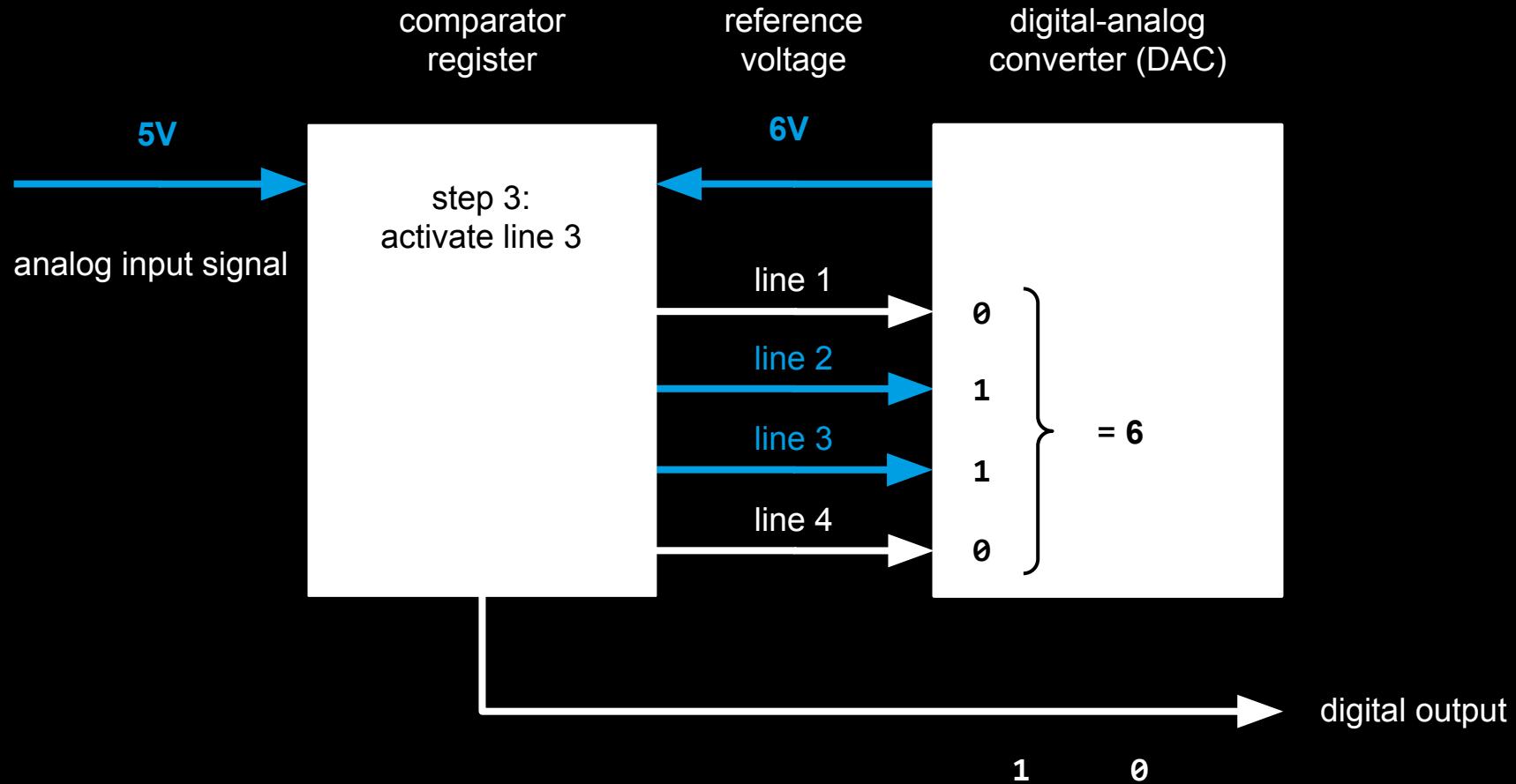


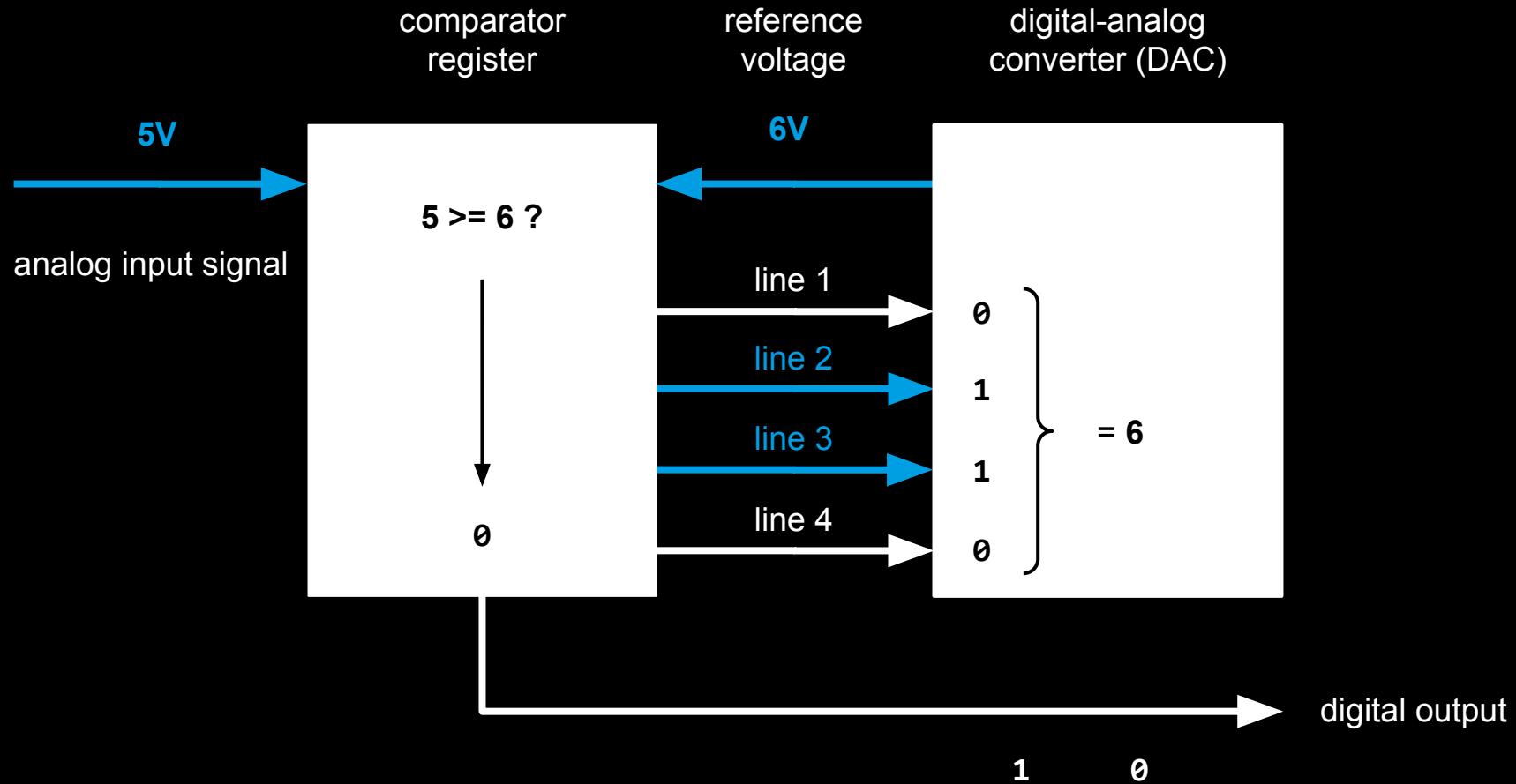


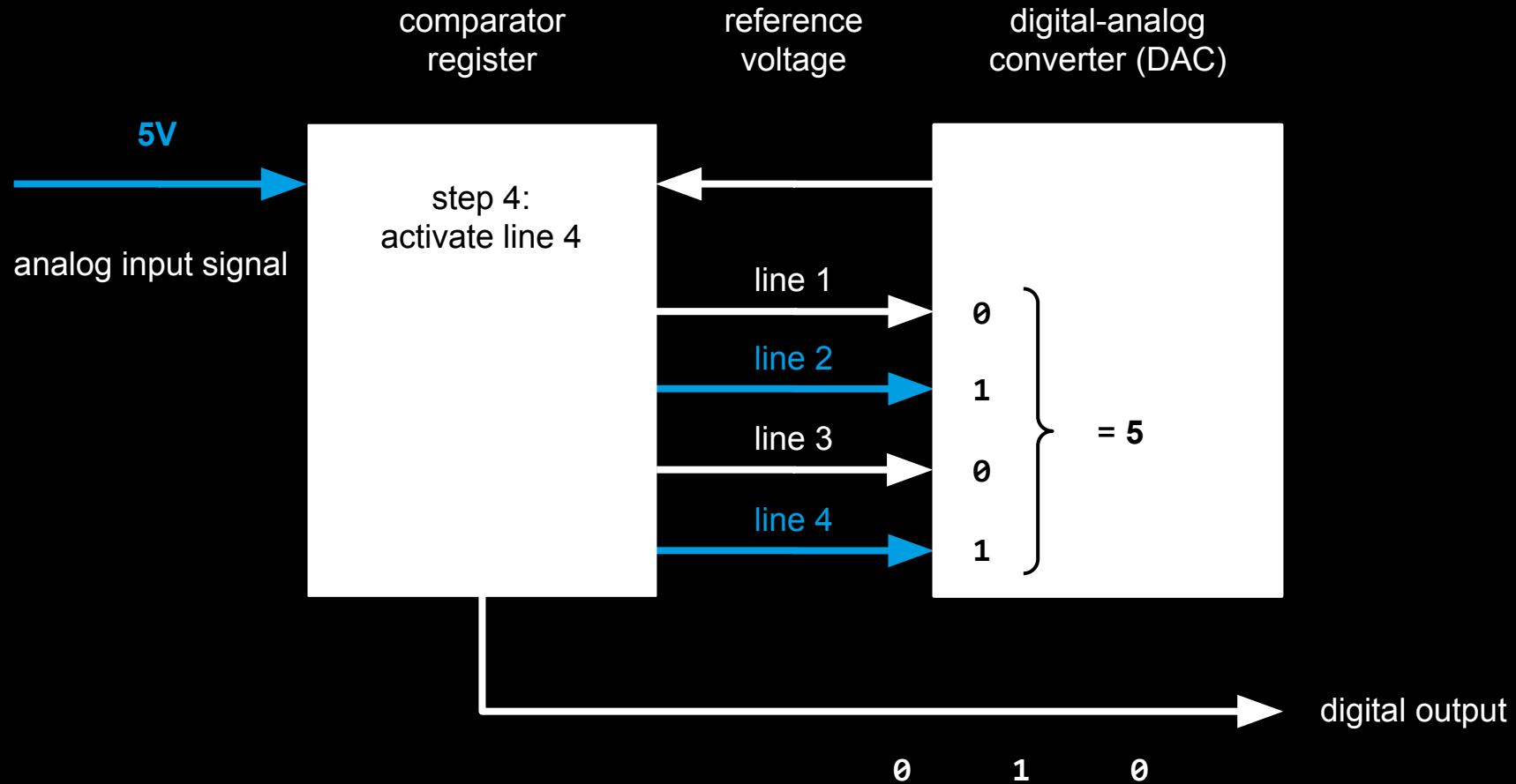


