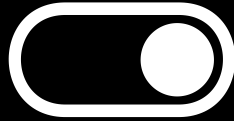
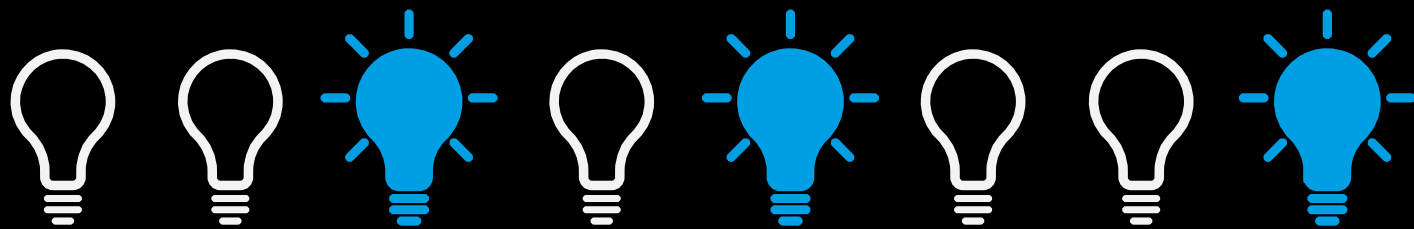


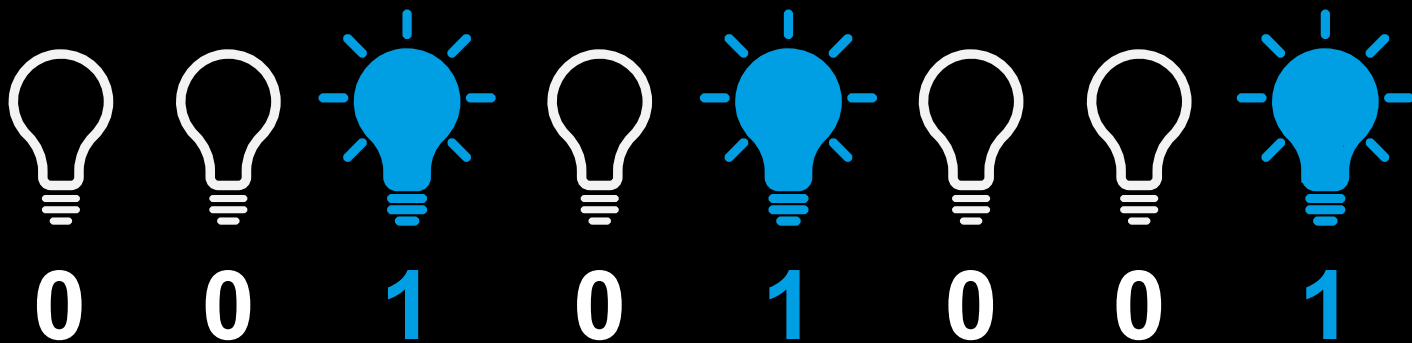
# BITS & BYTES

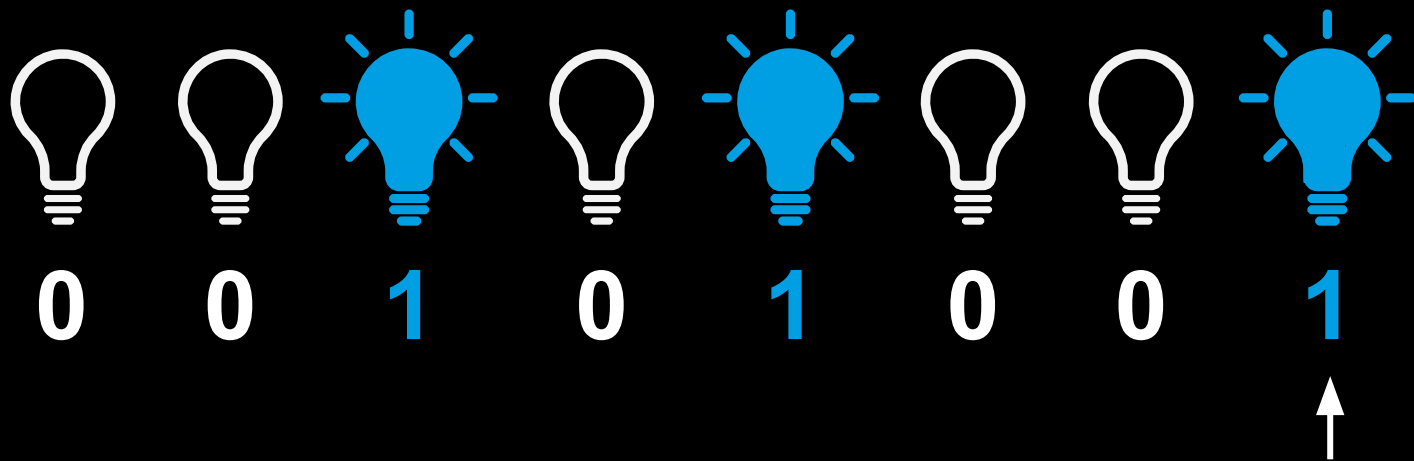
[BACK](#)

why do computers think **binary**?

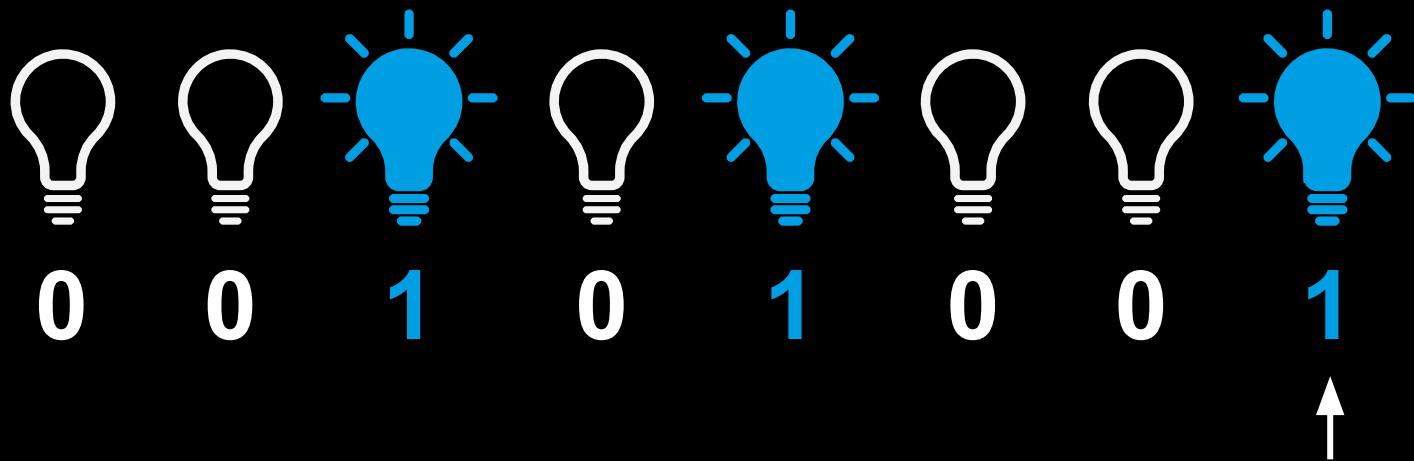






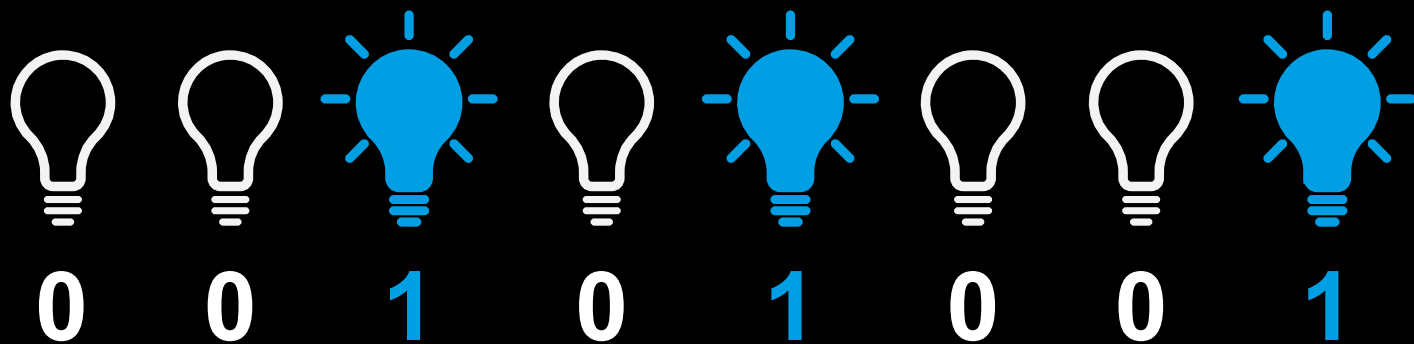


a **bit** (binary digit)



