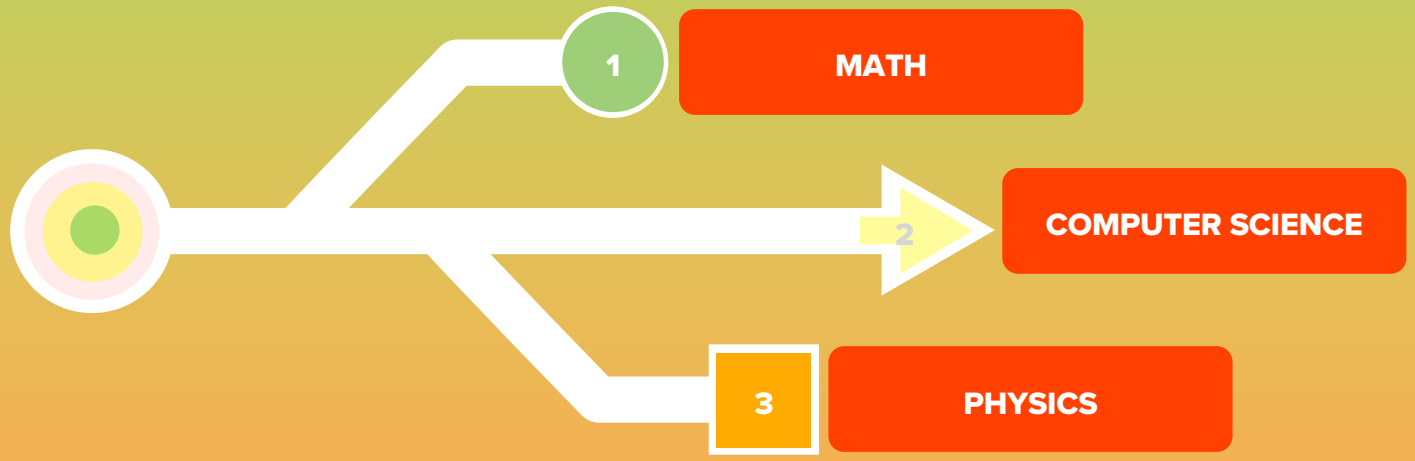
(INFORMATICA PER LE)
DIGITAL HUMANITIES

LECTURE 2
MARCH 1 2024


1
MATH
2
COMPUTER SCIENCE
3
PHYSICS

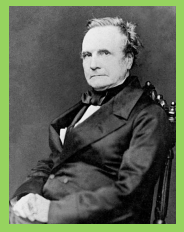

DIGITAL HUMANITIES

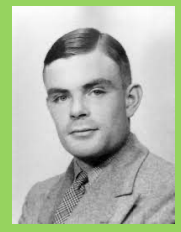
CHAP. 1 - 4

VERDICCHIO M., *L'INFORMATICA PER LA COMUNICAZIONE*, FRANCO ANGELI, MILANO, 2023 (TERZA EDIZIONE)

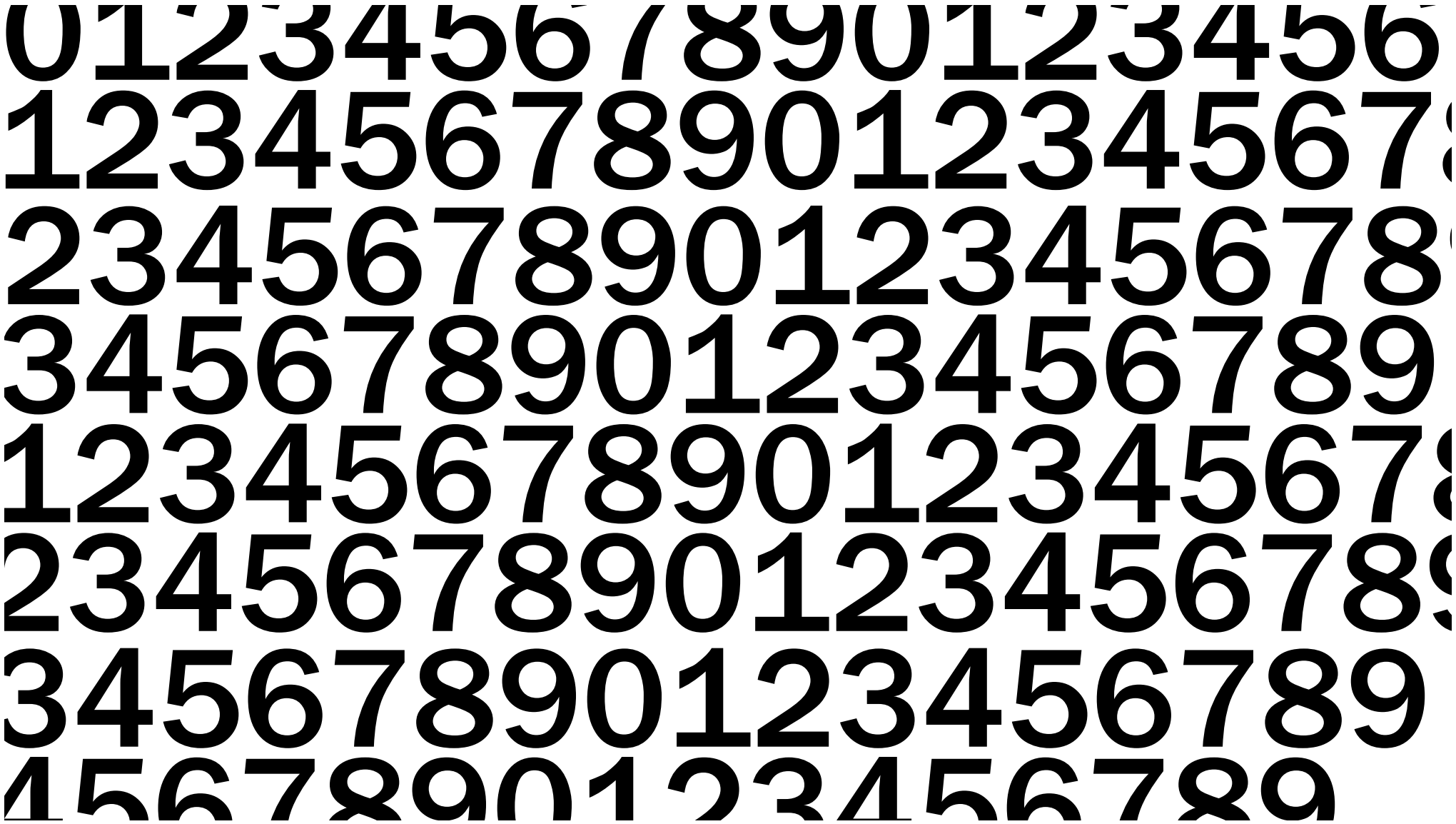
DIGITAL (2-5)

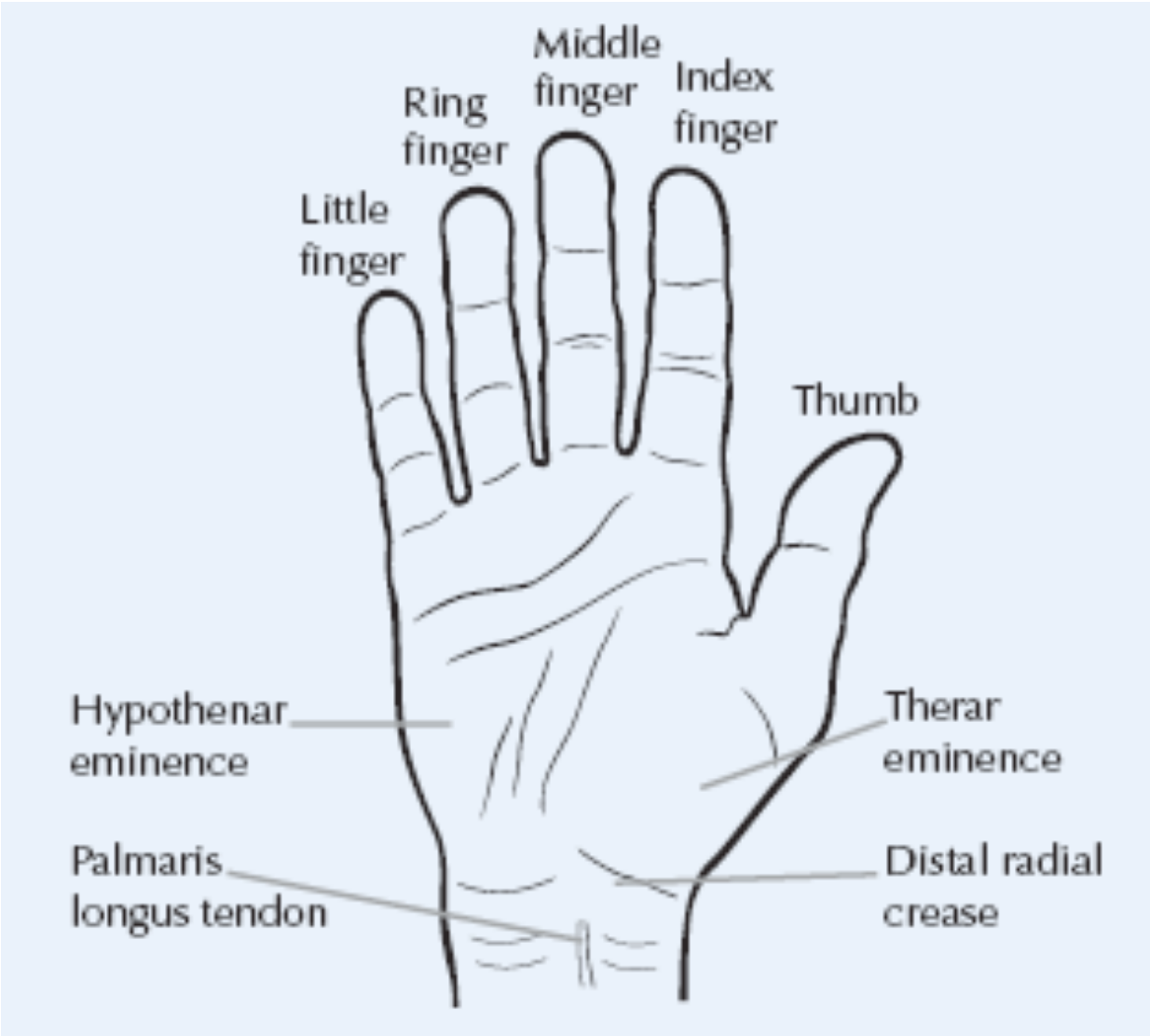
COMPUTATION





Digital


0123456789012345
1234567890123456
2345678901234567
3456789012345678
1234567890123456
2345678901234567
3456789012345678
4567890123456789


Middle finger
Index finger
Ring finger
Little finger
Thumb
Hypothenar eminence
Therar eminence
Palmaris longus tendon
Distal radial crease

3

4

5

5

٥

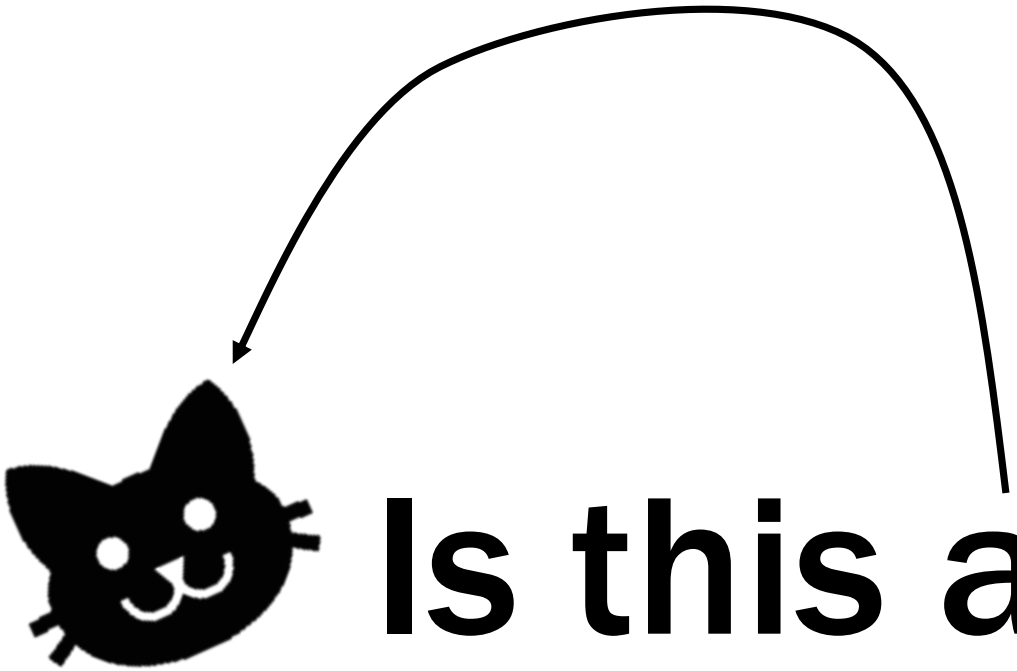
5


5

Digital

Humanities


WAIT!