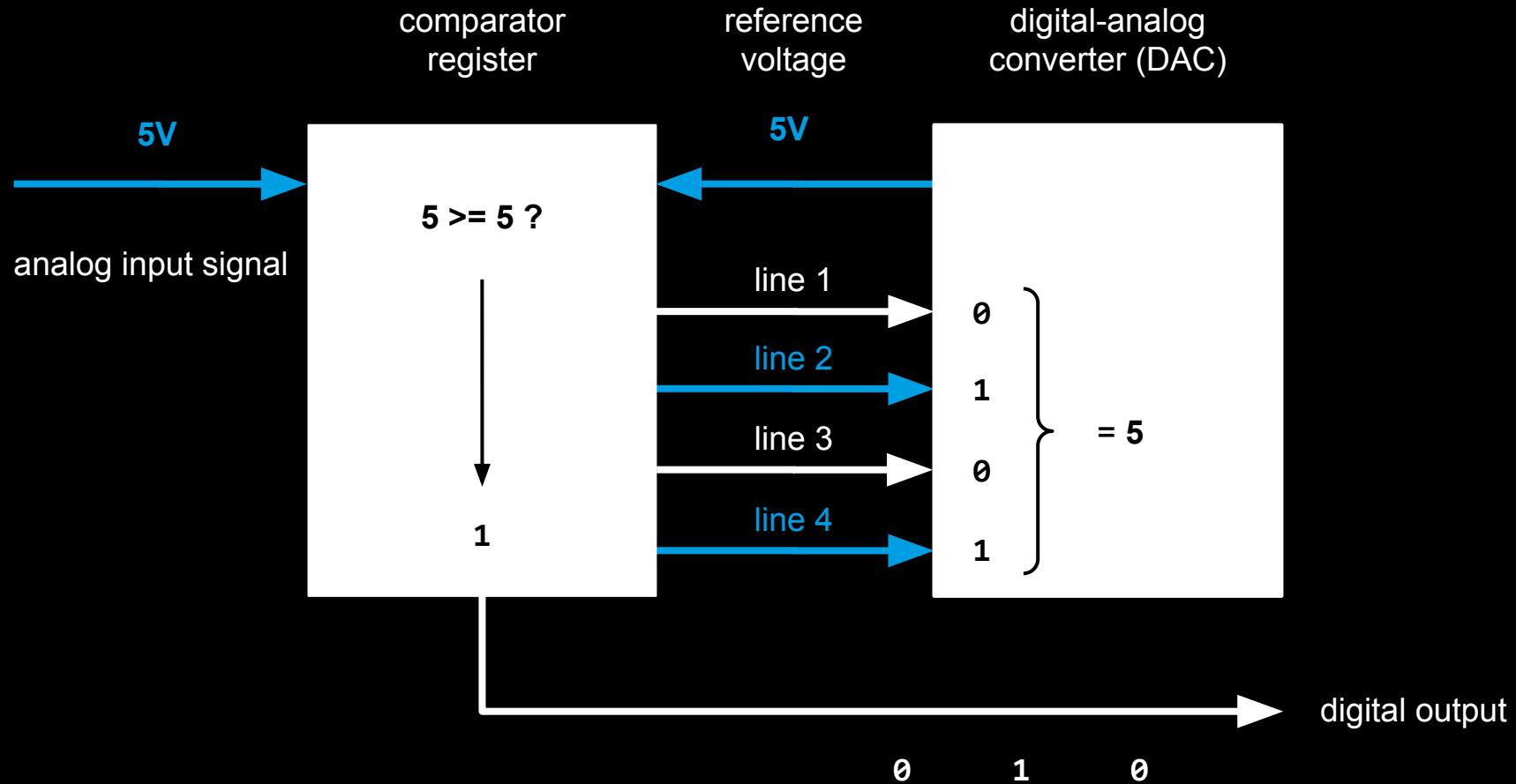


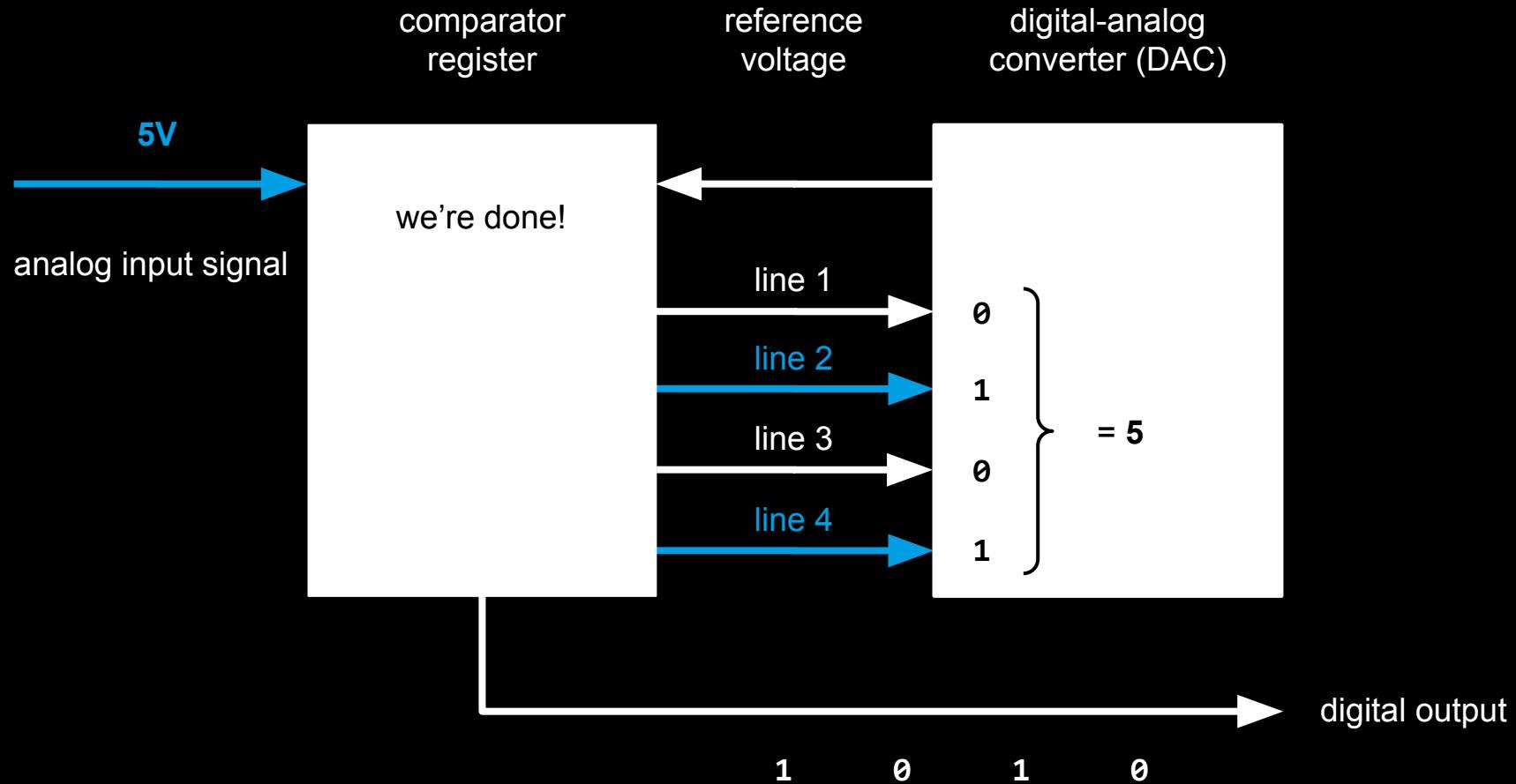




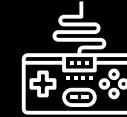
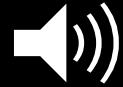