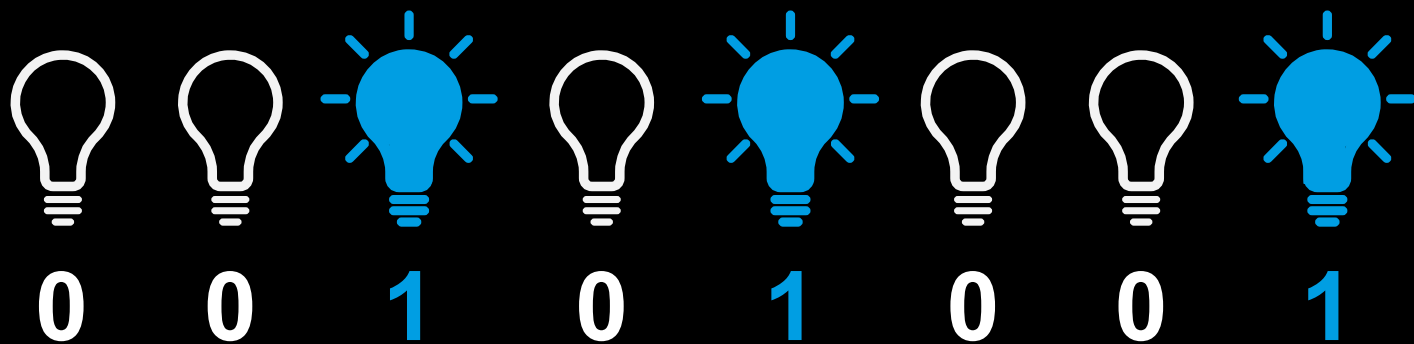
a **bit** (binary digit)

a **byte** (8 bits)



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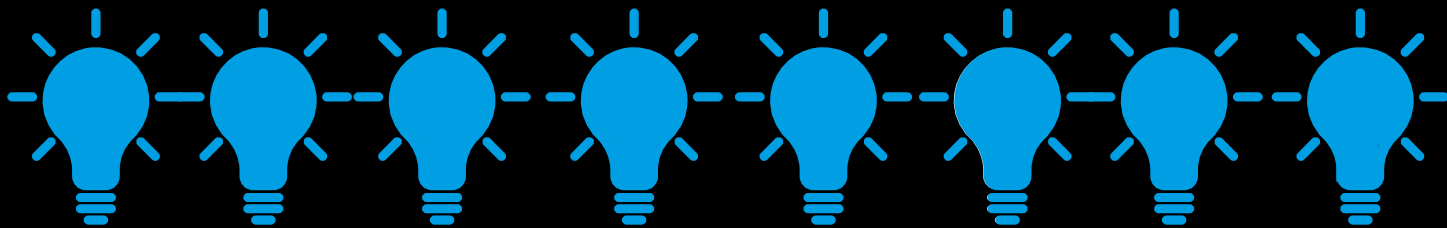
$2^7$   $2^6$   $2^5$   $2^4$   $2^3$   $2^2$   $2^1$   $2^0$



---

$2^7$	$2^6$	$2^5$	$2^4$	$2^3$	$2^2$	$2^1$	$2^0$
128	64	32	16	8	4	2	1





what can we store in one byte?

what comes after the byte?

$2^{10}$  bytes = 1.024 bytes = 1 Kibibyte (KiB)

$2^{20}$  bytes = 1.048.576 bytes = 1 Mebibyte (MiB)

$2^{30}$  bytes = 1.073.741.824 bytes = 1 Gibibyte (GiB)

$10^3$  bytes = 1.000 bytes = 1 Kilobyte (KB)

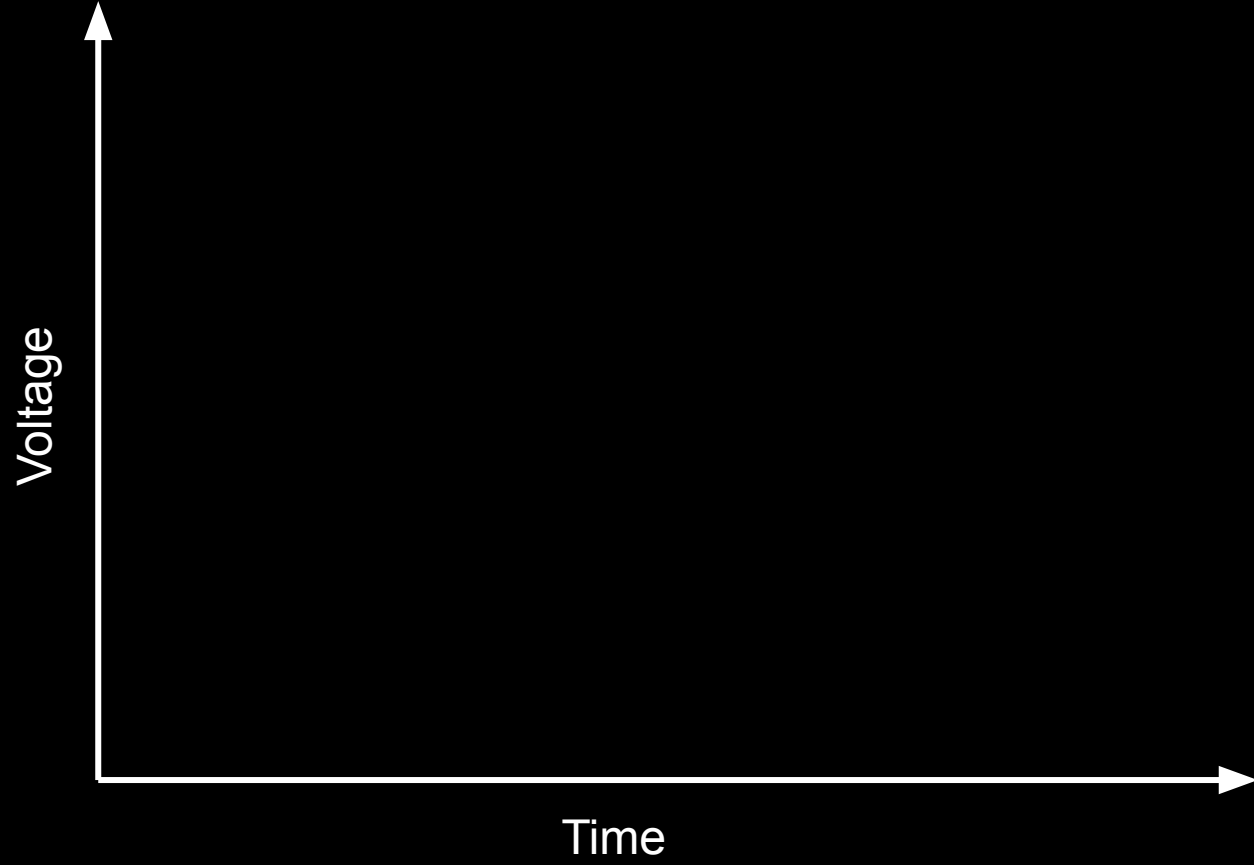
$10^6$  bytes = 1.000.000 bytes = 1 Megabyte (MB)