Is this a cat?

Is this a cat?


Ceci n'est pas une pipe.


“The Treachery of Images” oil on canvas by René Magritte, 1929
Ceci n'est pas une pipe.


Ceci n'est pas une pipe.
Is this a pipe?

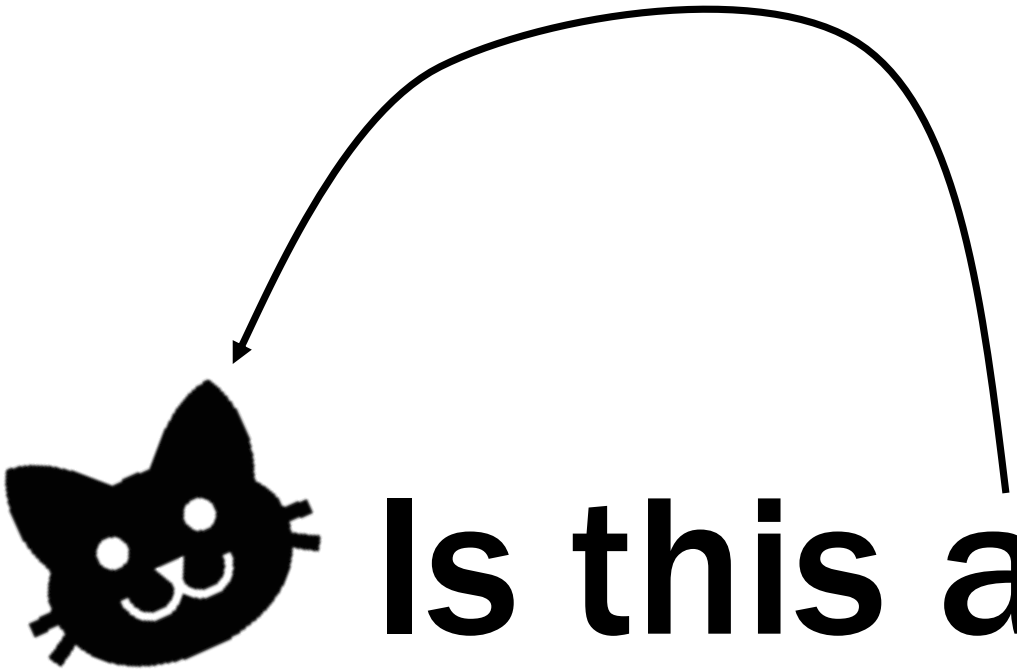
Is this a Swatch?


Ceci n'est pas une pipe
WAIT!


Ceci n'est pas une pipe.

THIS IS NOT A TEXT

“The impossibility of a treachery of texts” ~~oil on canvas~~ by me, today.



Is this a cat?

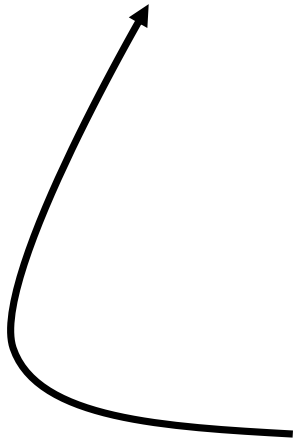
NO!
IT'S AN ICON!

Is this a cat?

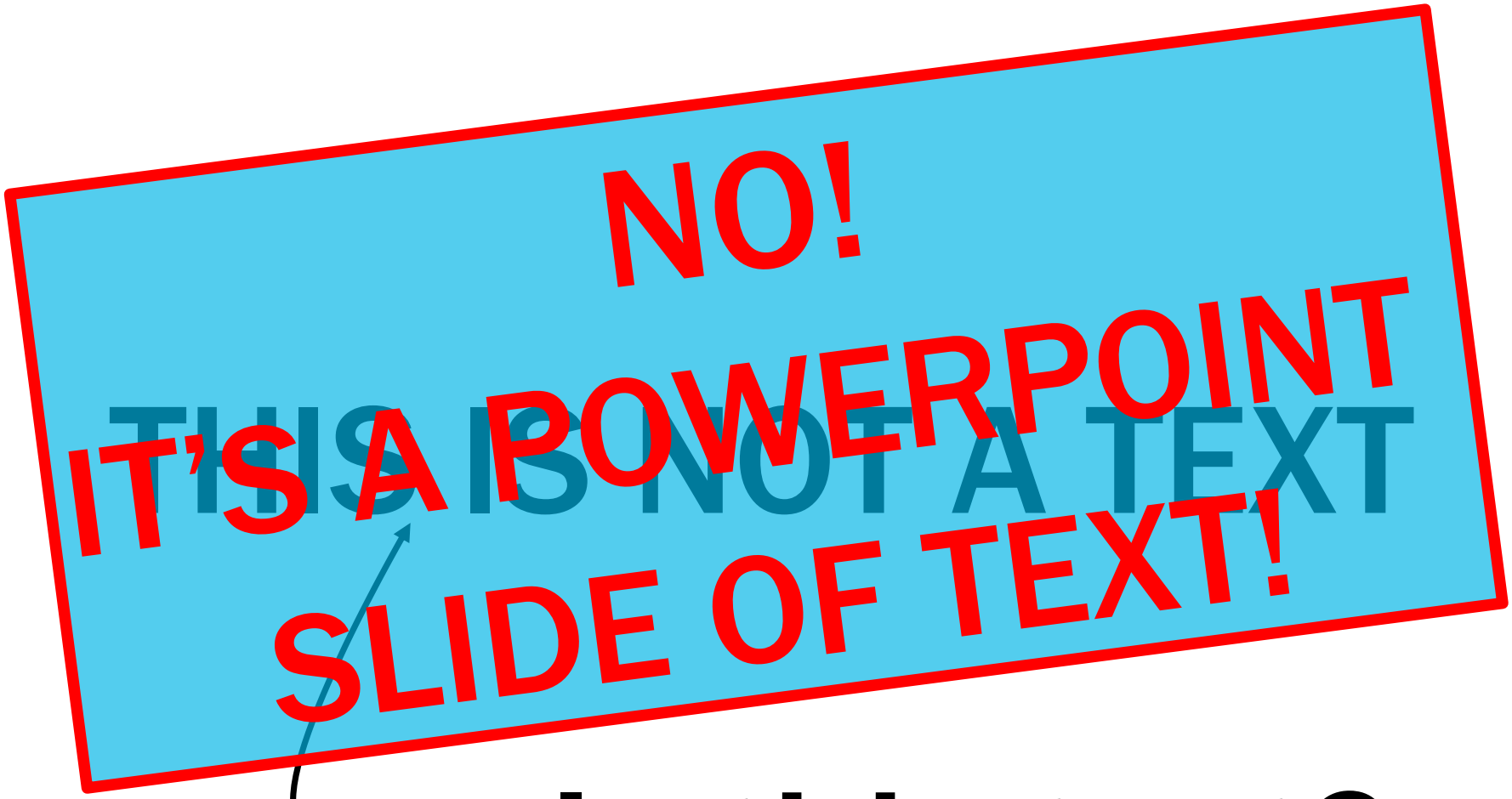
Is this a cat?

Is this a cat?

THIS IS NOT A TEXT



Is this text?



Is this text?


NO!
IT'S POWERPOINT
THIS IS NOT A TEXT
SLIDE OF TEXT!
BUT... YOU CAN
STILL READ IT!

Is this text?

DIGITAL IMAGE OF A CAT

👍 very cute

👍 doesn’t poop

👍 doesn’t need food

👎 cannot cuddle

DIGITAL TEXT

THIS IS NOT A TEXT

DIGITAL TEXT

THIS IS NOT A TEXT

👍 you can read it

THIS IS TEXT

What is the difference?

Physical cats
exist.
On the left,
a physical cat is
depicted.
A depiction of a cat
is not a cat.

Does physical text exist? Whether it exists or not, on the right

THIS IS TEXT

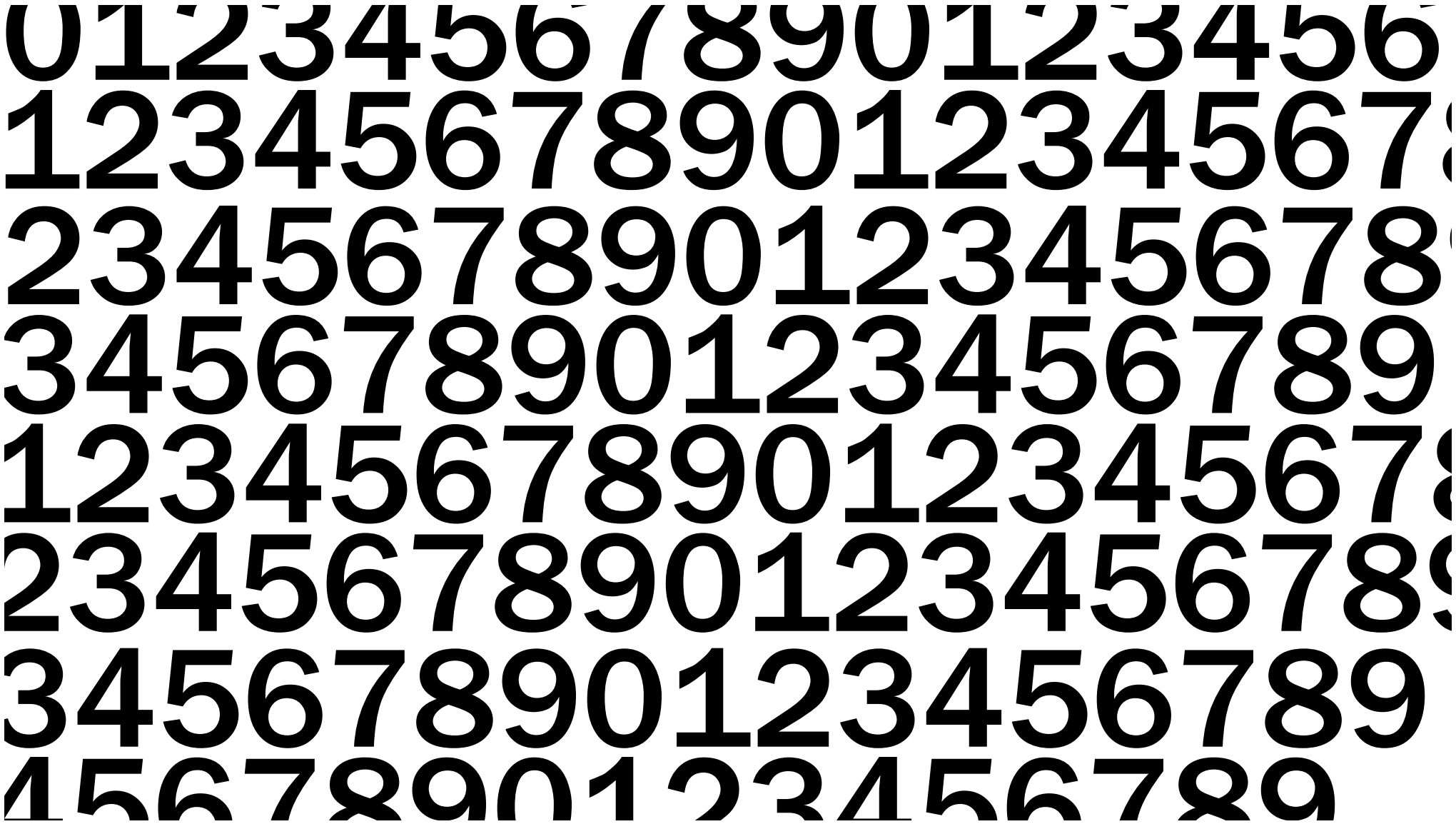
is a depiction of text. A depiction of text is also text.