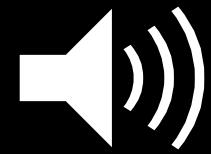




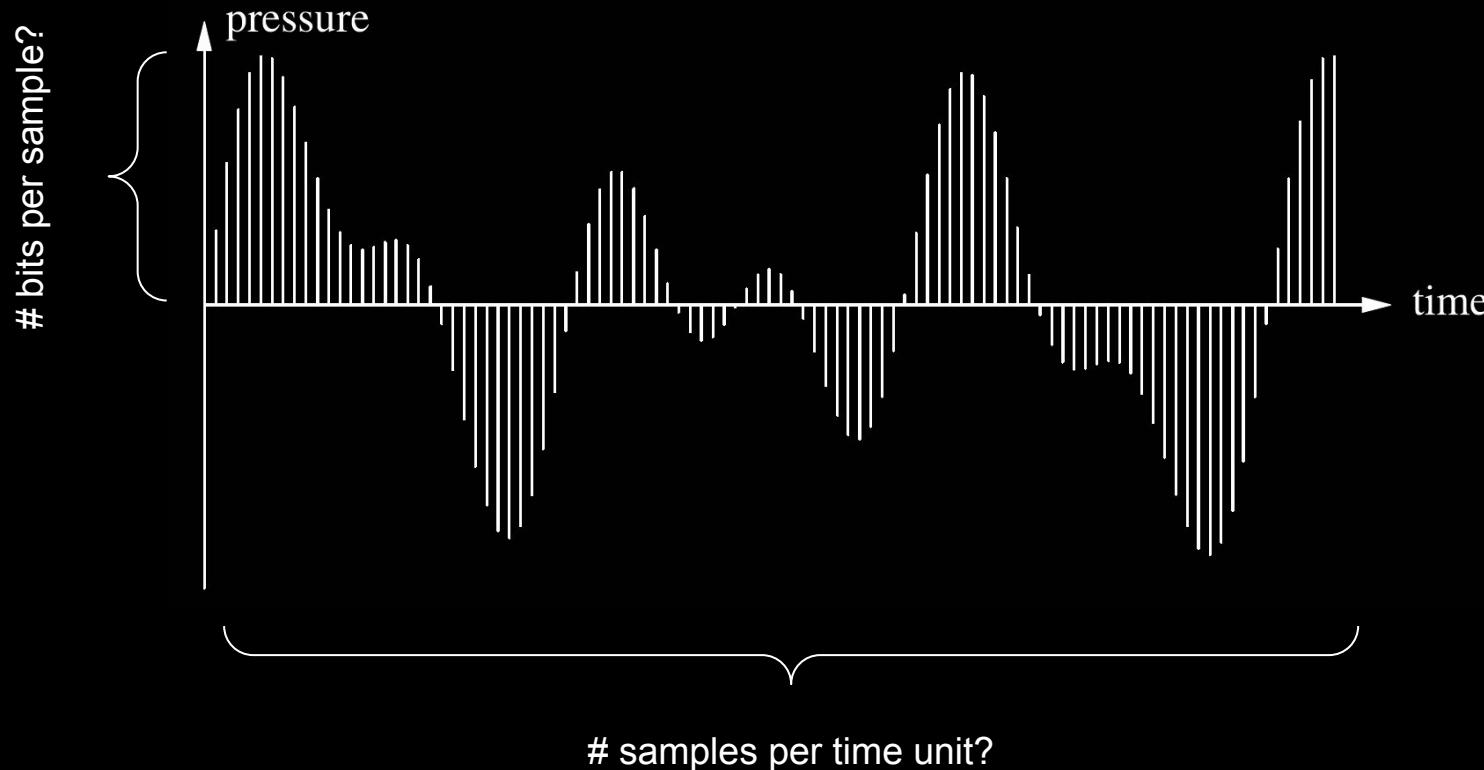


so, what analog signal is measured?