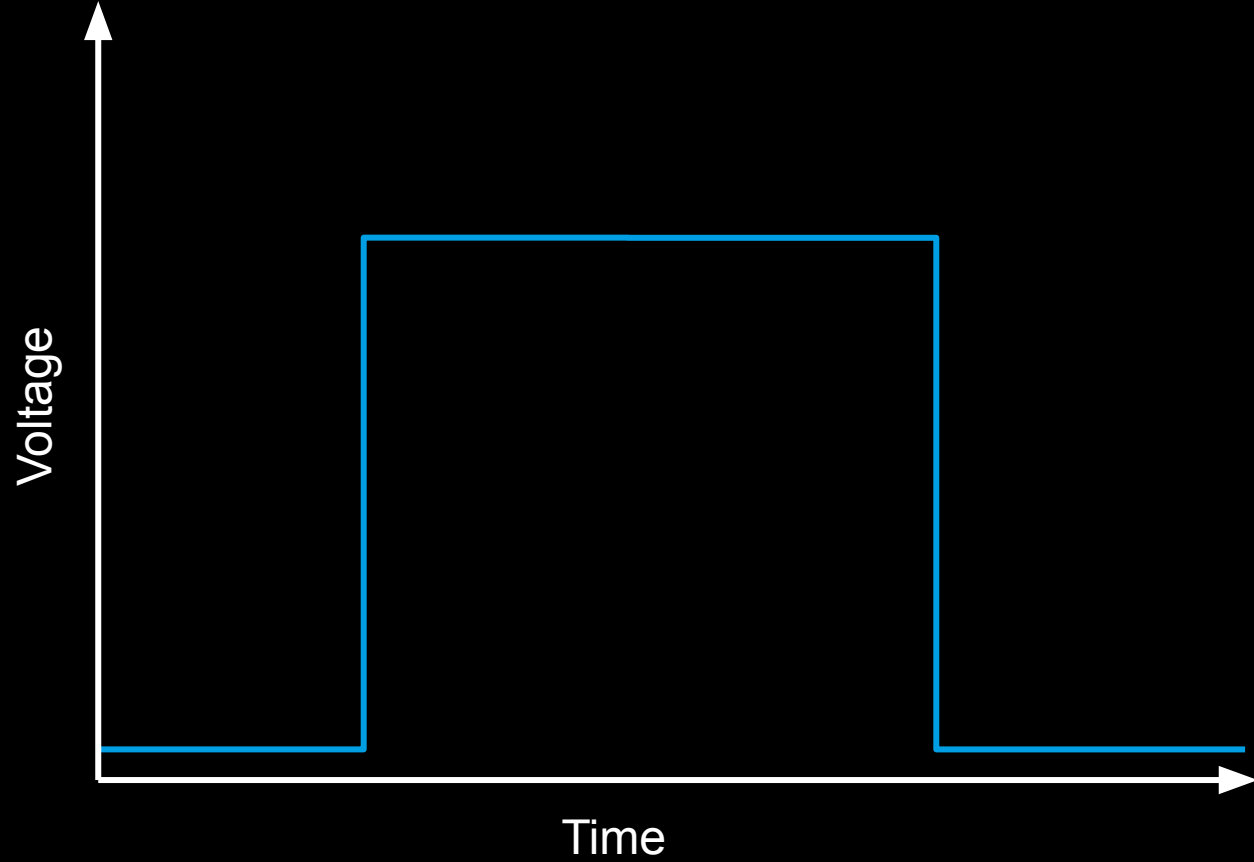
$10^9$  bytes = 1.000.000.000 bytes = 1 Gigabyte (GB)

$10^{12}$  bytes = ?

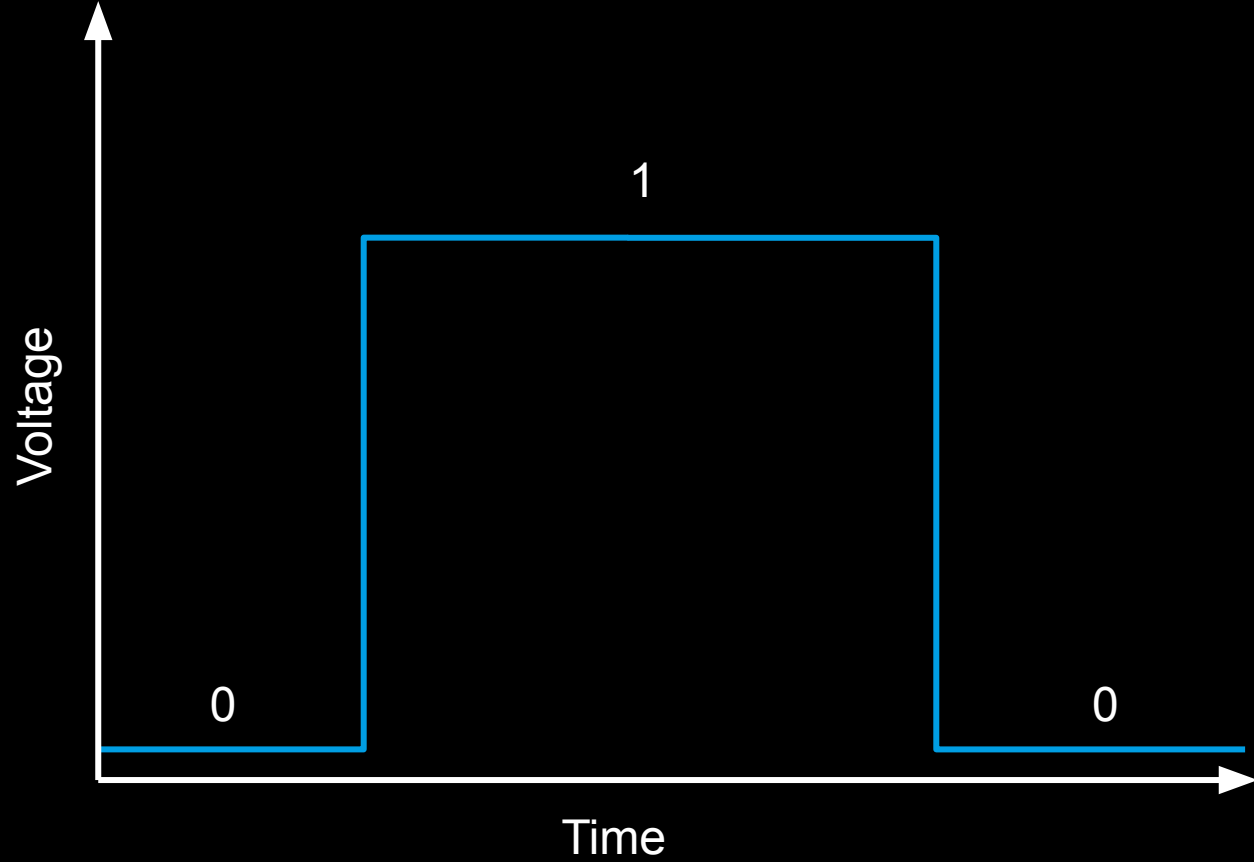
how many bits are on a DVD with  
4.7 GB capacity?