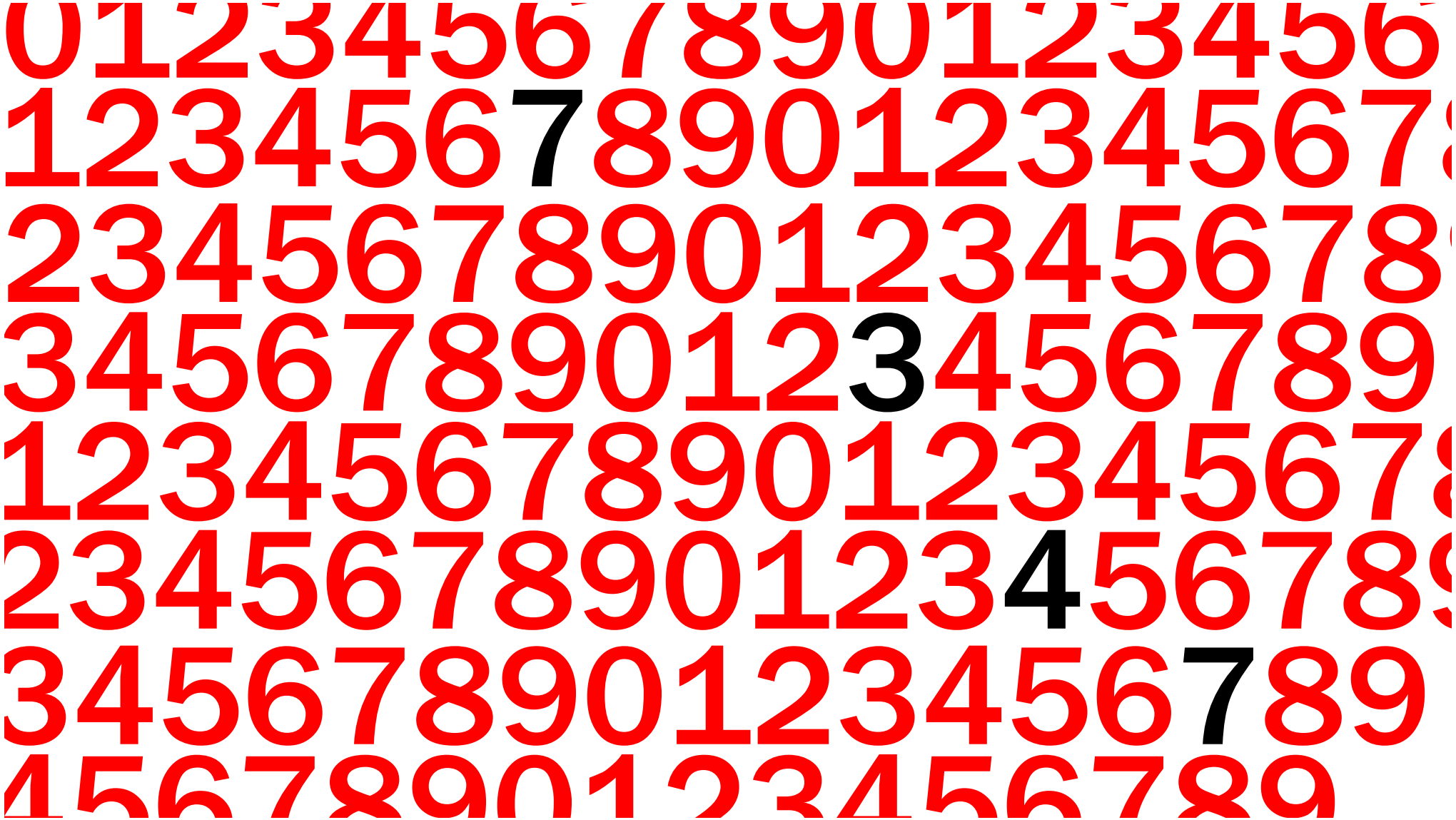
“Love” sculpture by Robert Indiana, 1970

“Love” US postage stamp design by Robert Indiana, 1973


THIS
IS
TEXT


SIGNS
PEOPLE
AGREE
ON


0123456789012345
1234567890123456
2345678901234567
3456789012345678
1234567890123456
2345678901234567
3456789012345678
4567890123456789


0123456789012345678
1234567890123456789
2345678901234567890
3456789012345678901
4567890123456789012
5678901234567890123
6789012345678901234
7890123456789012345

TEXT

ANALYSIS
ANNOTATION
CONVERSION
EDITING
ENCODING
MINING
PROCESSING
RECOGNITION
TRANSCRIPTION
VISUALIZATION

TEXT

ANALYSIS
ANNOTATION
CONVERSION
EDITING
ENCODING
MINING
PROCESSING
RECOGNITION
TRANSCRIPTION
VISUALIZATION

ENCODING
is
EVERYTHING*

ENCODING
is
EVERYTHING*

*in digital technology

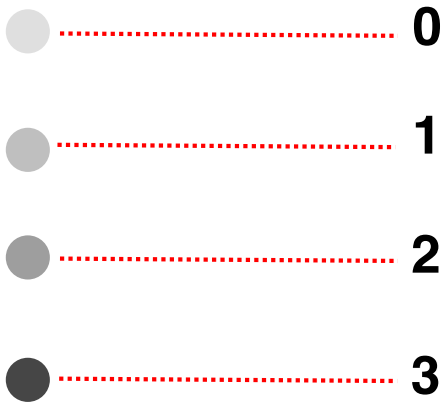
ENCODING [ɪnˈkəʊdɪŋ]: biunivocal correspondence between a set of entities of any kind and a set of natural numbers.

biunivocal correspondence

between a set of entities of any kind

and a set of natural numbers.

ENCODING



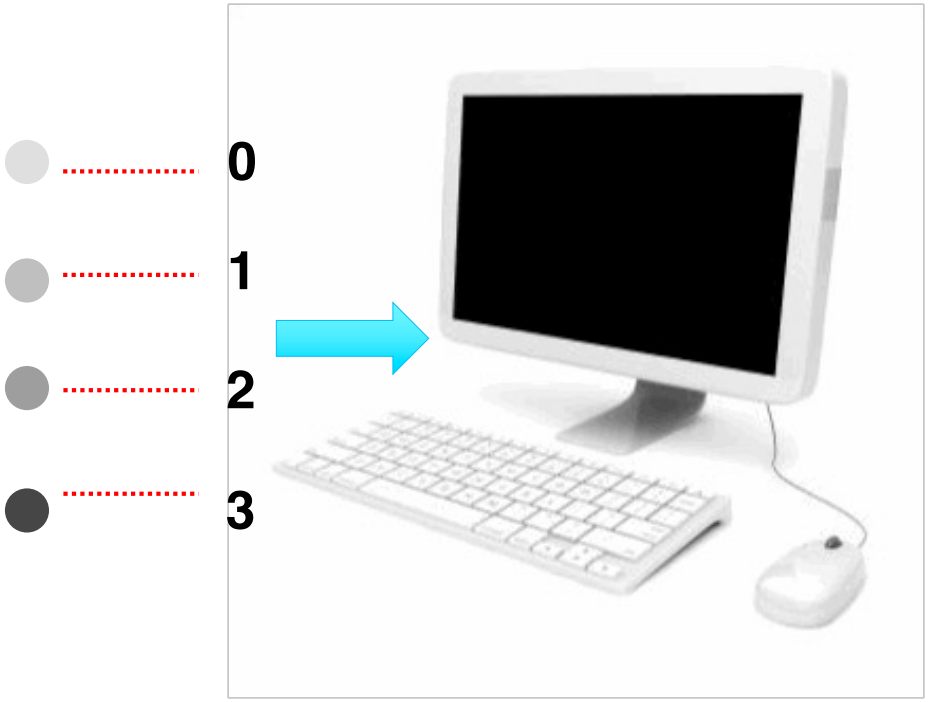

That's all Folks! *

***from a conceptual perspective**

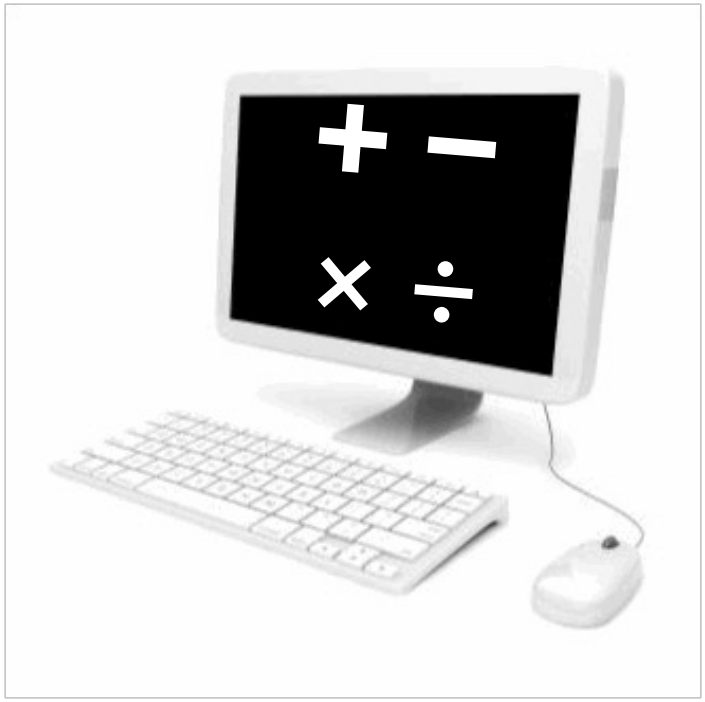
A computer.

It only works with numbers.

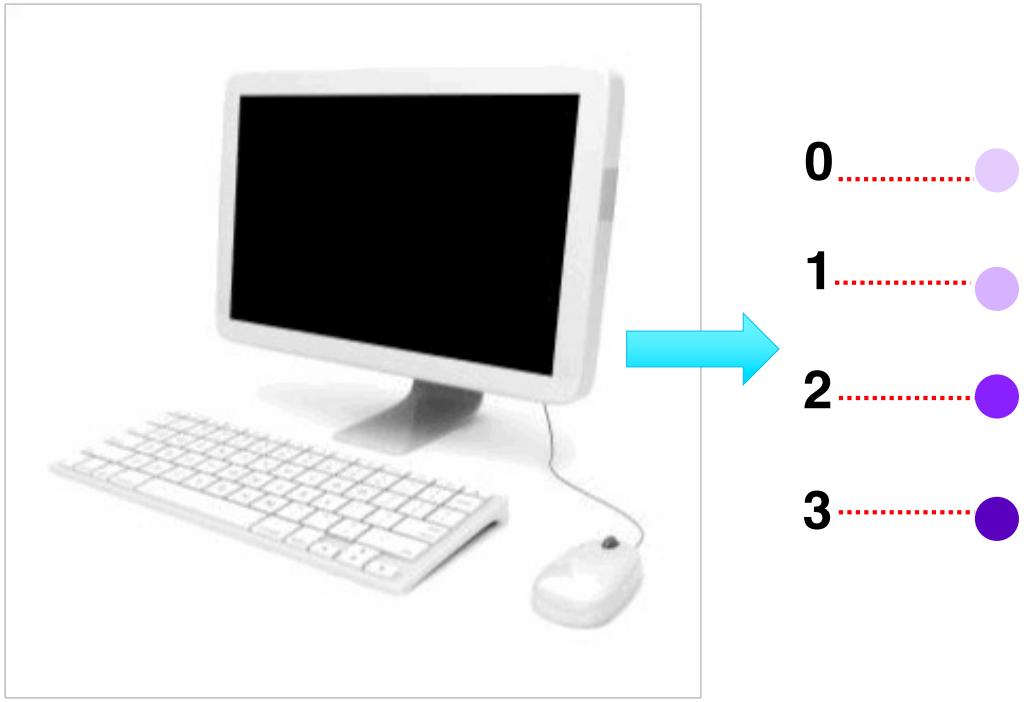
It cannot work with anything else.