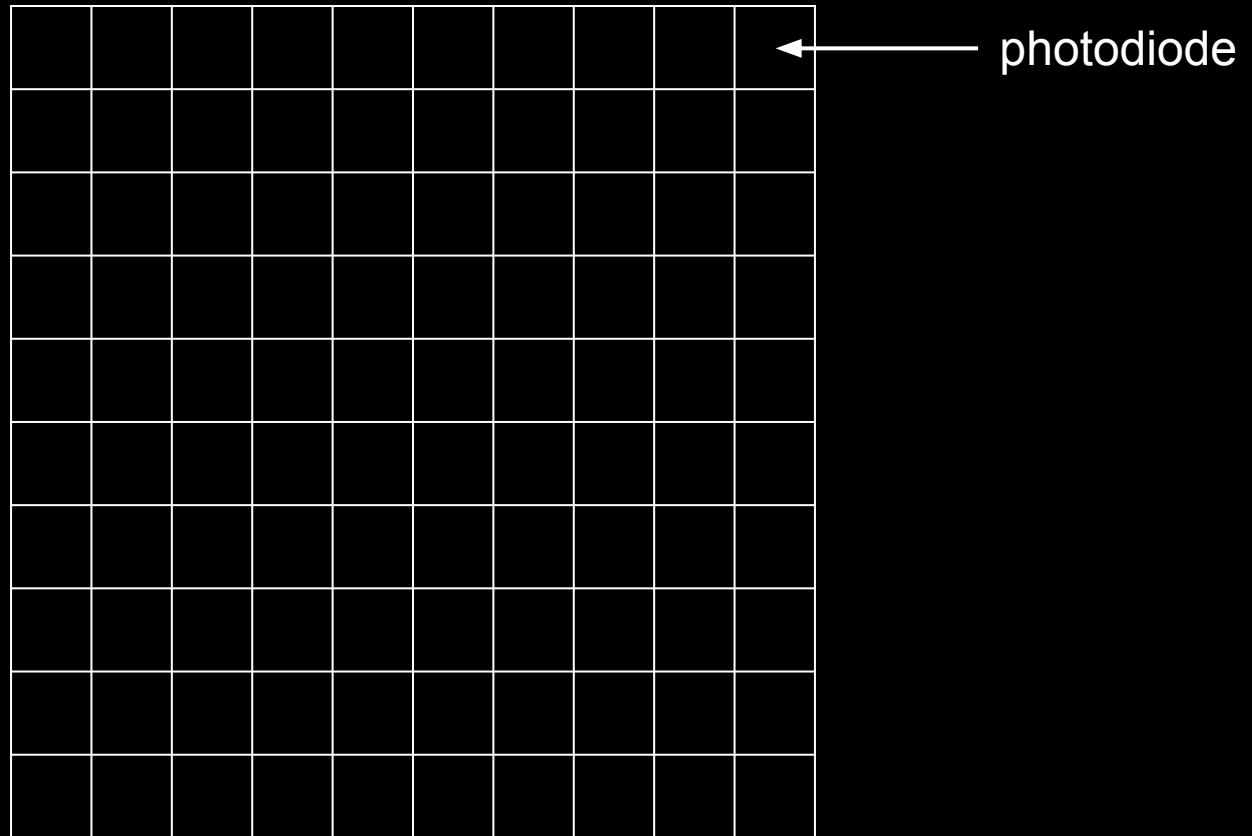


A **continuous** wave is transformed into an array of **discrete numbers** representing pressure.

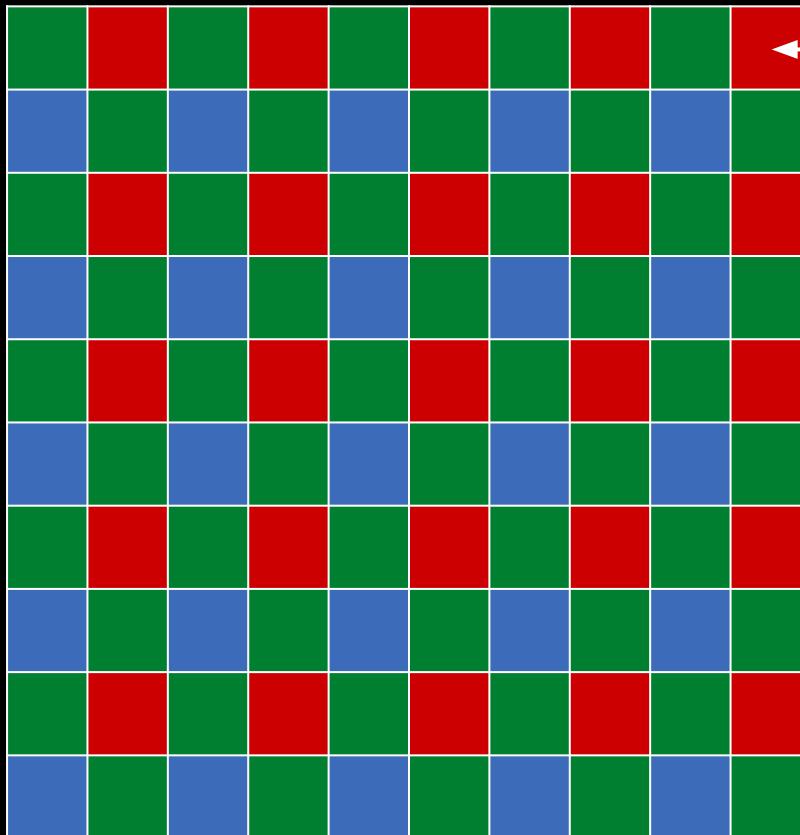




# image sensor

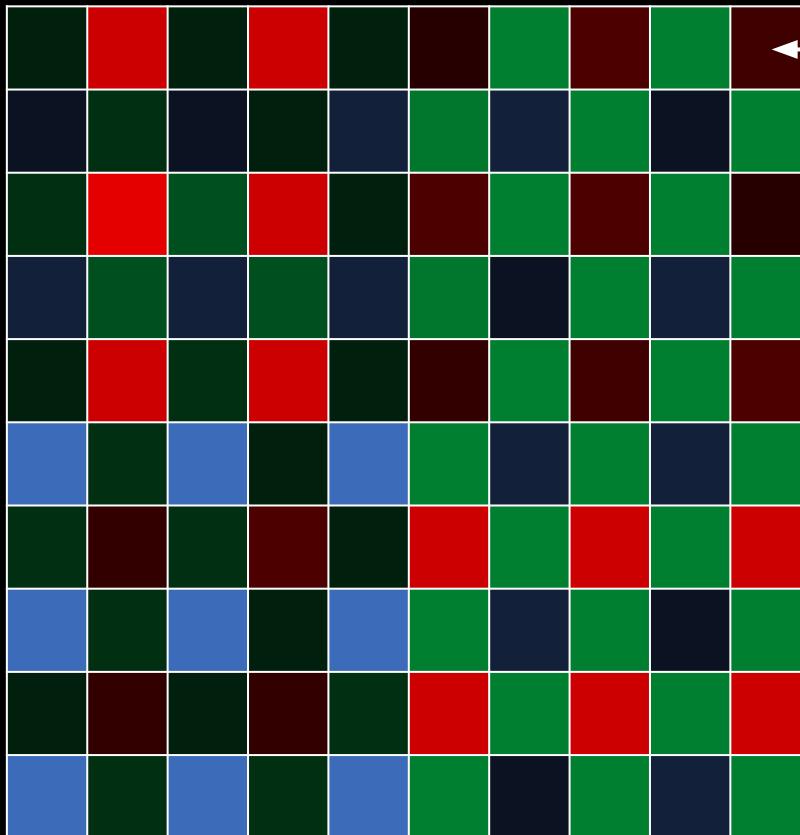


# image sensor



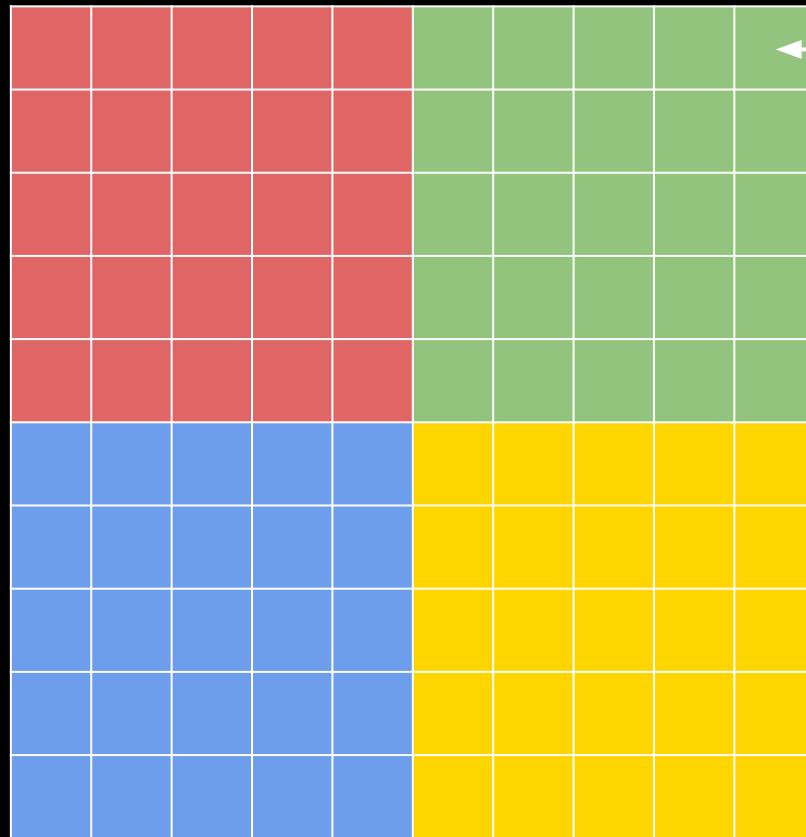
color filter on  
top of photo-  
diodes