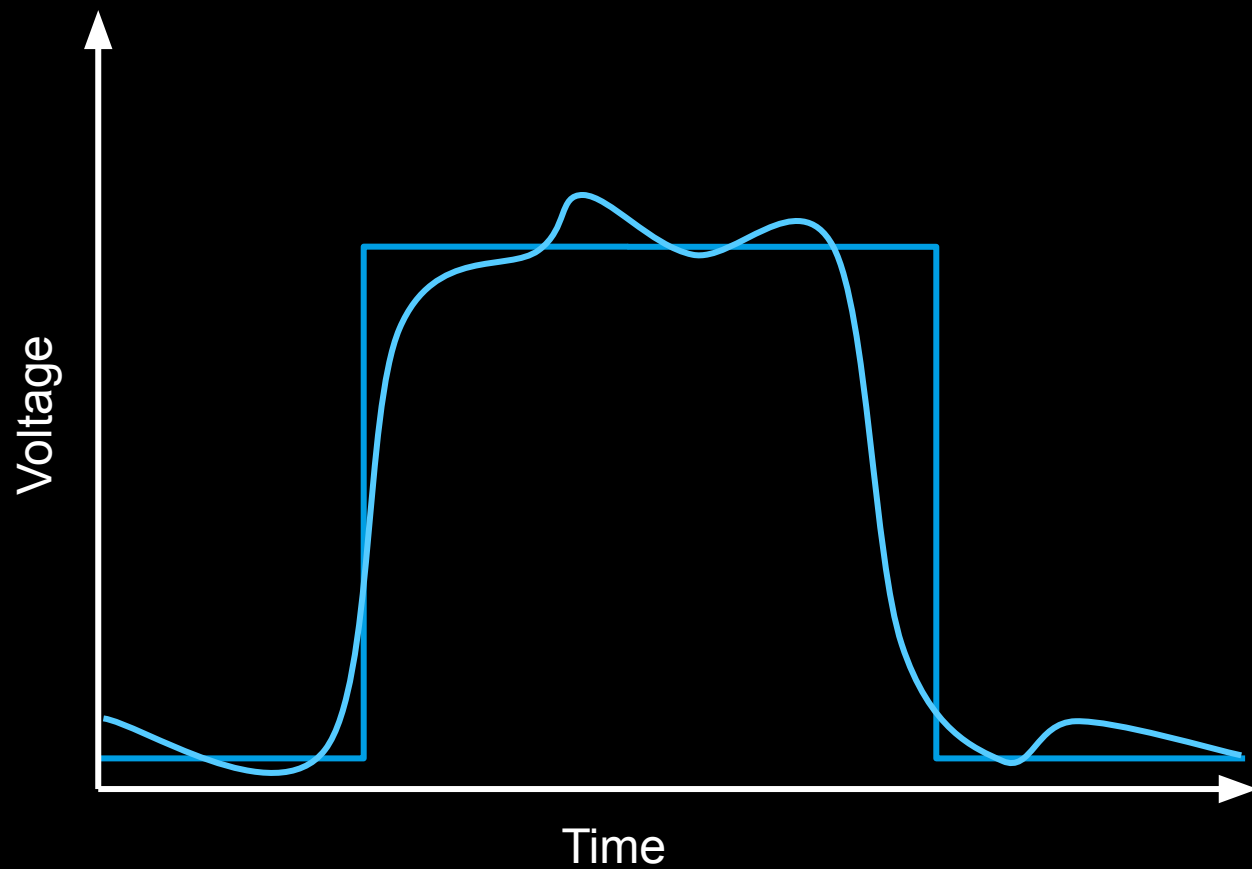
are we stuck with binary?