Input needs to be ENCODED.



The computer works.

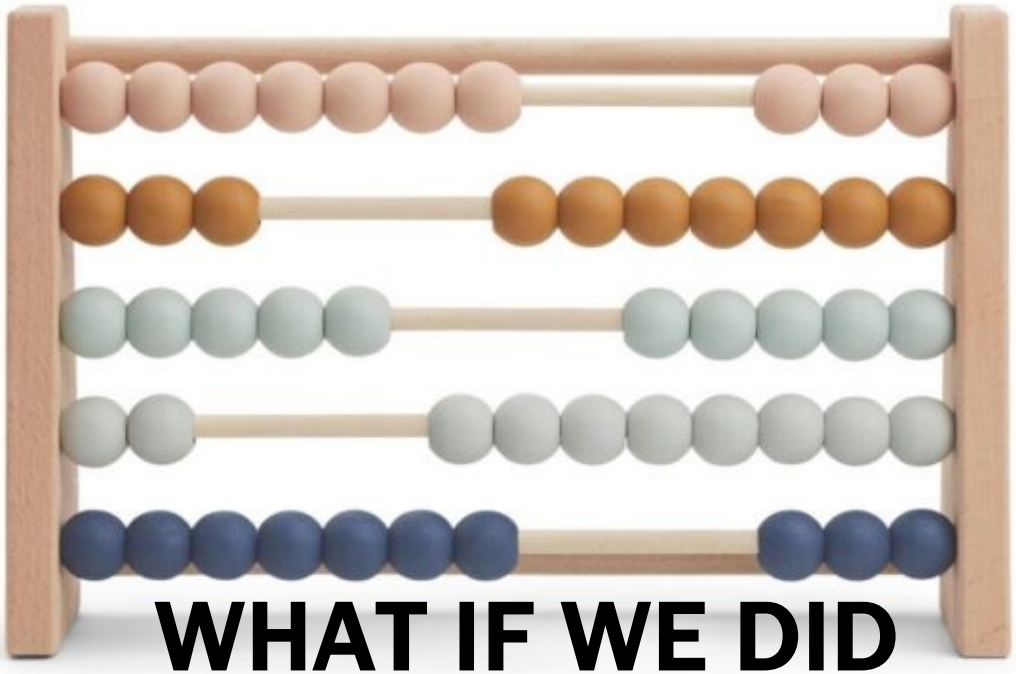


Output needs to be DECODED.

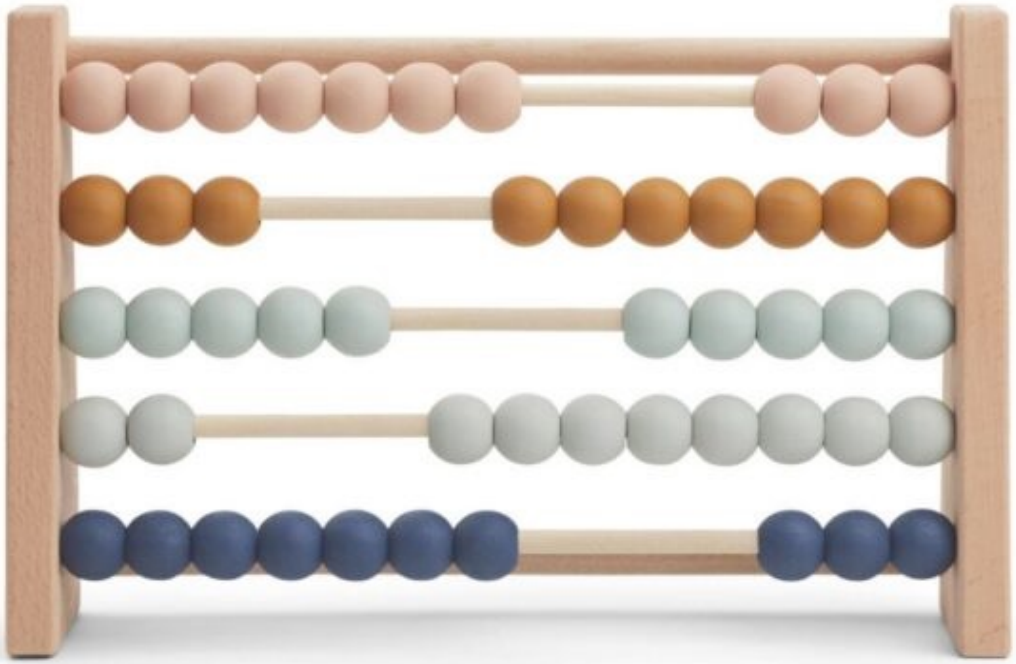
COMPUTER SCIENCE

WAIT!

THIS IS HOW DIGITAL TECHNOLOGY WORKS

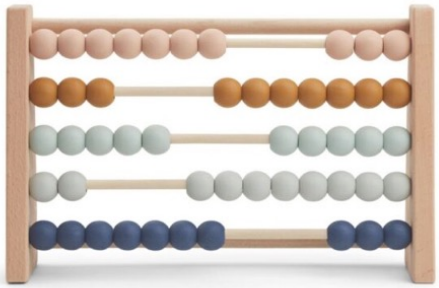


WHAT IF WE DID COMPUTATION ON AN ABACUS?

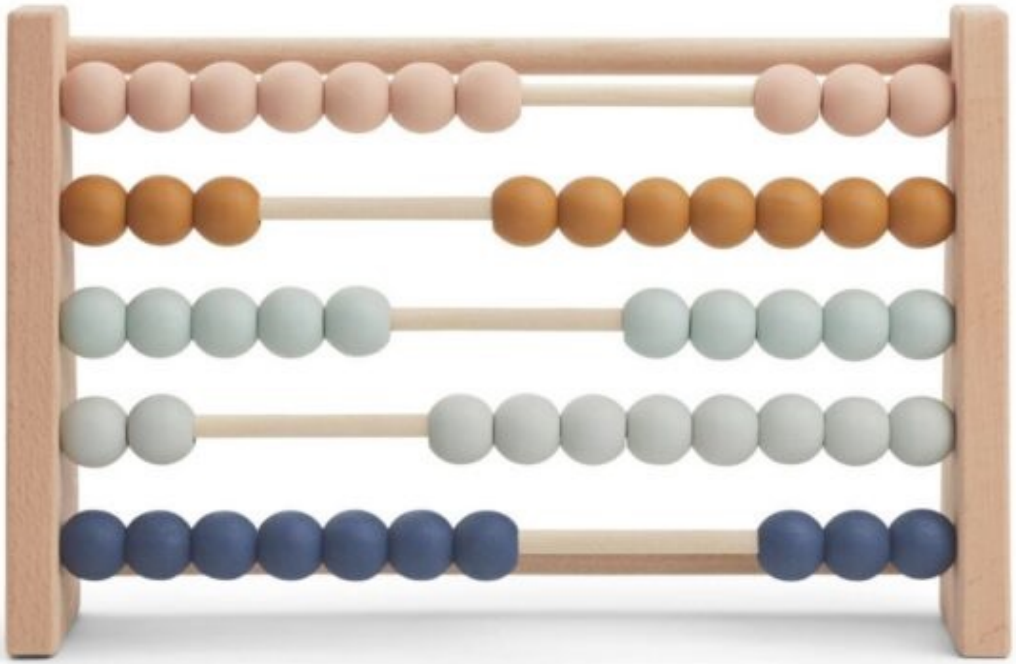


ABACUS:
THE OTHER ANALOG COMPUTER


FINGERS:
THE FIRST ANALOG COMPUTER

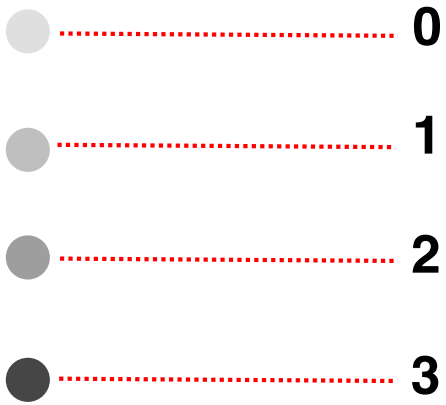


VS.

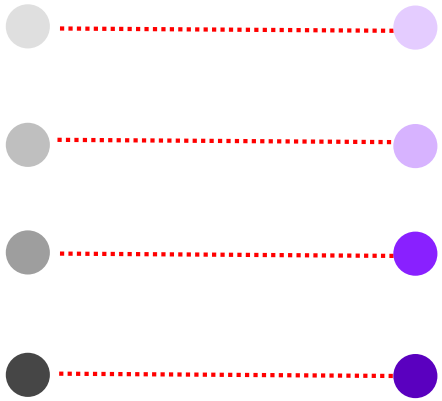


WHAT IF WE DID COMPUTING ON ABACUSES? (ABACI?)

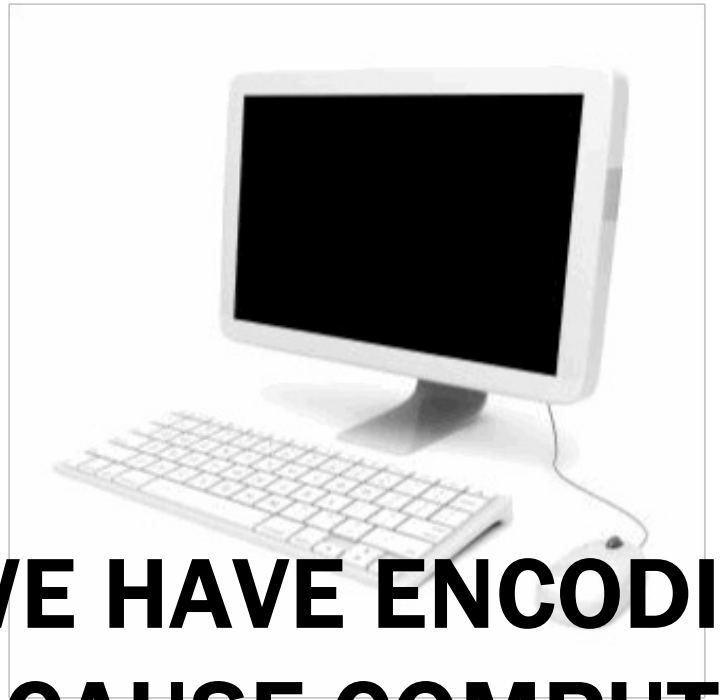
ENCODING?