# image sensor



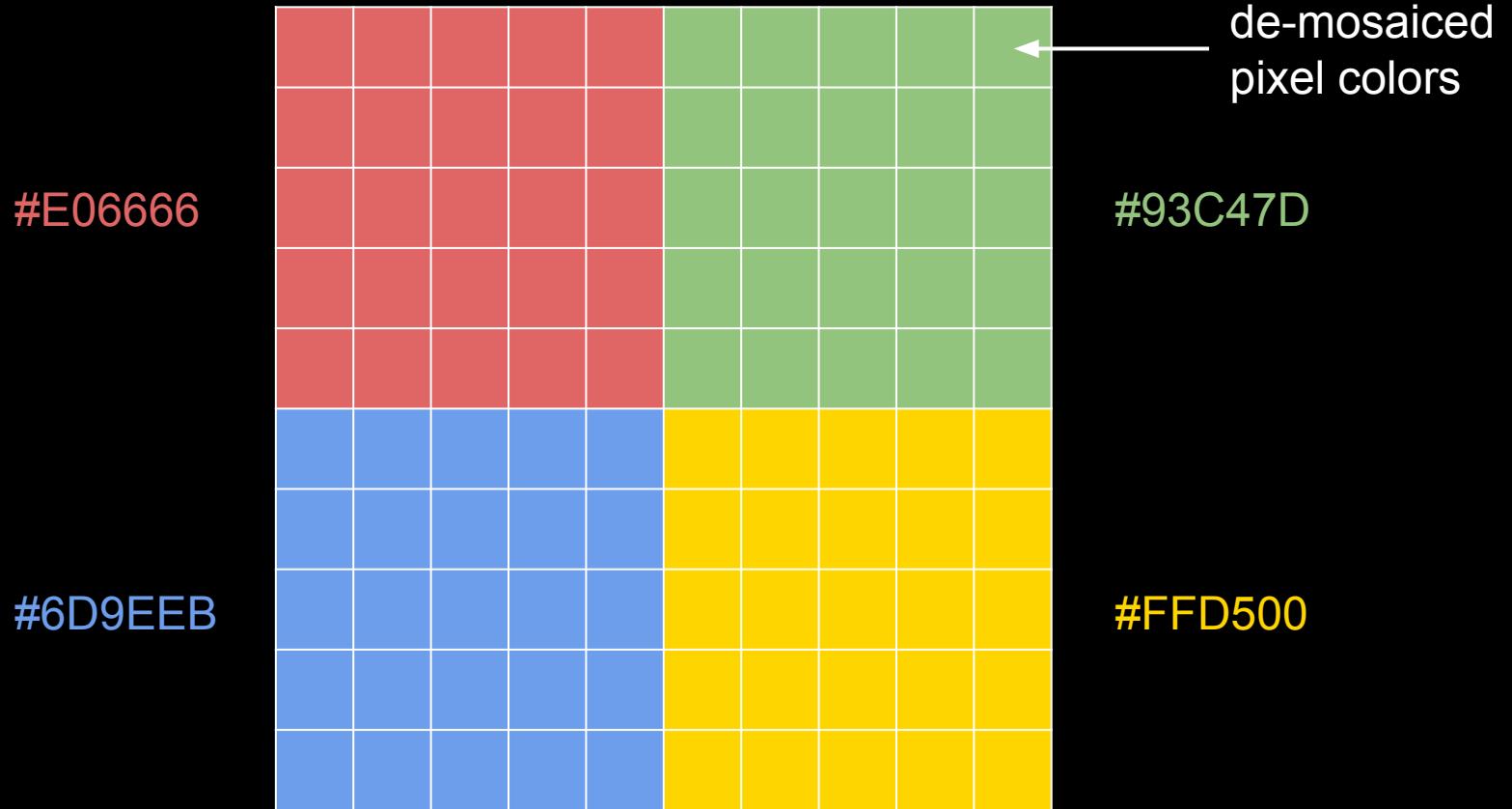
light passed  
through filter

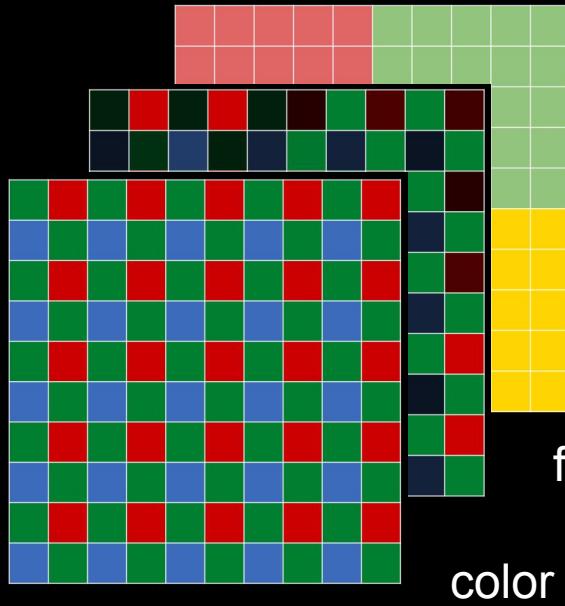
# image sensor



← de-mosaiced  
pixel colors

# image sensor

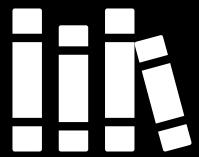