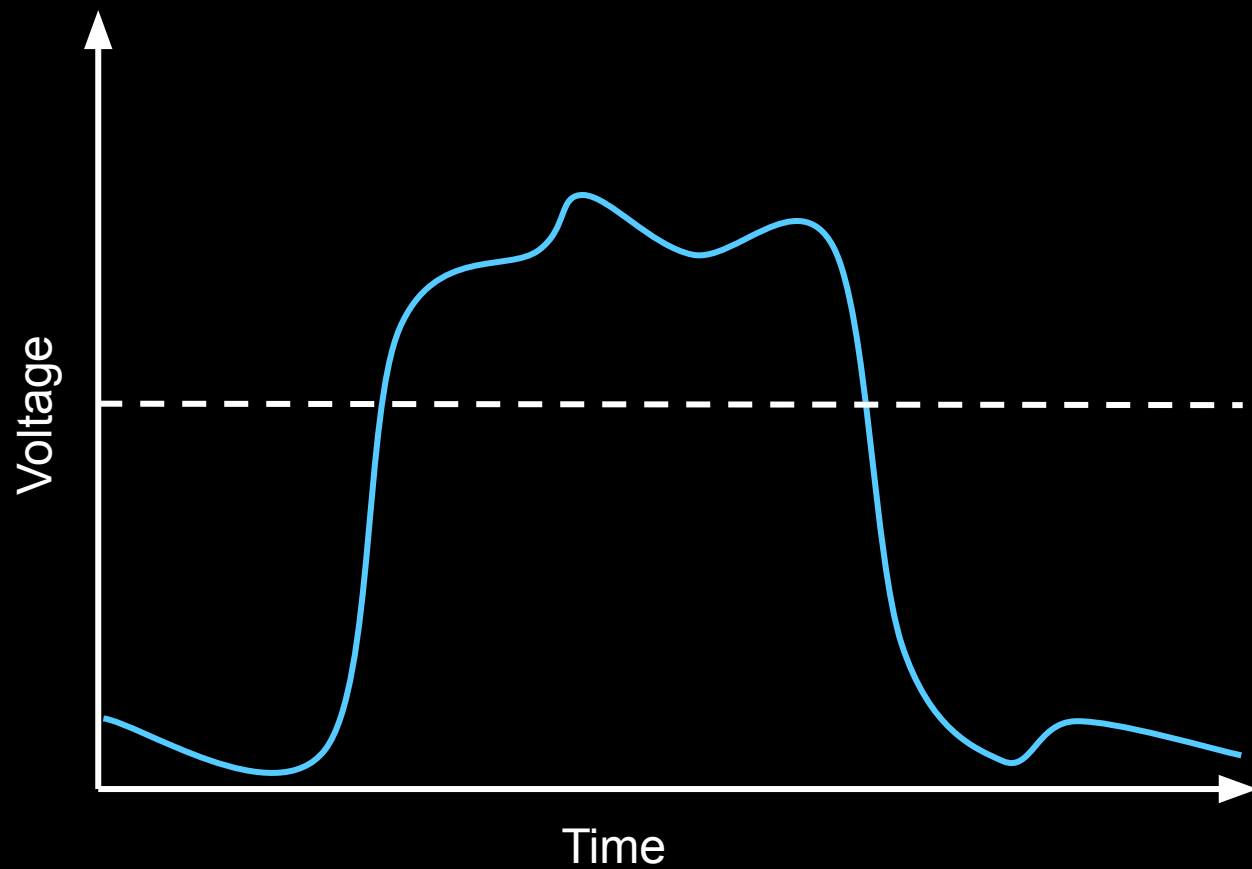


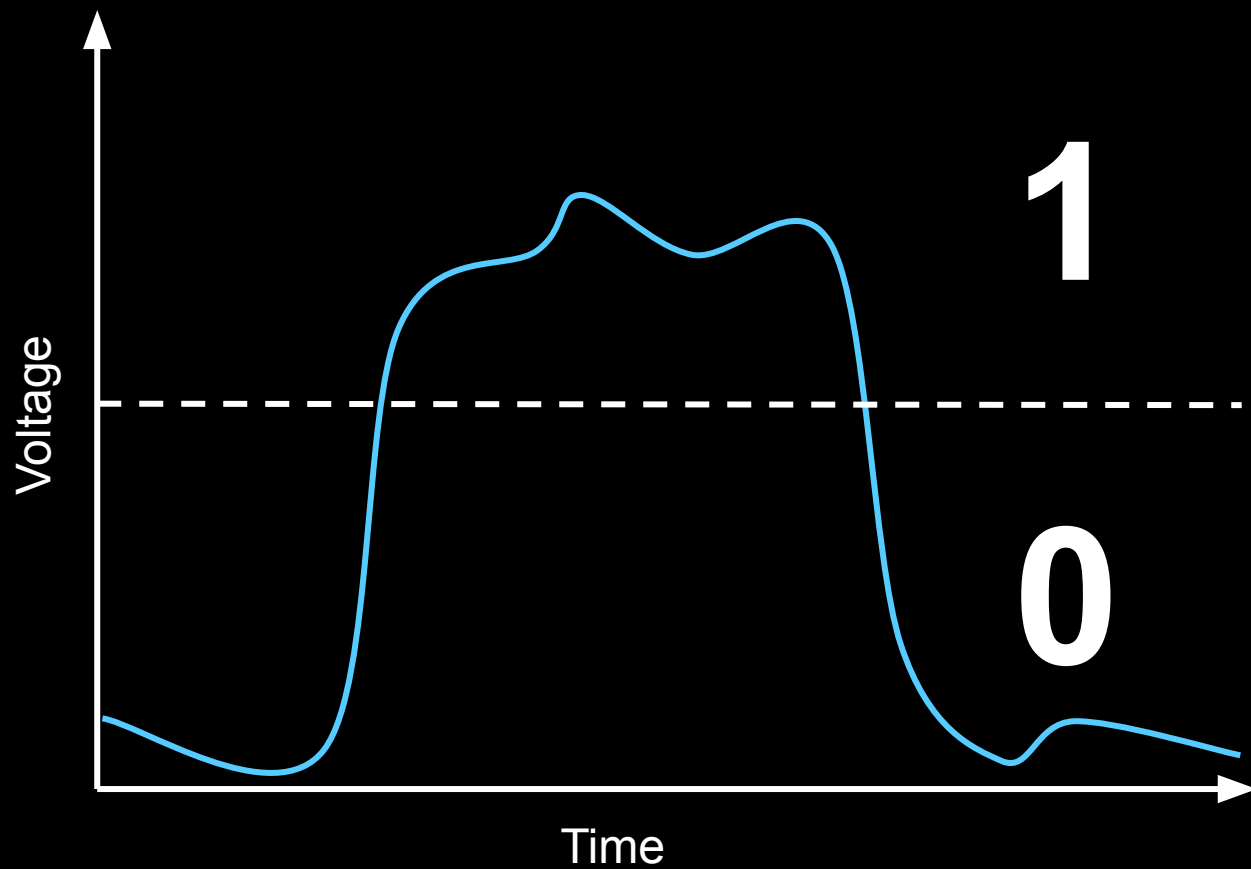


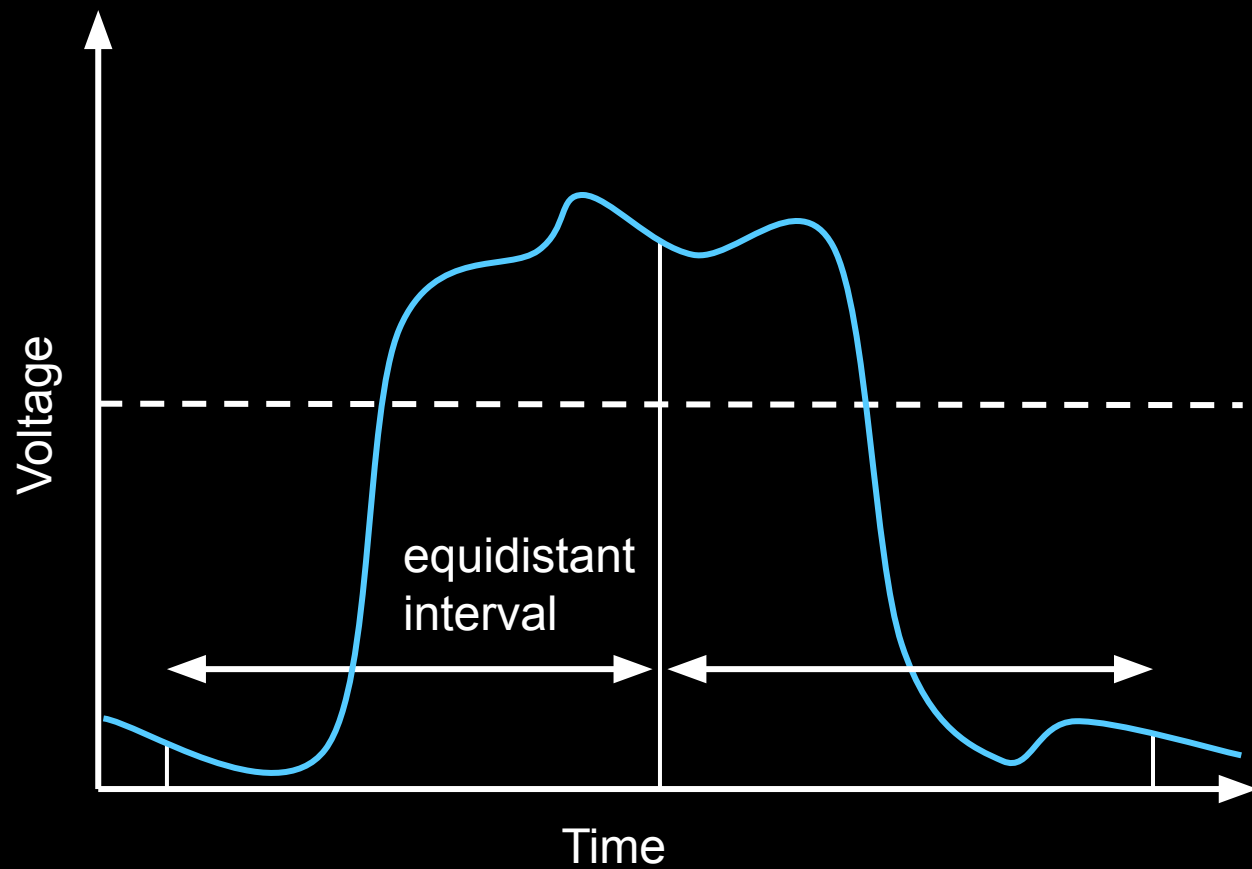