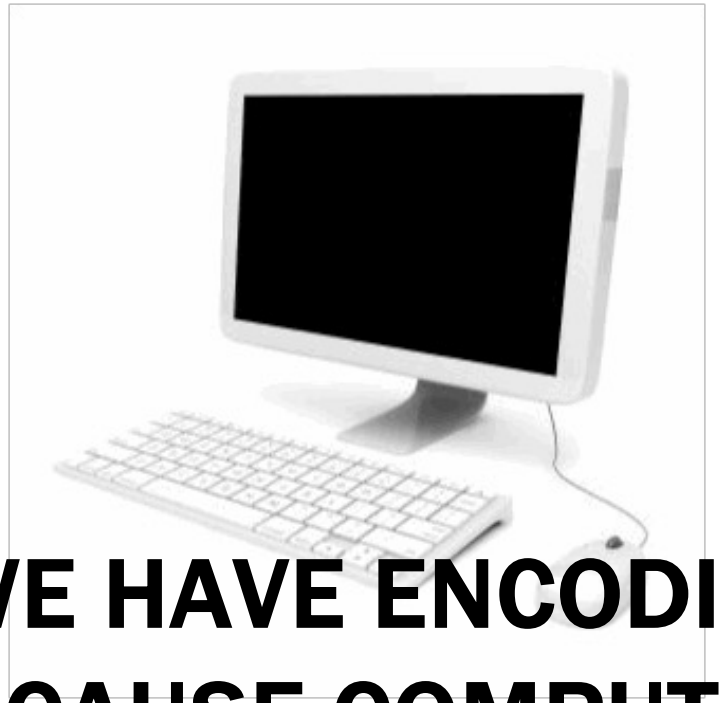
~~ENCODING?~~



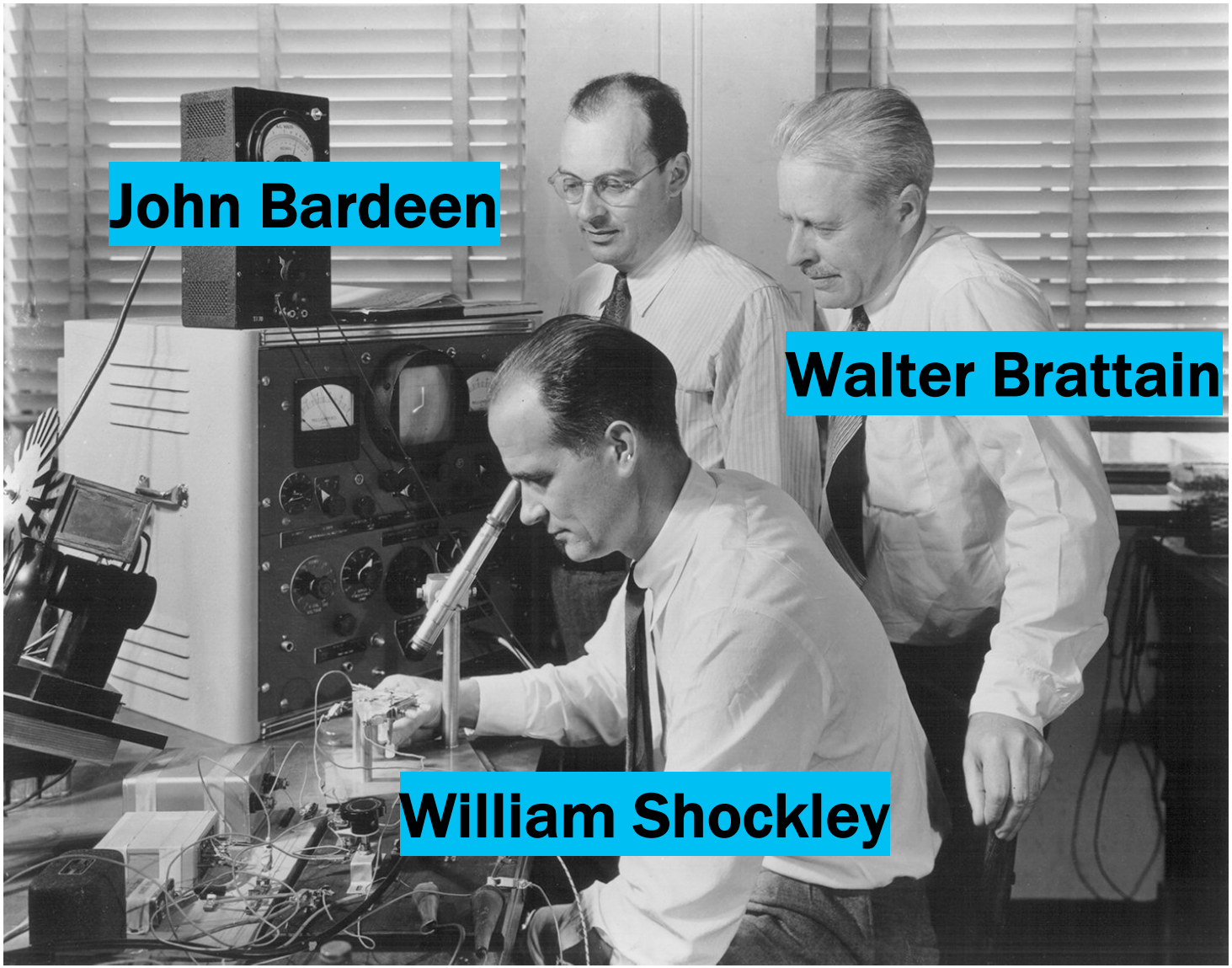
~~ENCODING?~~



WE HAVE ENCODING BECAUSE COMPUTERS ARE DIGITAL



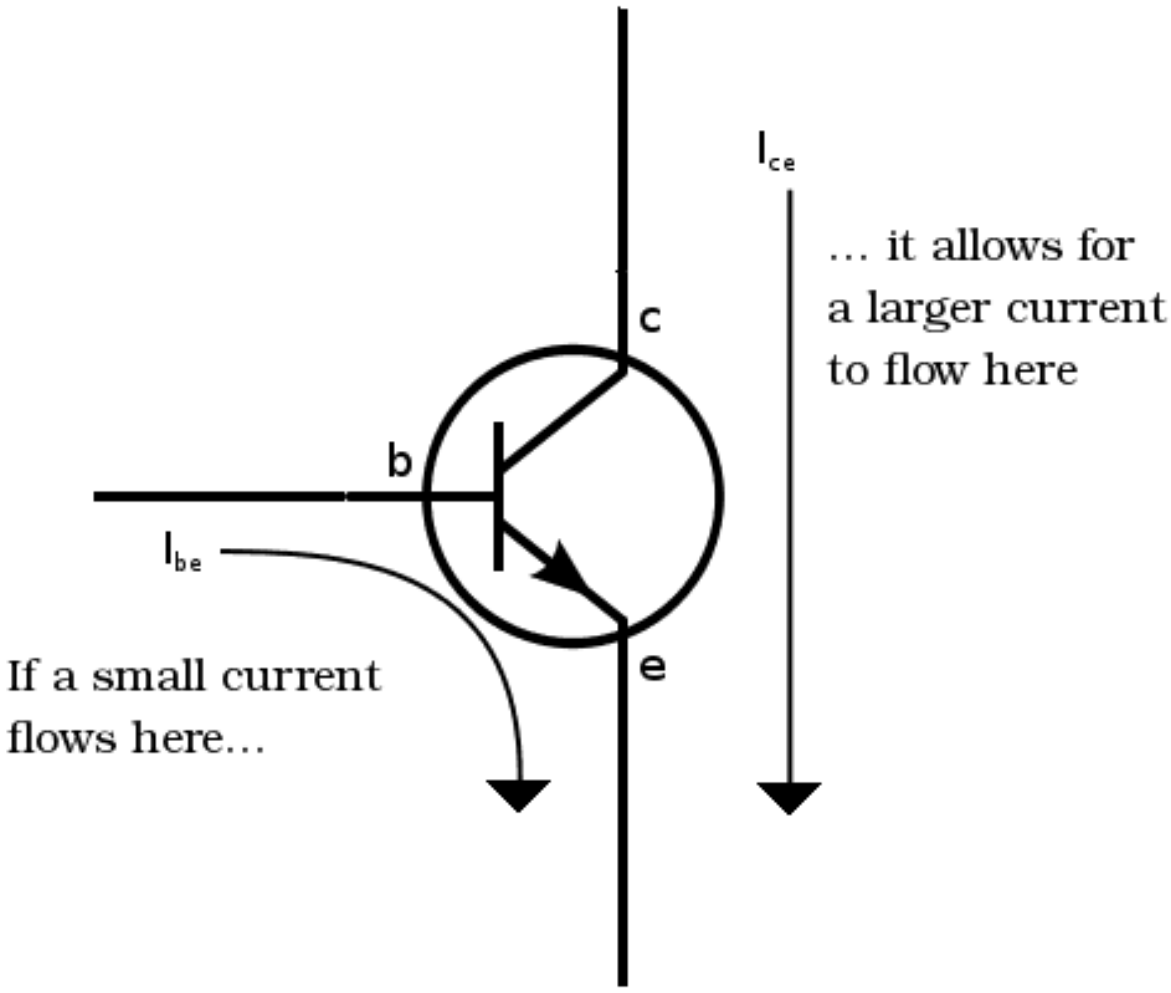
WE HAVE ENCODING
BECAUSE COMPUTERS
HAPPEN TO BE DIGITAL

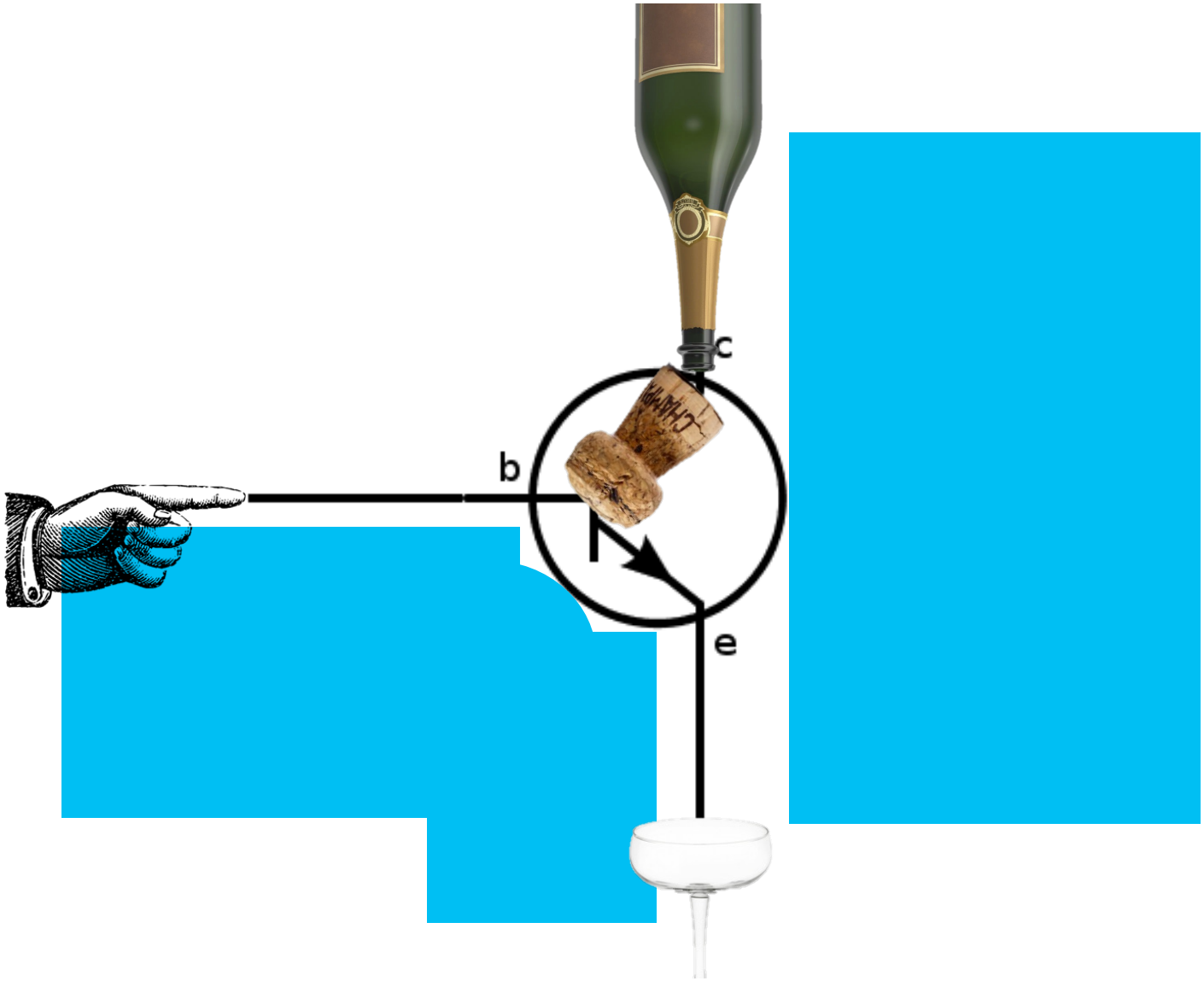

John Bardeen
Walter Brattain
William Shockley