de-mosaiced pixel colors

filtered light

color filter



typing text

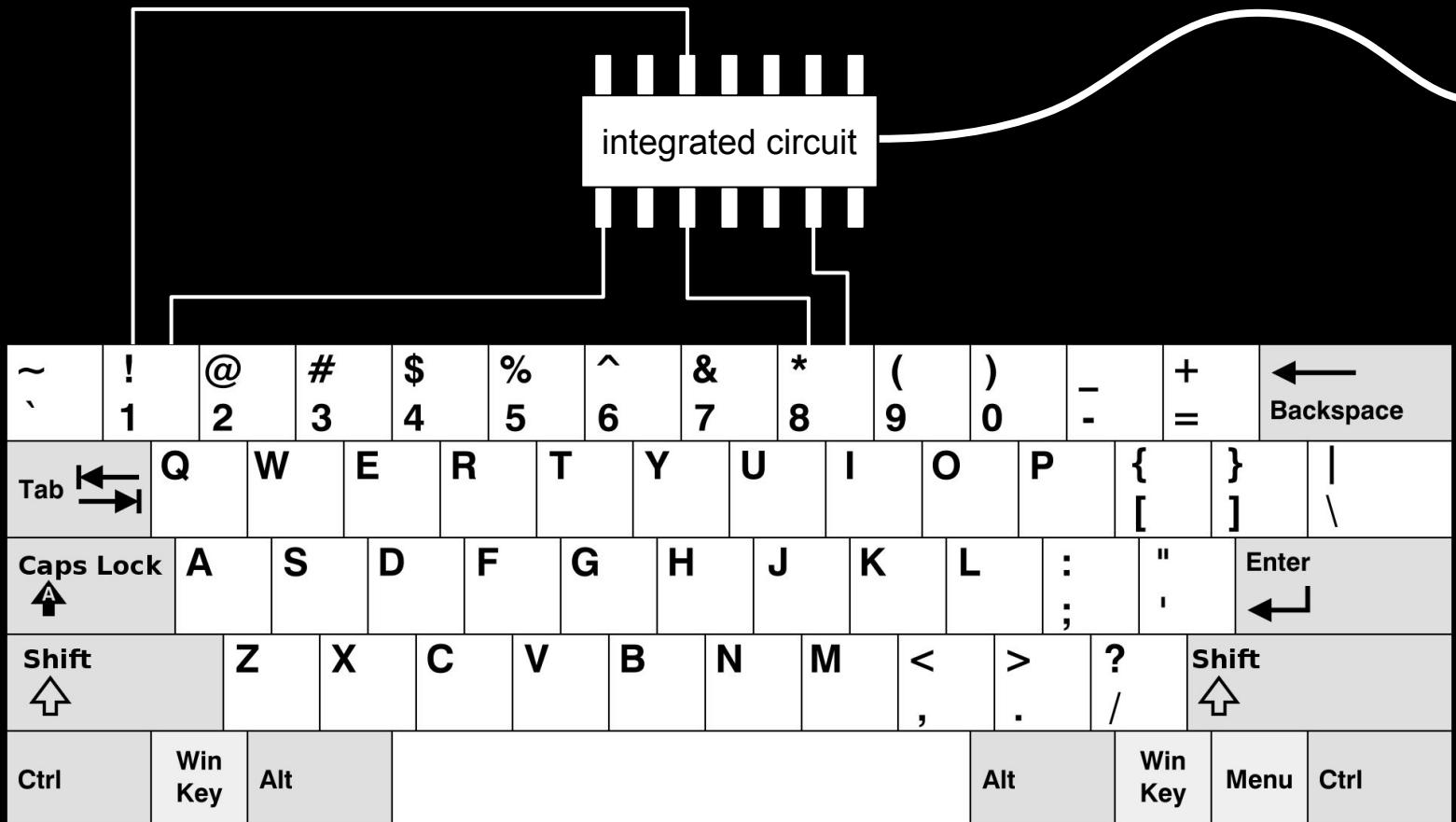


Image source: [Wikipedia](#)

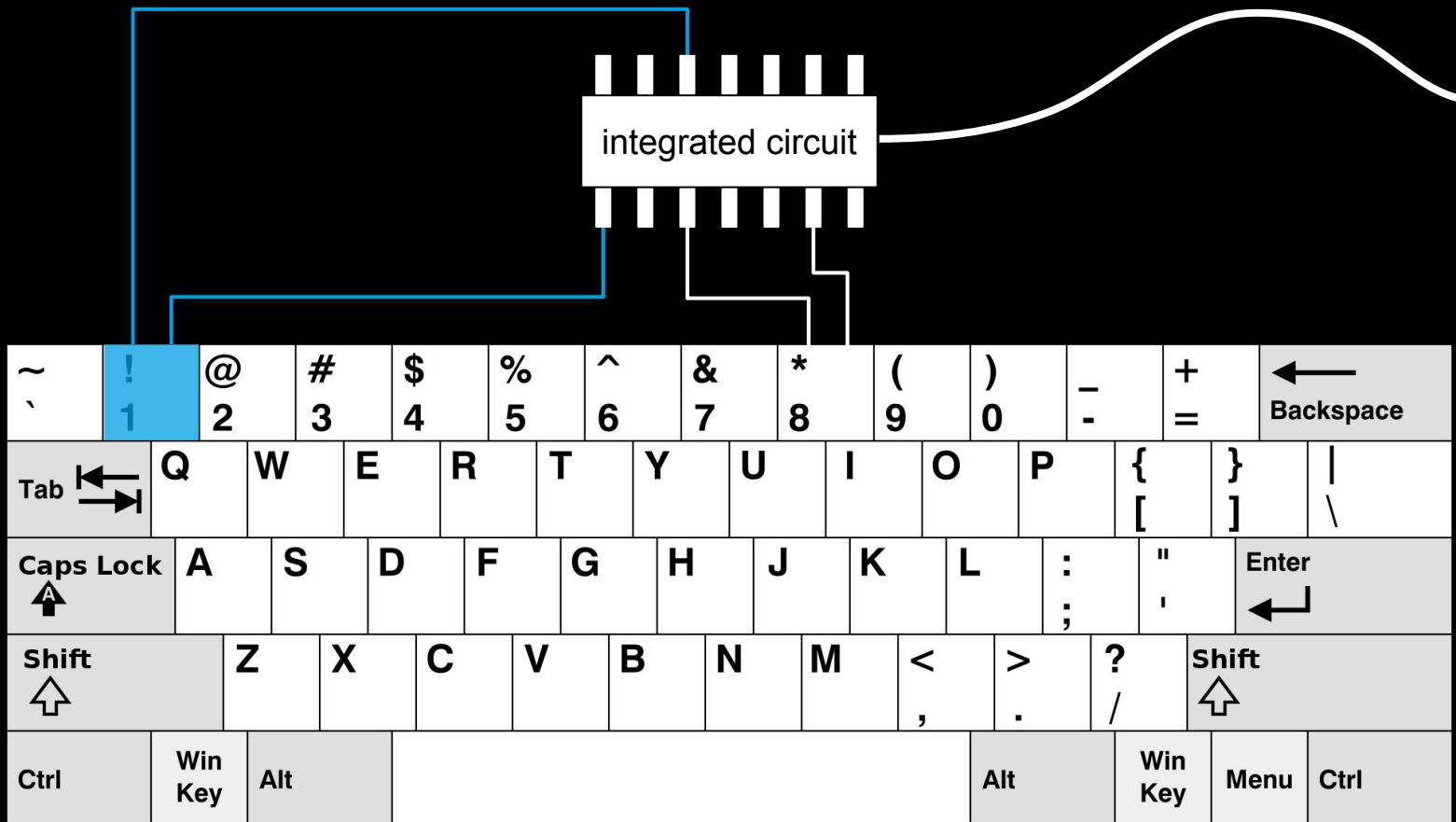


Image source: [Wikipedia](#)