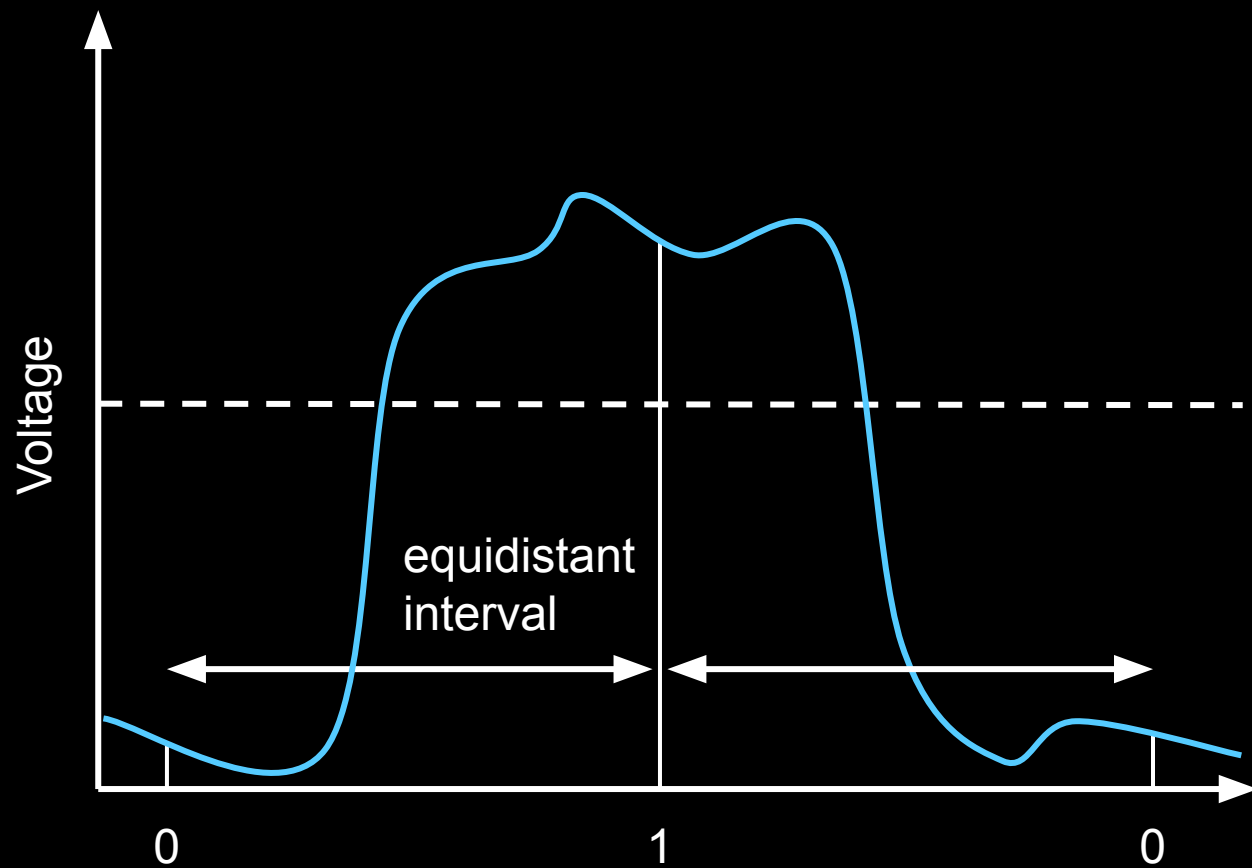


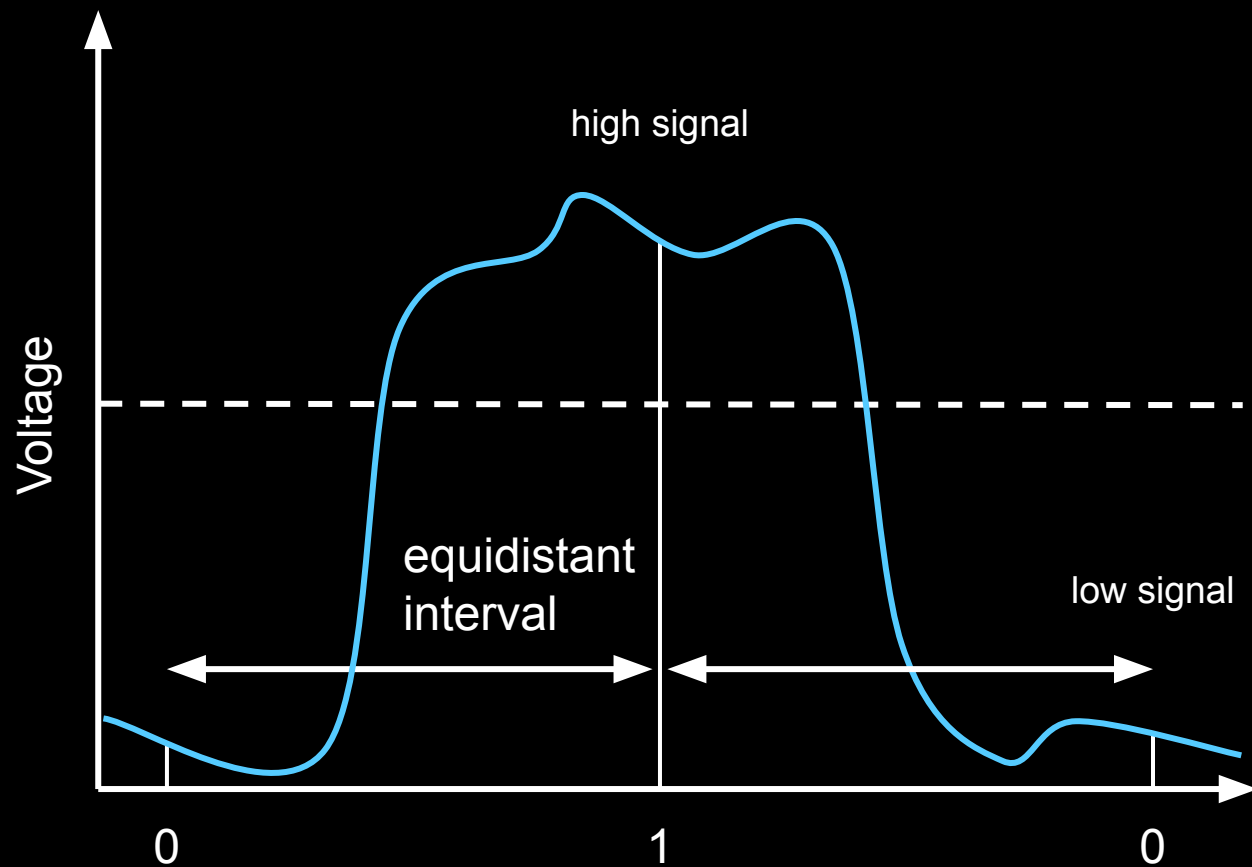






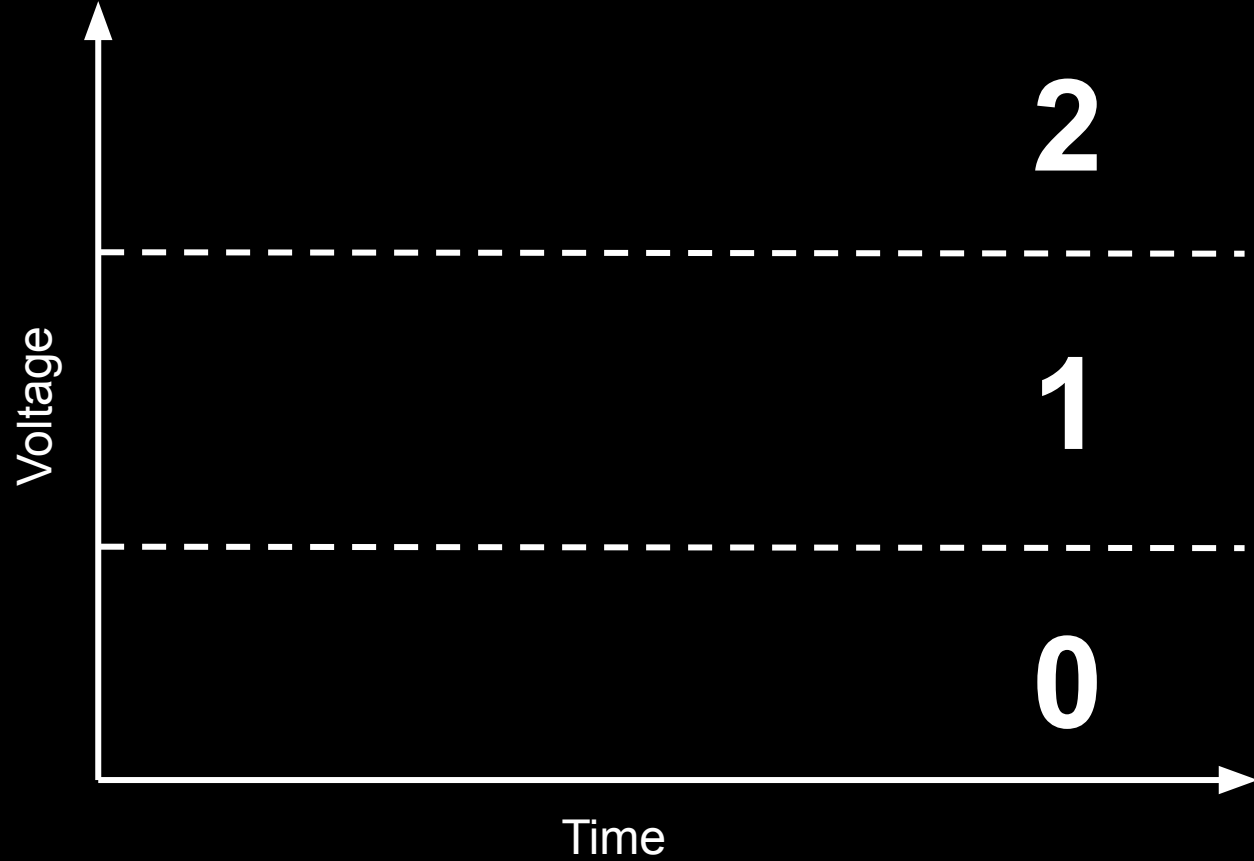