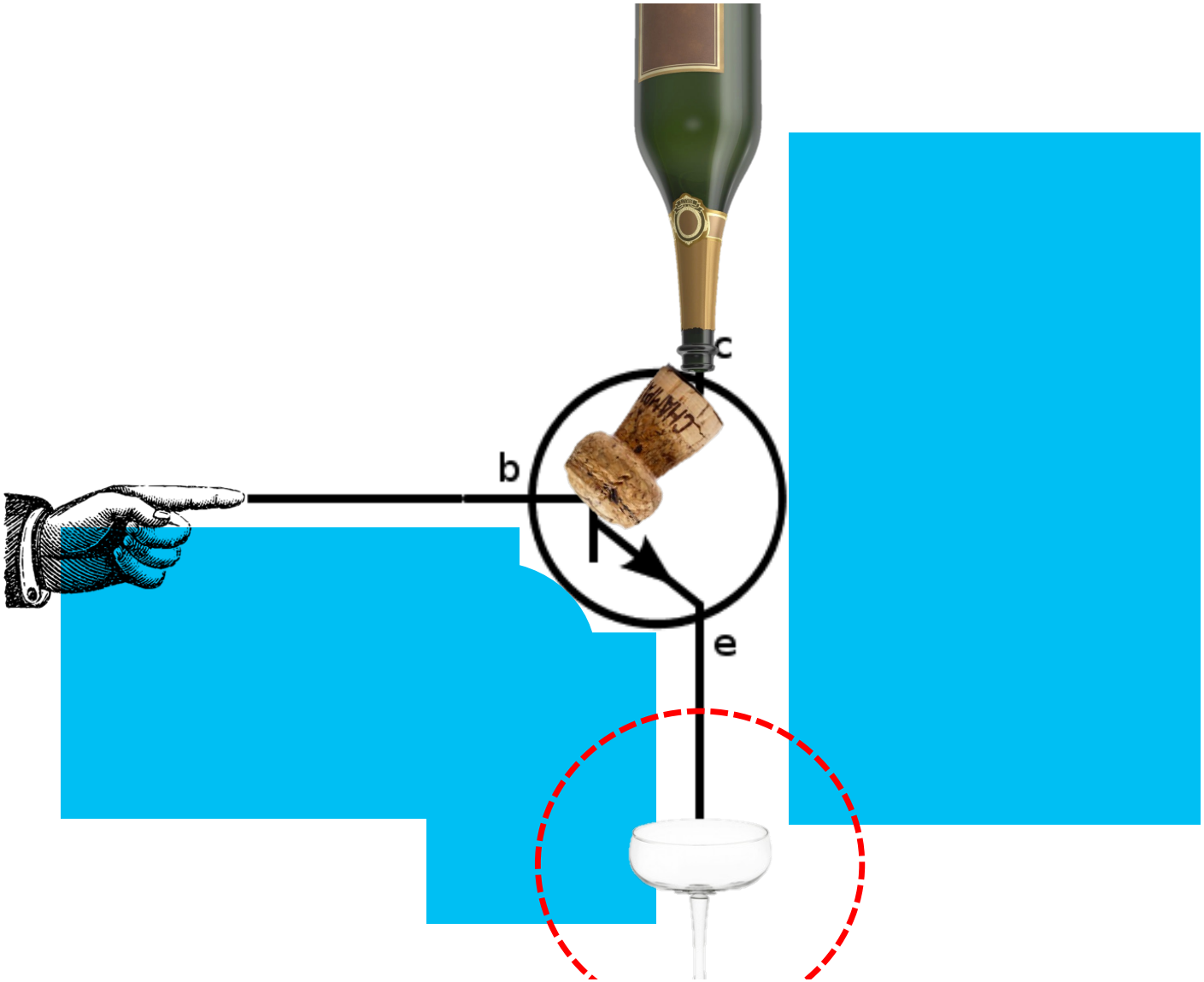
THEY INVENTED THE TRANSISTOR

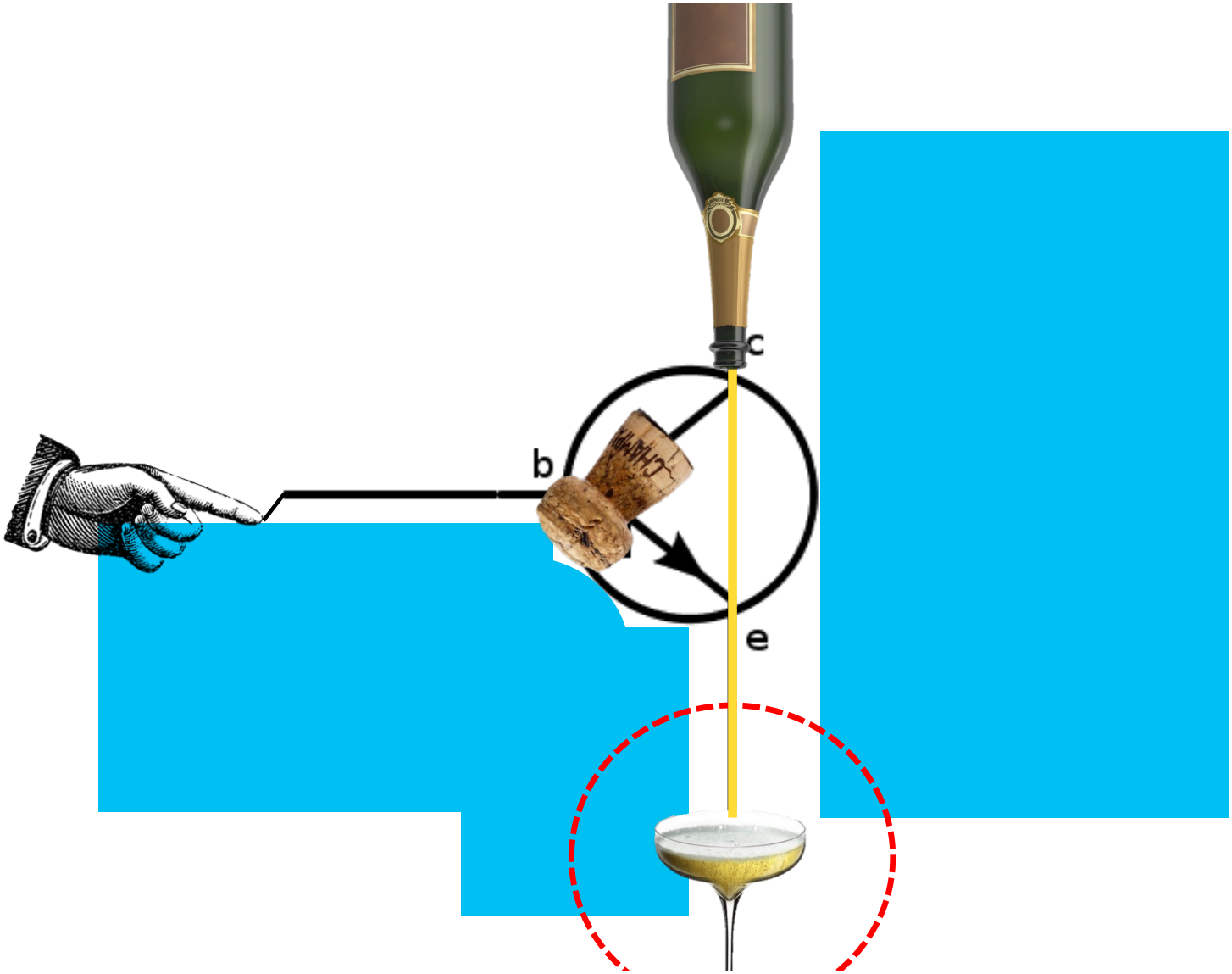
AND GOT A NOBEL PRIZE*

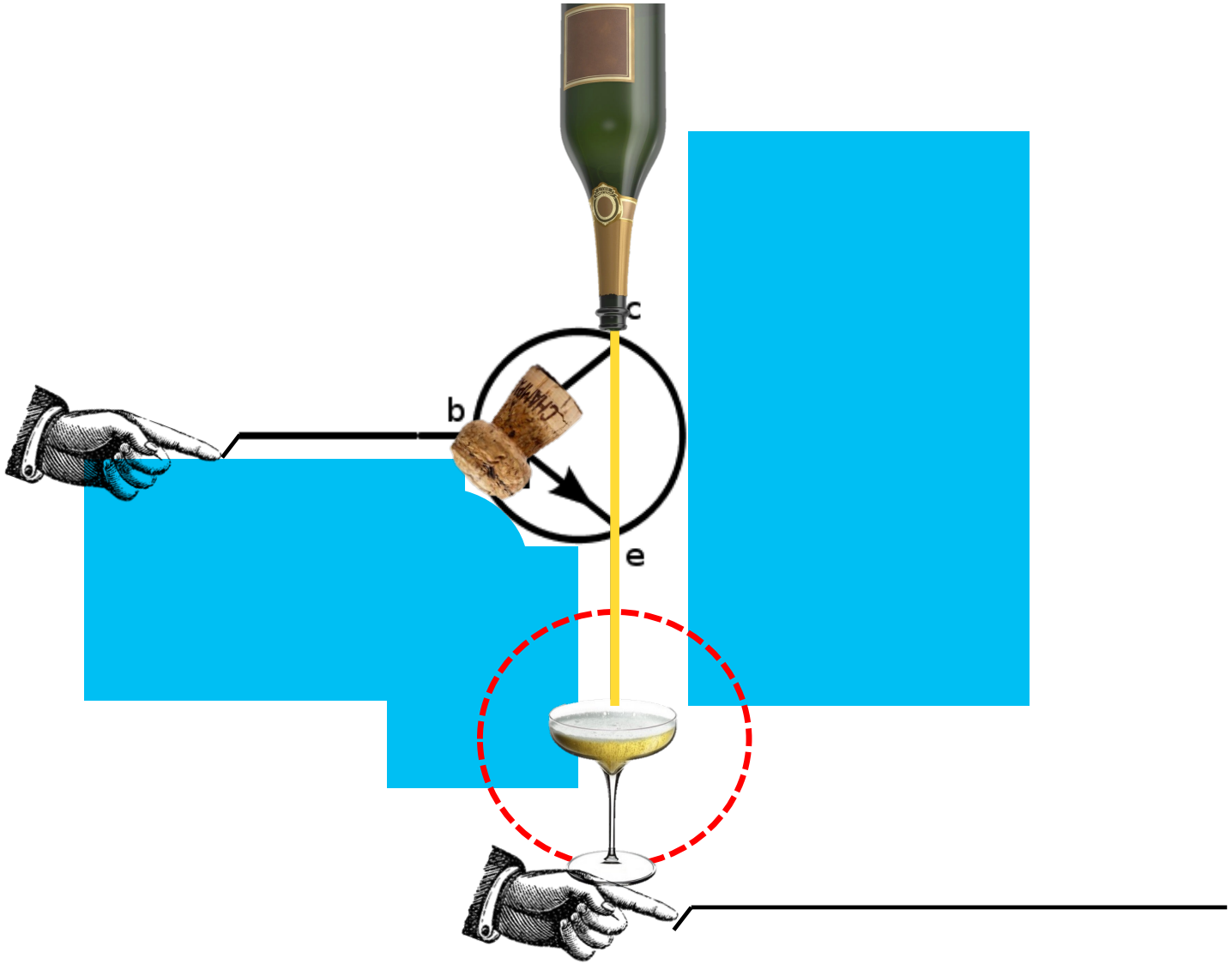
*IN PHYSICS

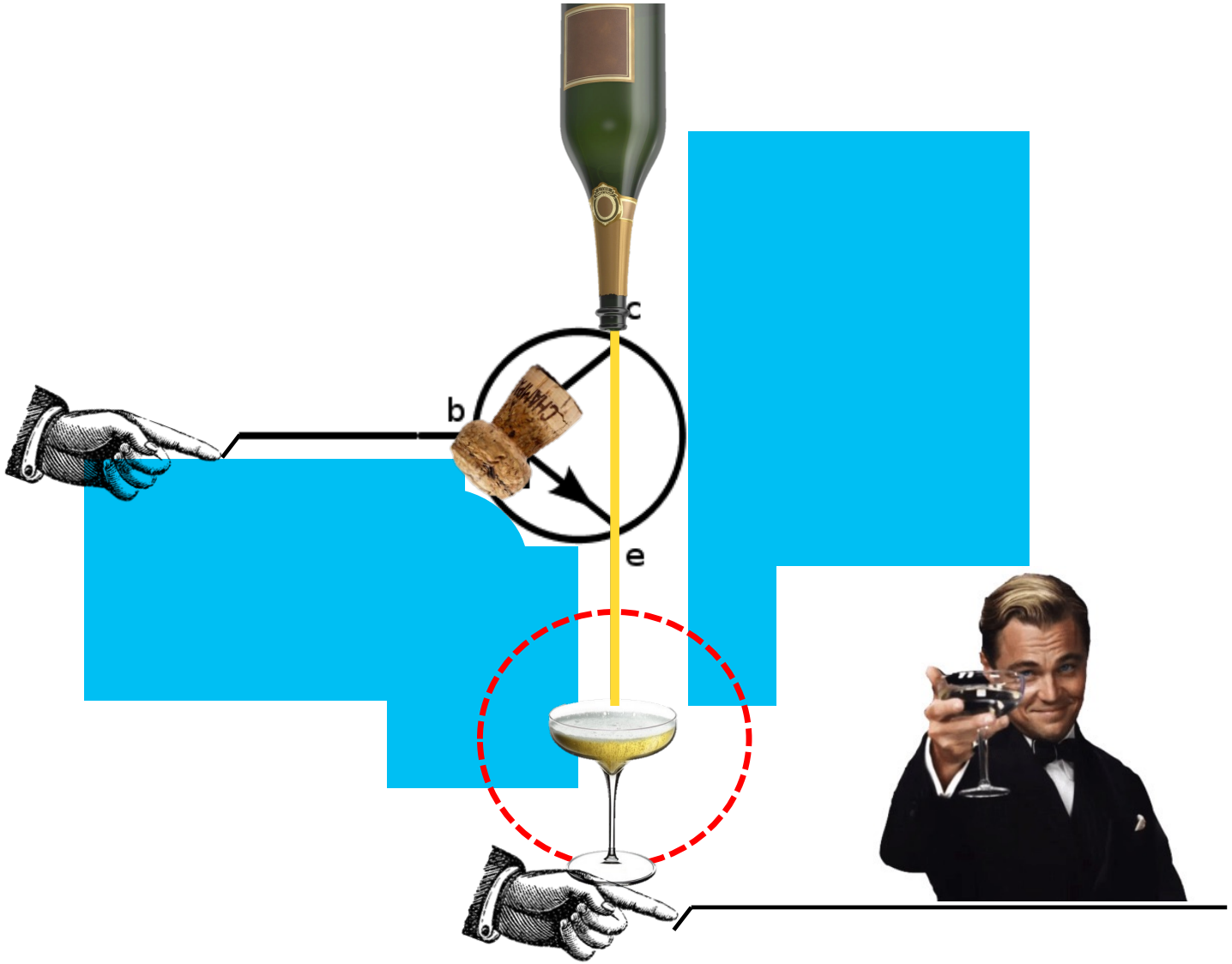

I_{ce}
… it allows for
a larger current
to flow here
c
b
I_{be}
If a small current
flows here…
e

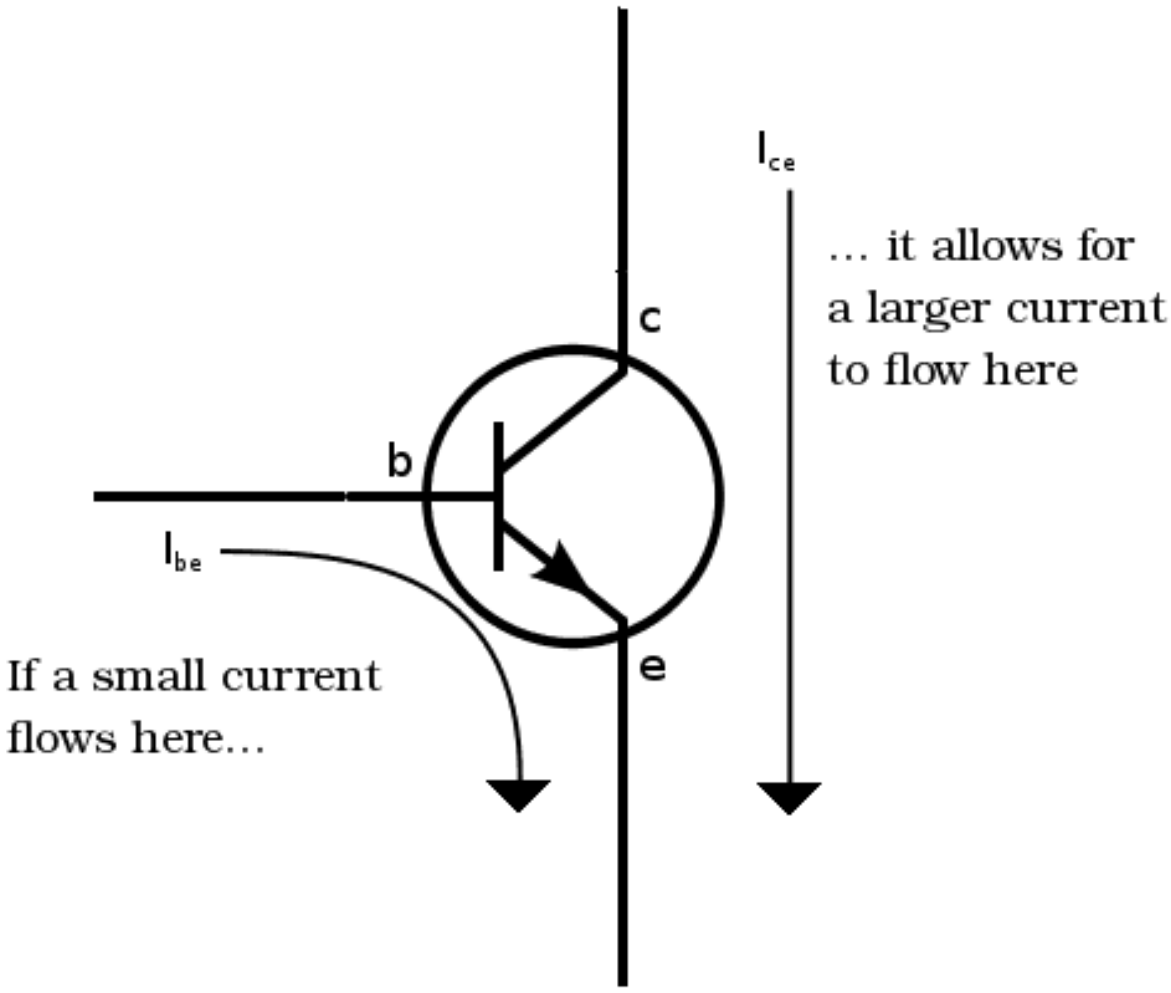

c
b
e