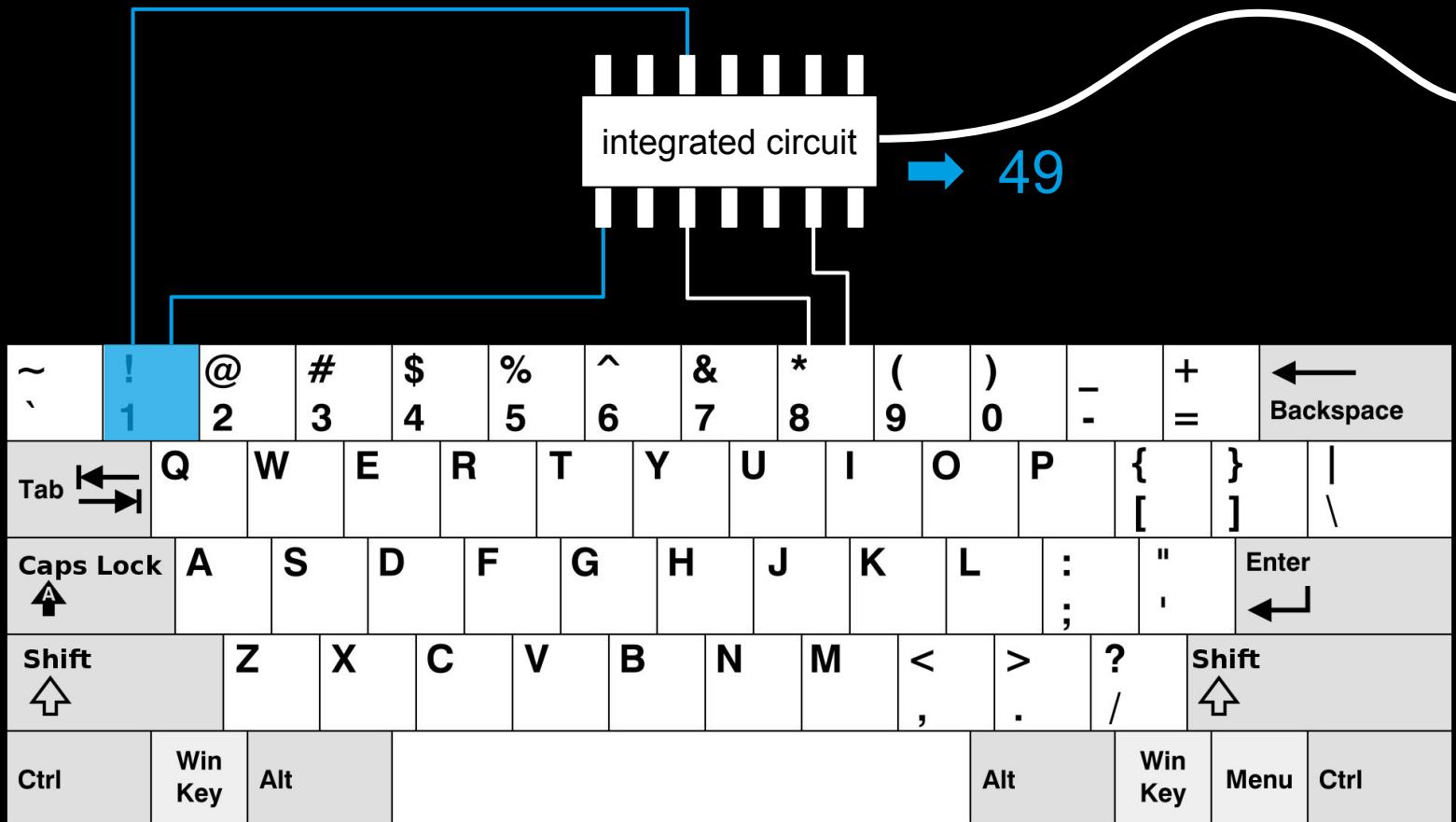


Image source: [Wikipedia](#)

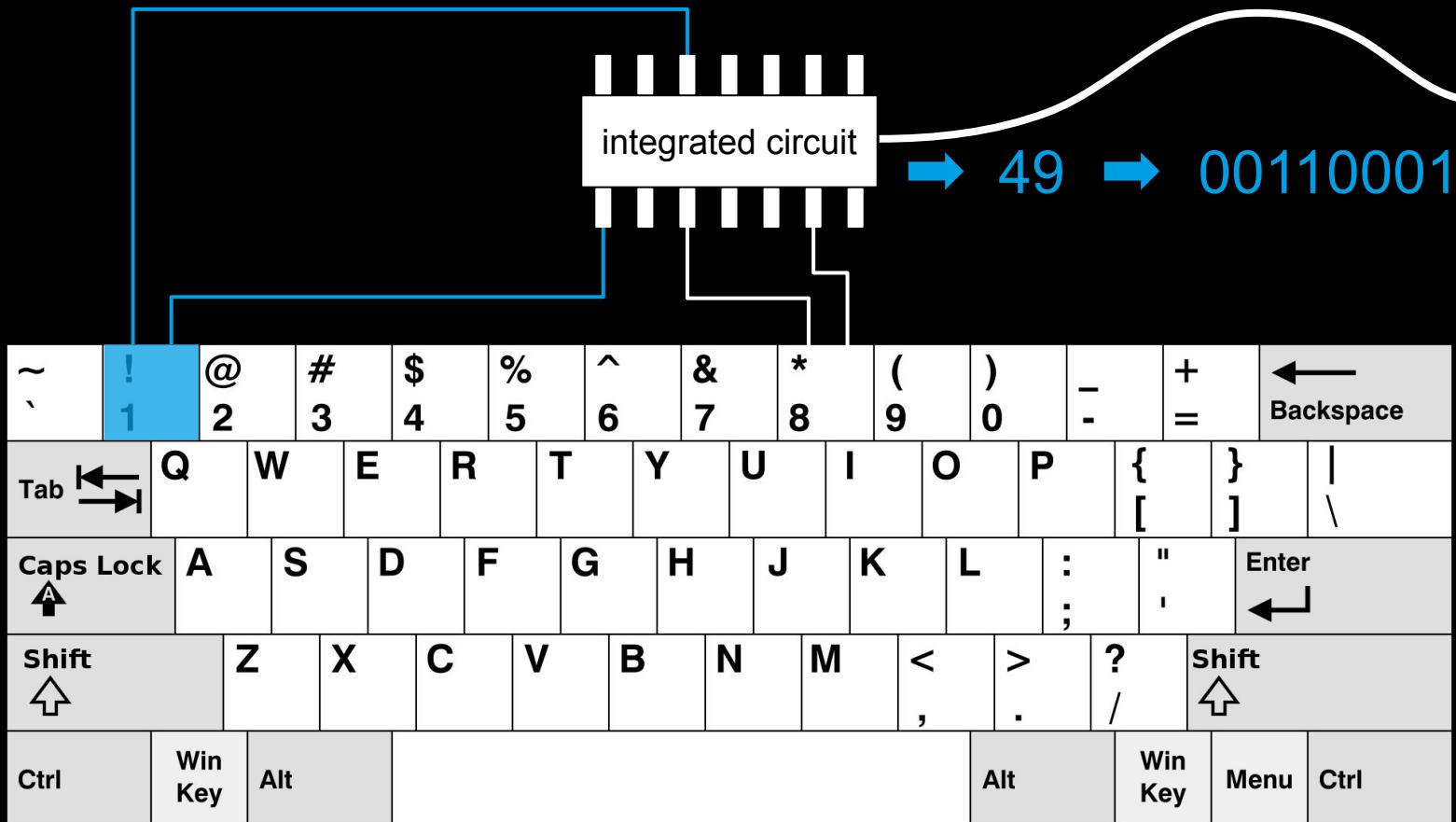


Image source: [Wikipedia](#)