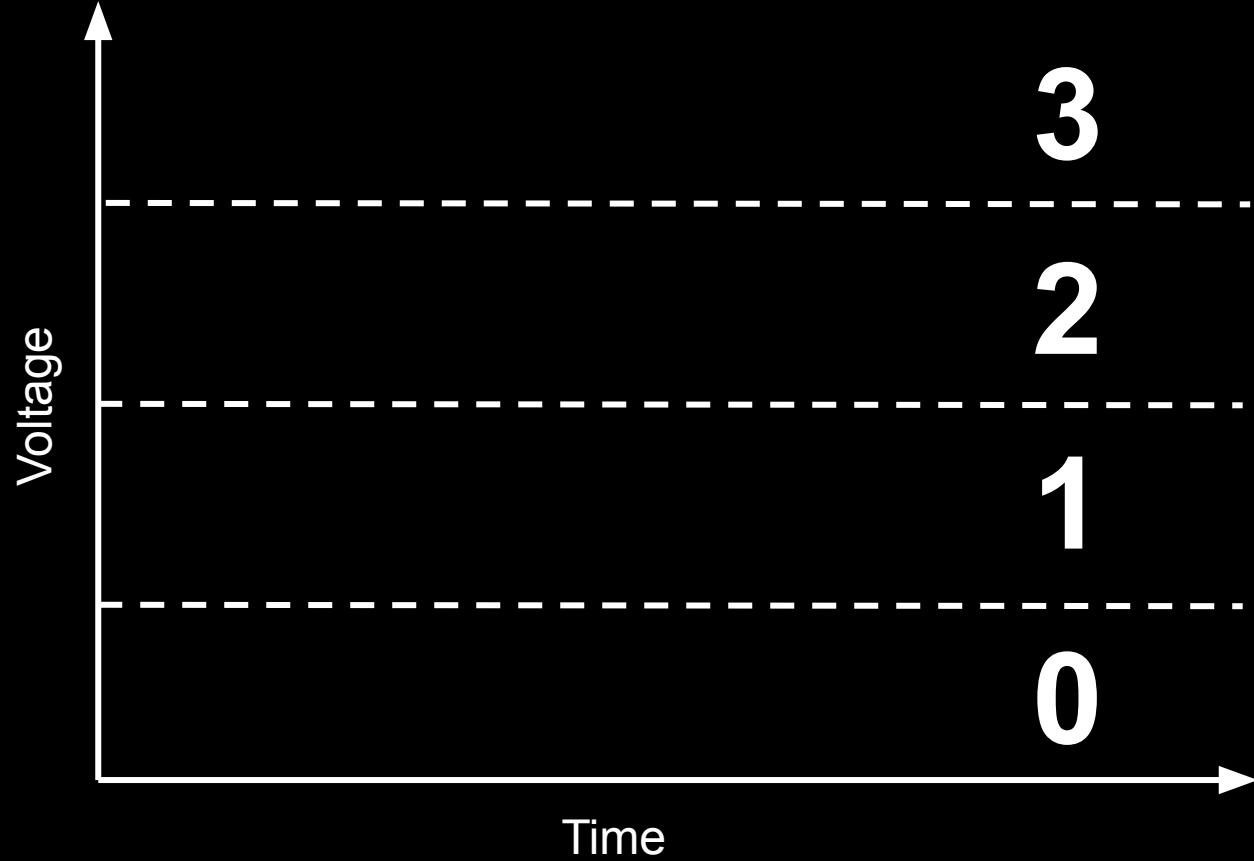


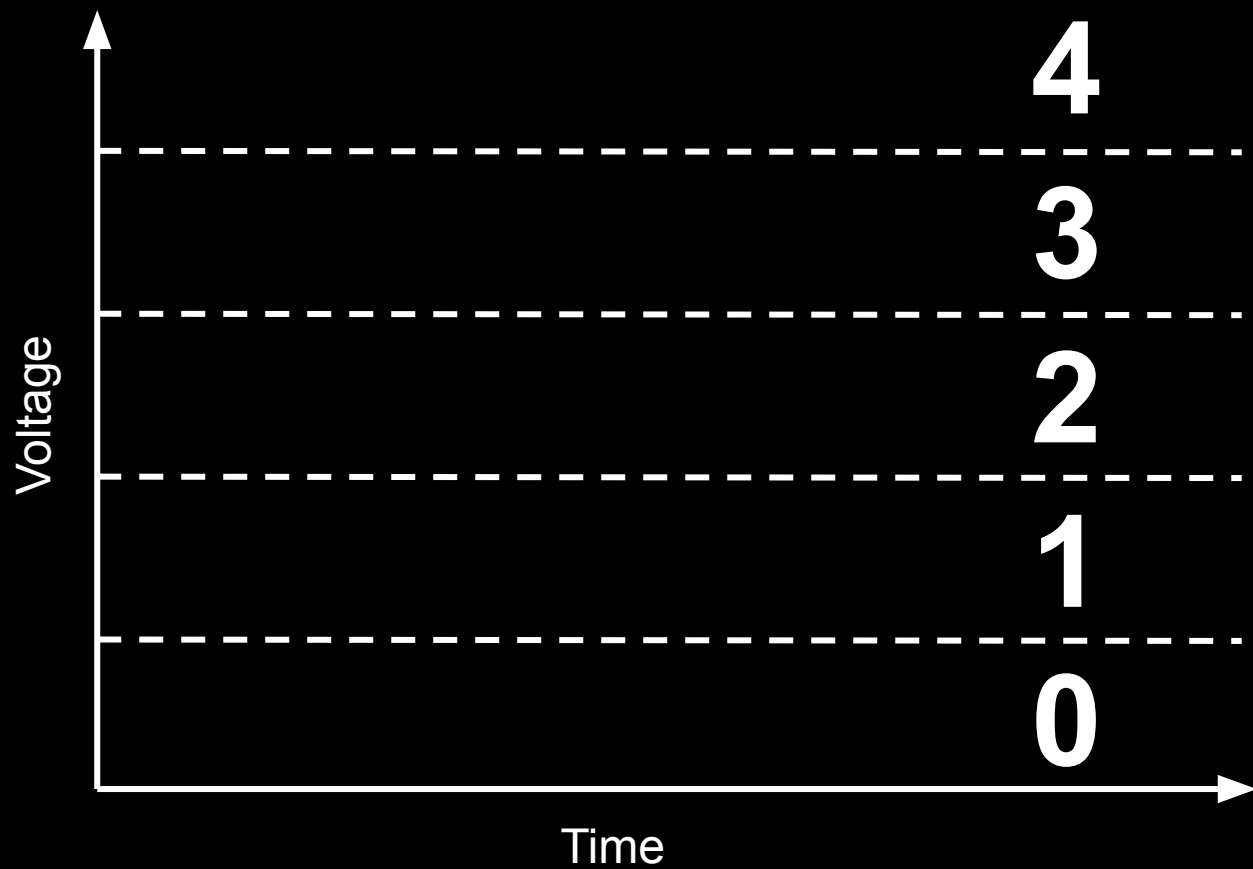


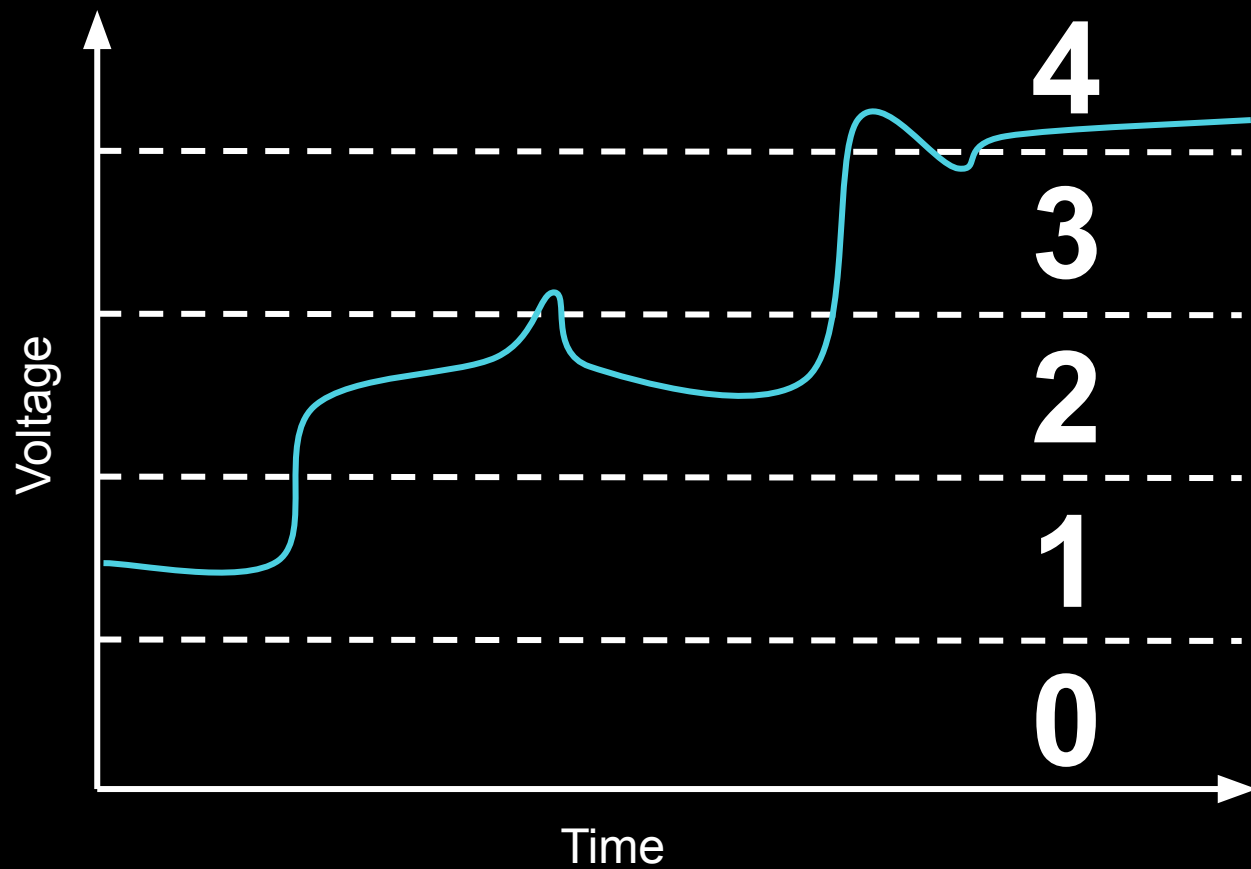
what about  $R > 2$ ?