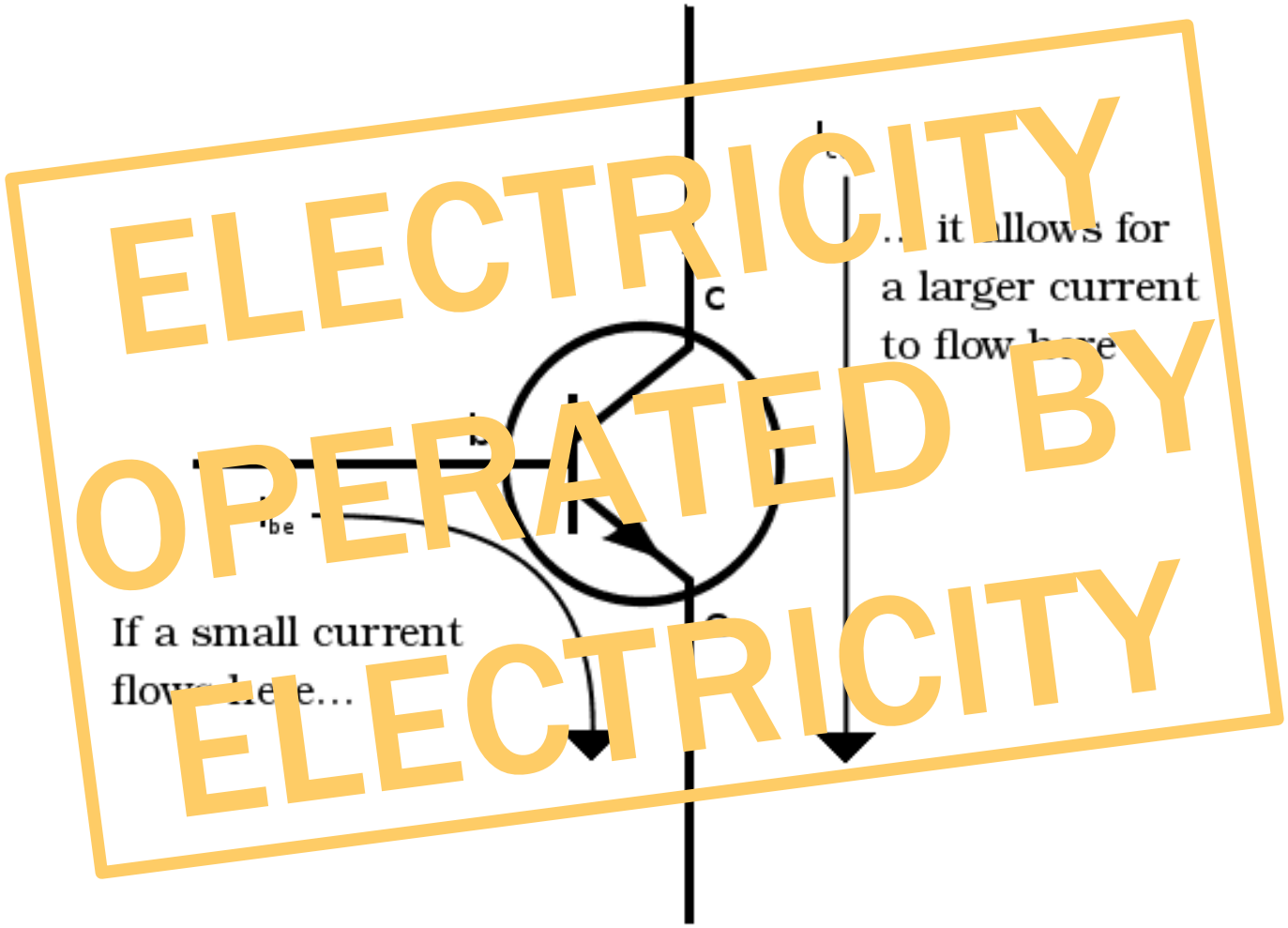

c
b
e


c
b
e


c
b
e


c
b
e


I_{ce}
… it allows for
a larger current
to flow here
c
b
I_{be}
If a small current
flows here…
e




cruzer
micro
4 GB
09:45
AM WED 6/12
6410
10:00
10:00
10/08/2020


cruzer
micro
4 GB
6410
NO
MOVING
PARTS

HELLO ELECTRONICS GOODBYE MECHANICS*

*Not really: I still need to grind my coffee beans. Also, flying.