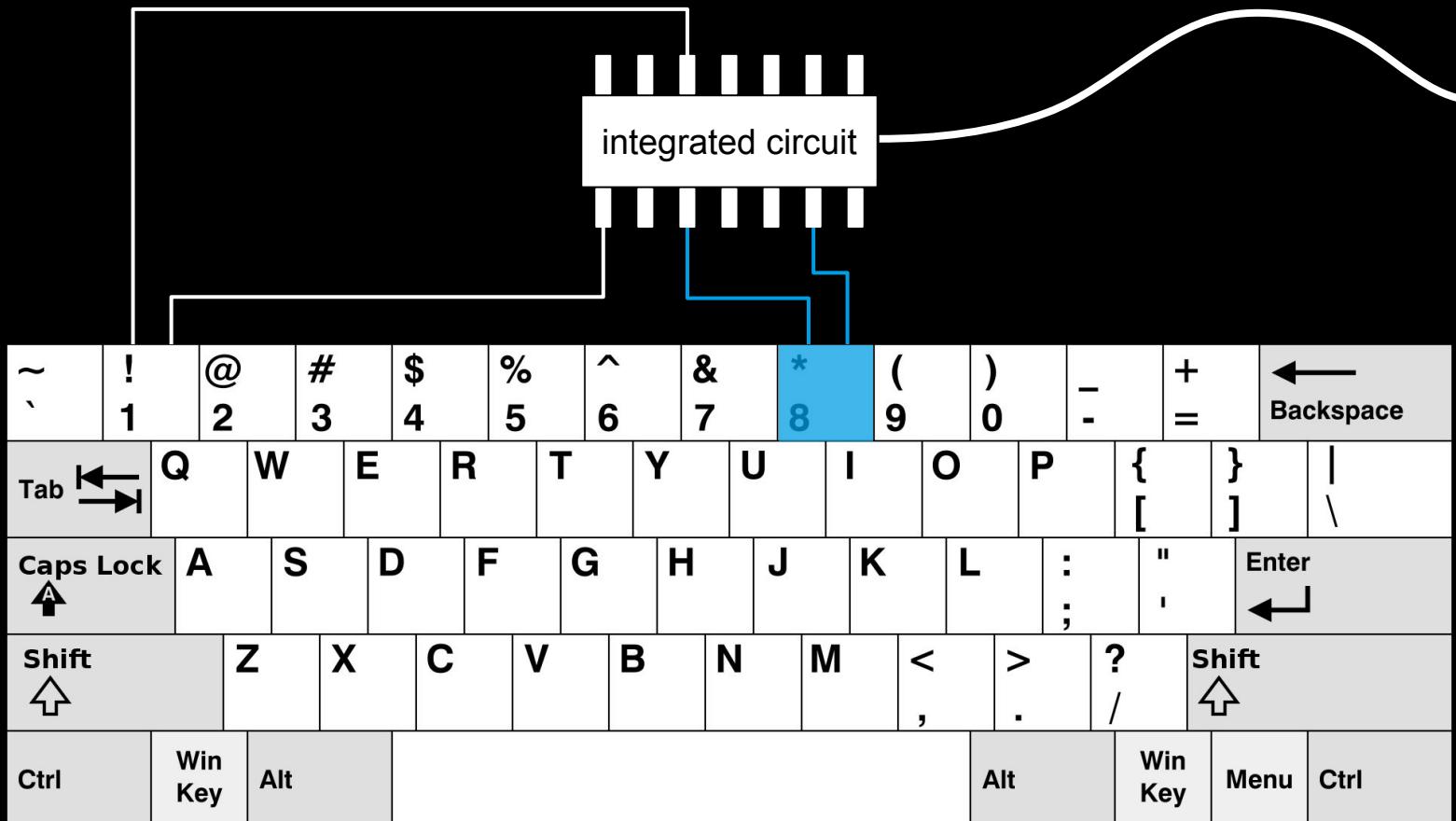


Image source: [Wikipedia](#)

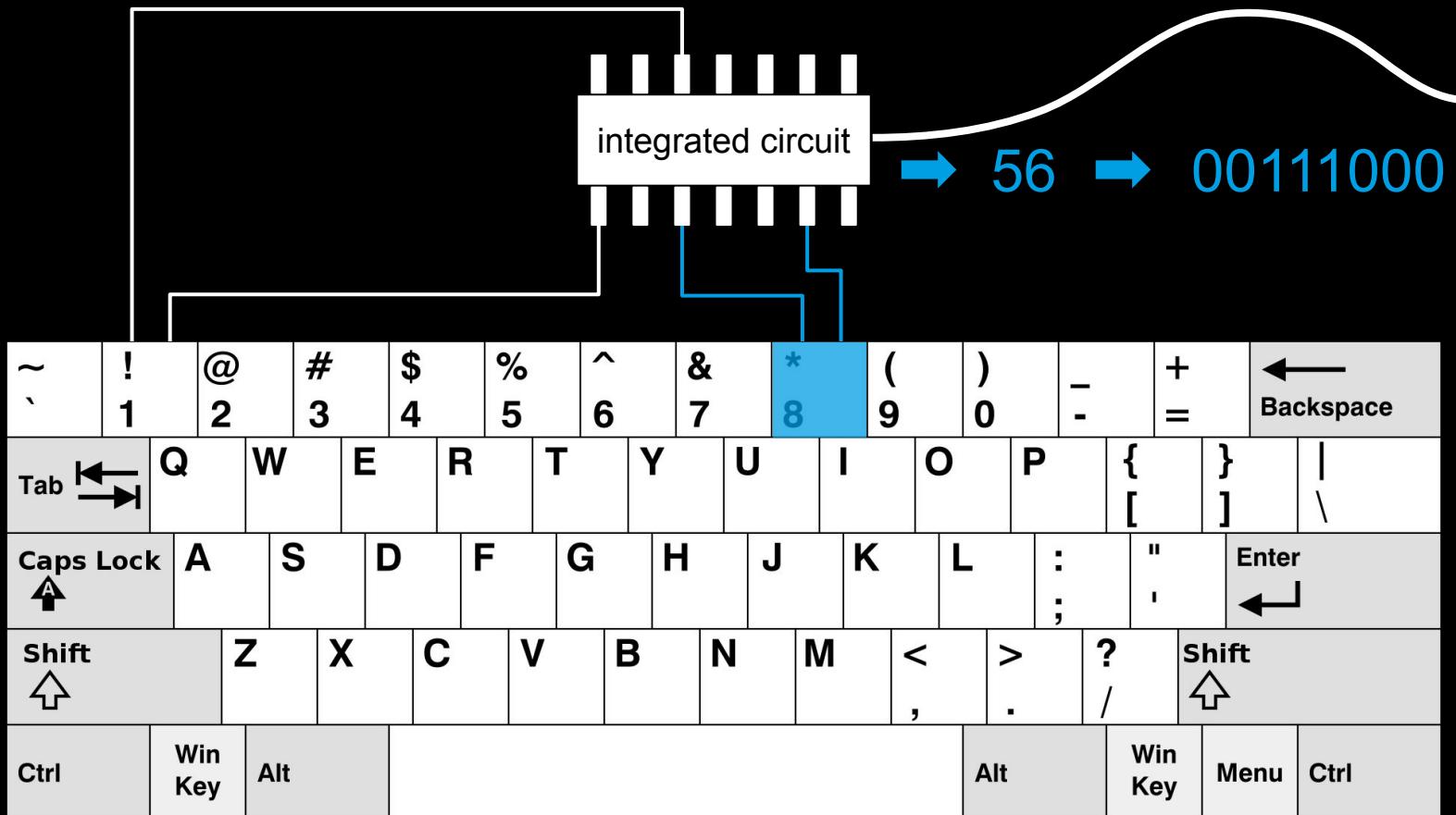


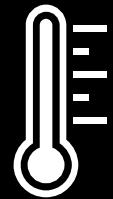
Image source: [Wikipedia](#)

scanning text



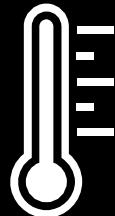
+

optical character recognition (OCR)



temperature sensor

A thermometer measures the temperature using a proxy, such as electrical resistance. The result is a change in voltage, which can be converted into a temperature.



```
1100 0101 1101 1110  
1001 0110 1111 0100  
0000 0111 1111 0001
```

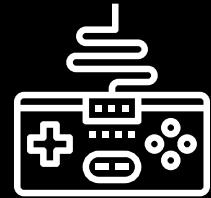




Image source: [Wikipedia](#)



Image source: [Wikipedia](#)

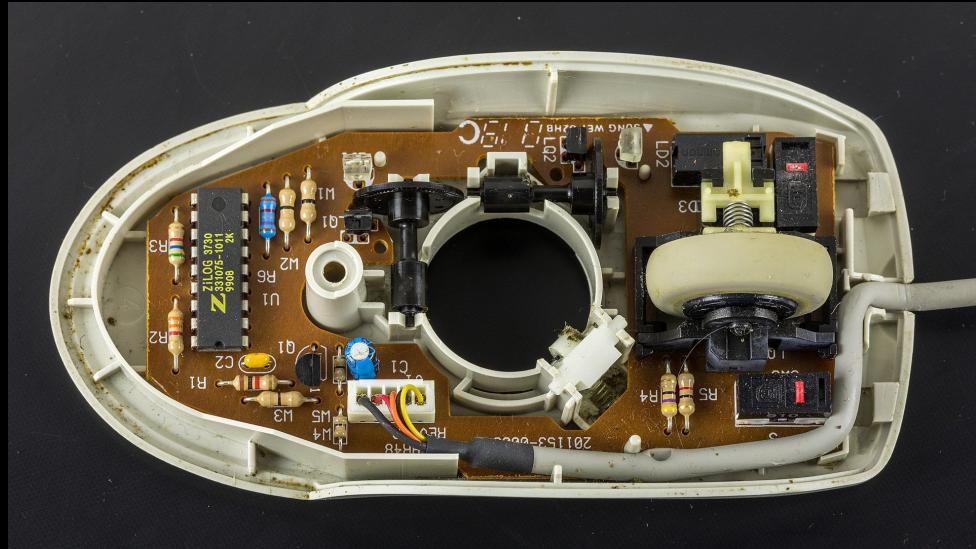


Image source: [Wikipedia](#)



Image source: [Wikipedia](#)

digital goods



Image source: [Wikipedia](#)



Image source: [Wikipedia](#)

computer processable

perfect reproduction

non-rival

near-zero costs of reproduction