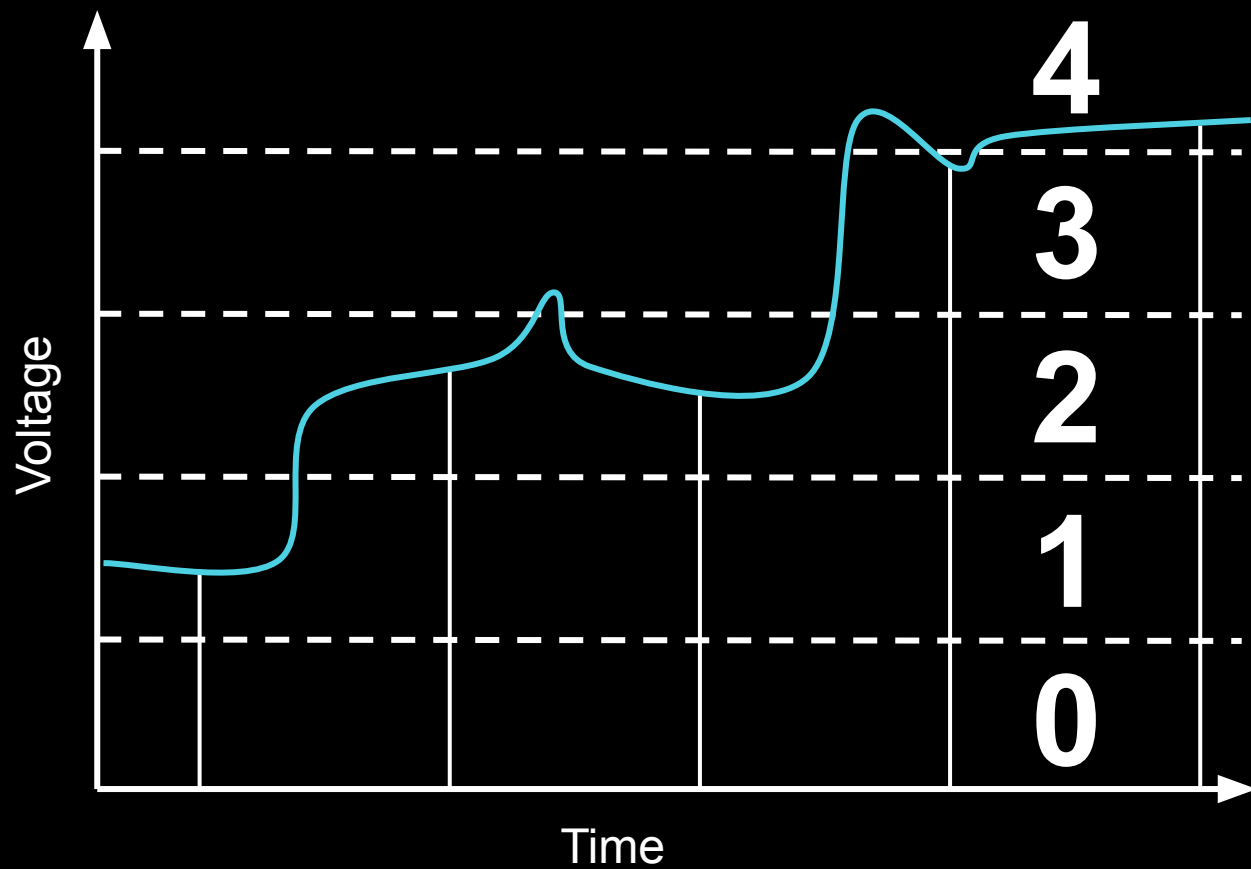


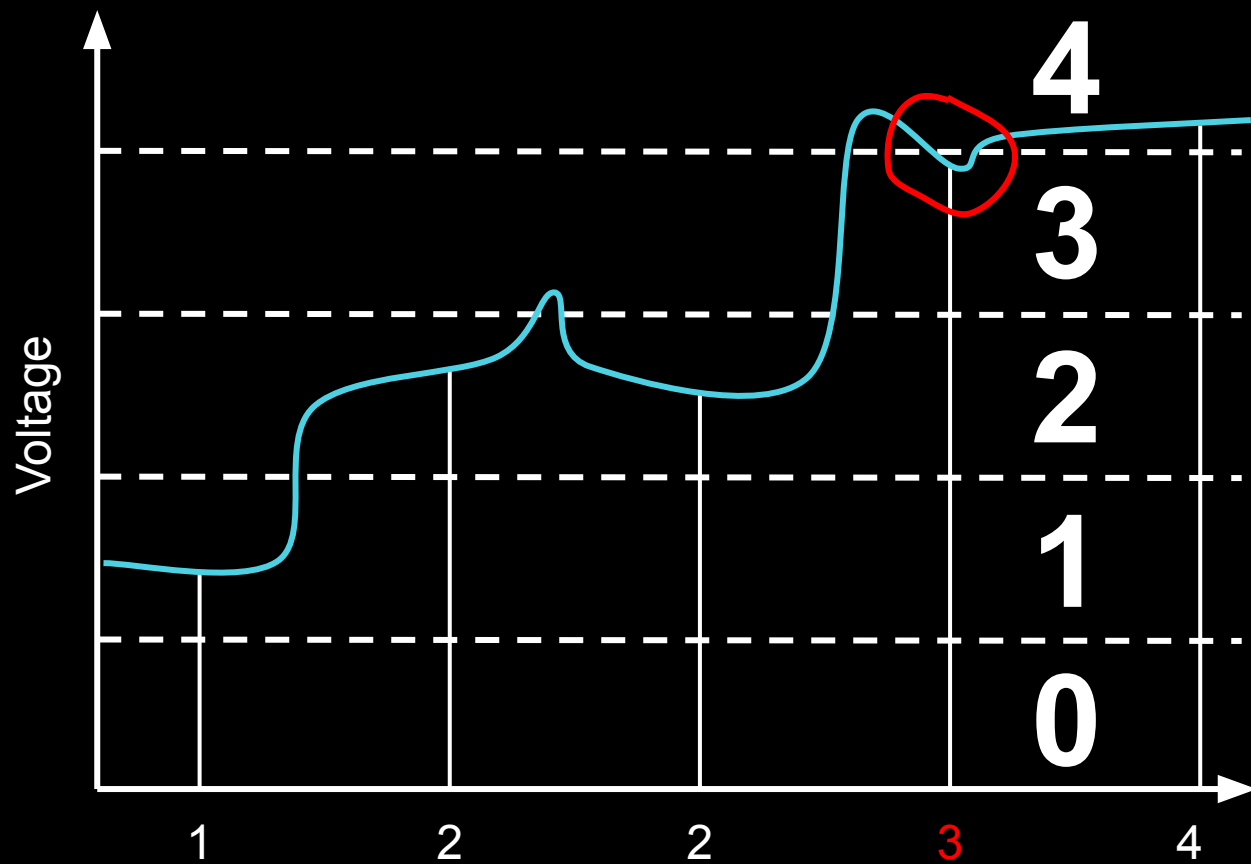












a higher base means less hardware

a higher base means less hardware  
but more complex devices



a higher base means less hardware  
but more complex devices  
and more errors