COMPUTERS DO NOT NEED
TO BE ELECTRONIC, BUT THEY ARE
BECAUSE EVERYBODY LOVES TRANSISTORS

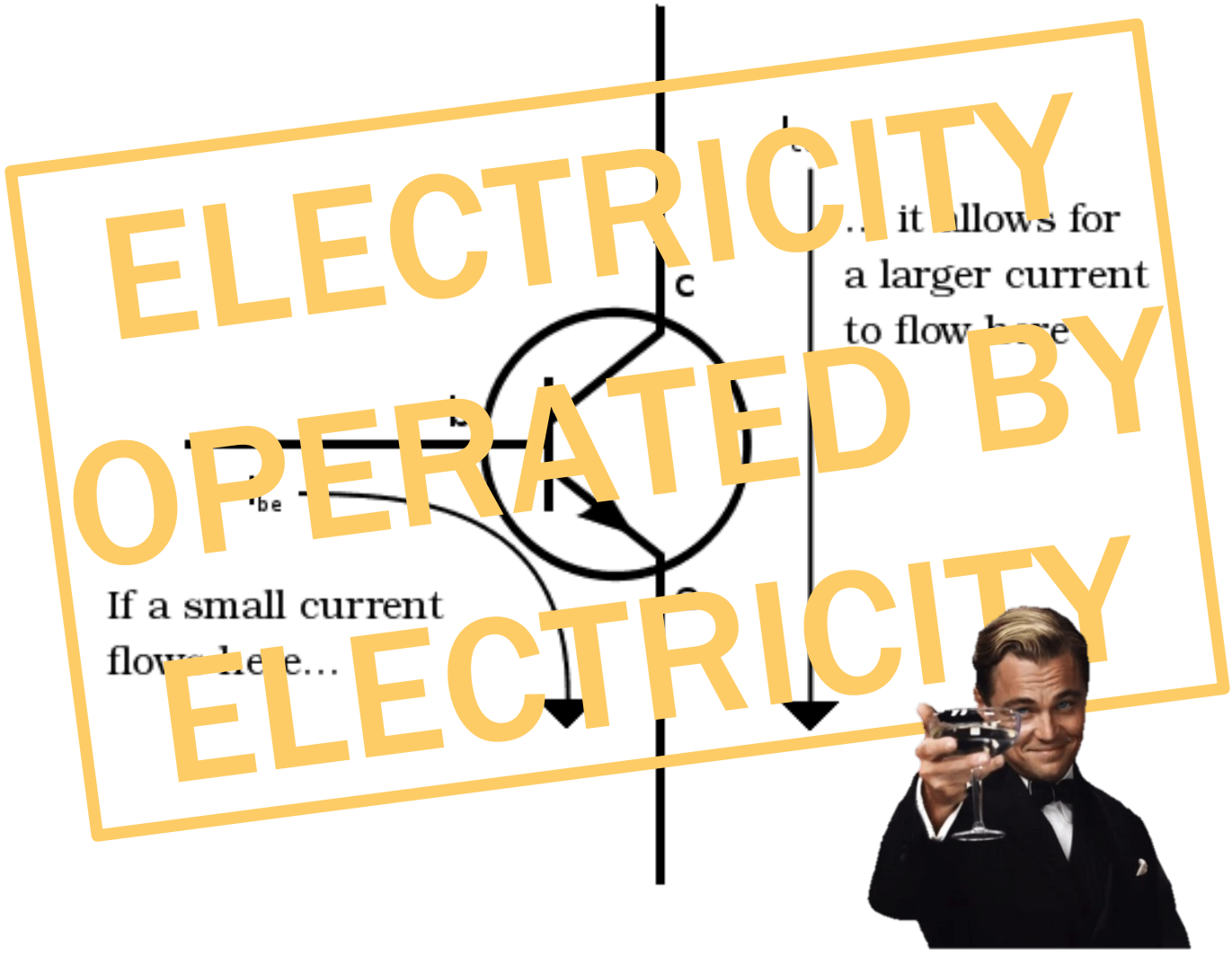

BOO
MECHANICS
BOOOO!


M·G·M PRESENTS
FORBIDDEN PLANET
AMAZING!
STARRING WALTER PIDGEON · ANNE FRANCIS · LESLIE NIELSEN
BASED ON A STORY BY IRVING BLOCK AND ALLEN ADLER
WITH WARREN STEVENS AND INTRODUCING ROBBY, THE ROBOT
SCREEN PLAY BY CYRIL HUME
PHOTOGRAPHED IN EASTMAN COLOR
DIRECTED BY FRED McLEOD WILCOX · PRODUCED BY NICHOLAS NAYFACK
IN CINEMASCOPE AND COLOR
A METRO-GOLDWYN-MAYER PICTURE


BIG MACHINE.


NO INSTRUMENTALITIES.


Dubbed in Italian:
SENZA MECCANISMI.


C
... it allows for
a larger current
to flow here
If a small current
flows here...
ELECTRICITY
OPERATED BY
ELECTRICITY


Dubbed in Italian:
SENZA MECCANISMI.


NO INSTRUMENTALITIES.


NO INSTRUMENTALITIES.

“FORBIDDEN PLANET”

FIRST MOVIE EVER to depict humans traveling in a faster-than-light starship of their own creation.

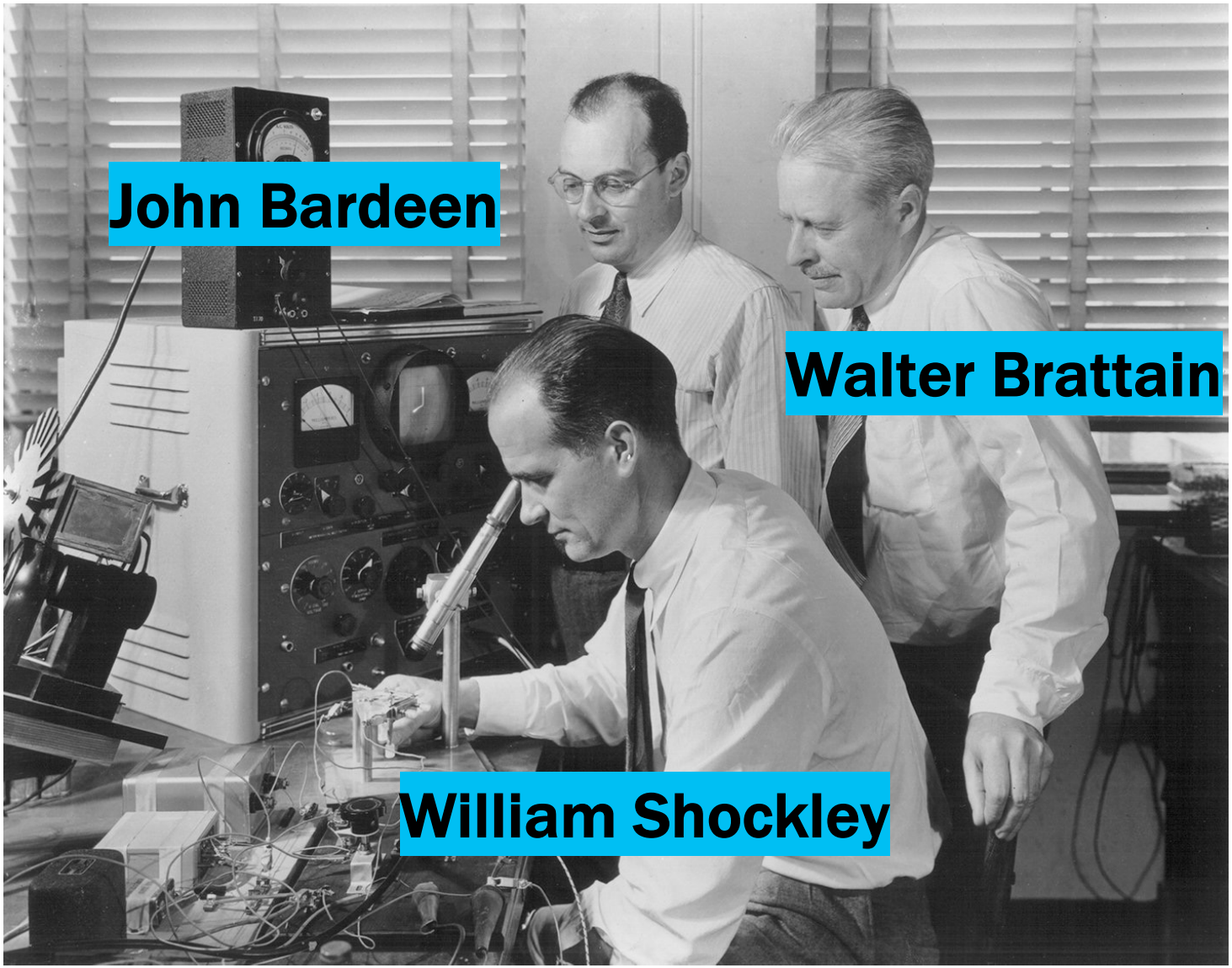
FIRST MOVIE EVER to be set entirely on another planet in interstellar space, far away from Earth.

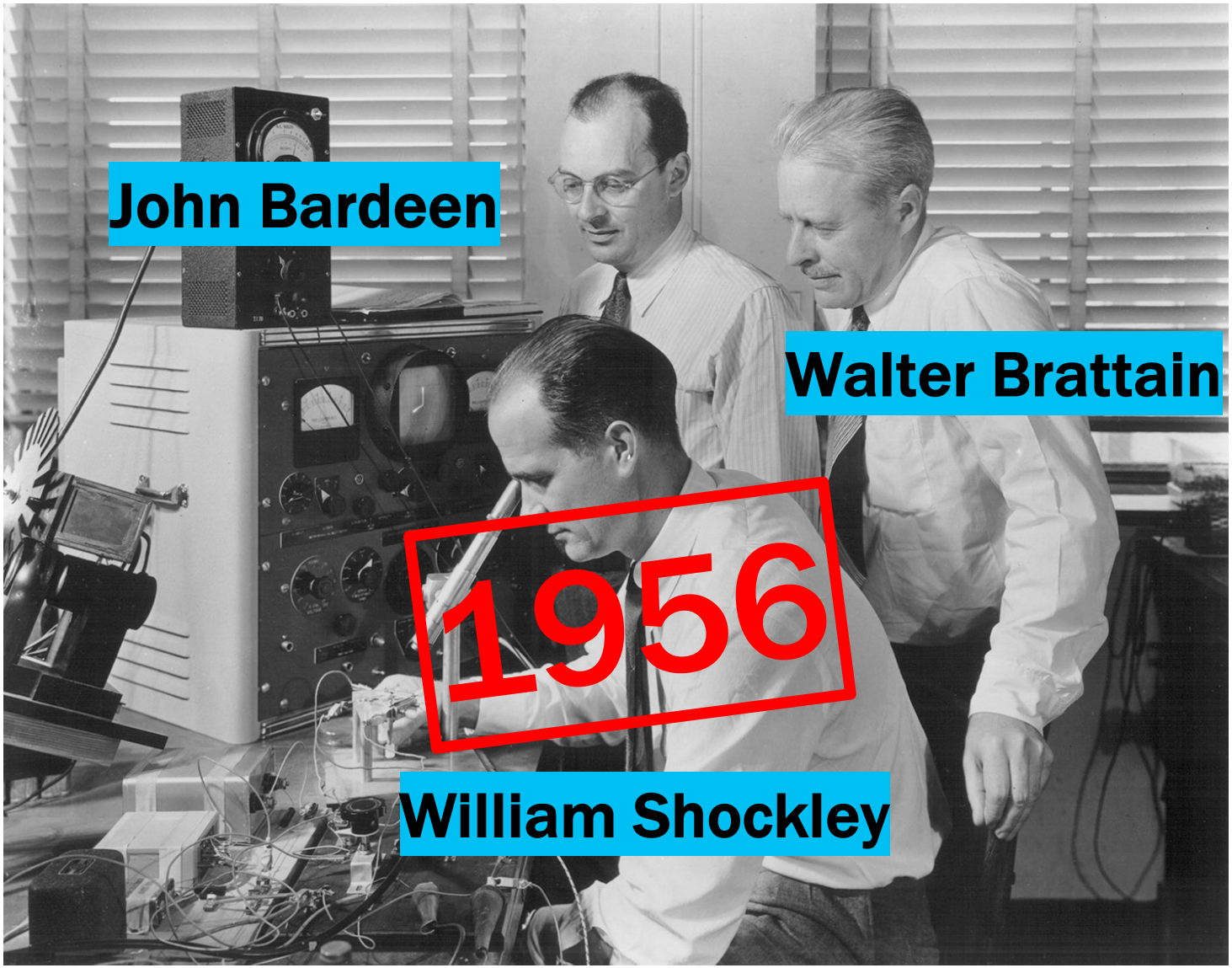
FIRST MOVIE EVER to feature a robot character with a distinct personality and an integral supporting character in the film.

FIRST MOVIE EVER to use an entirely ELECTRONIC musical score.

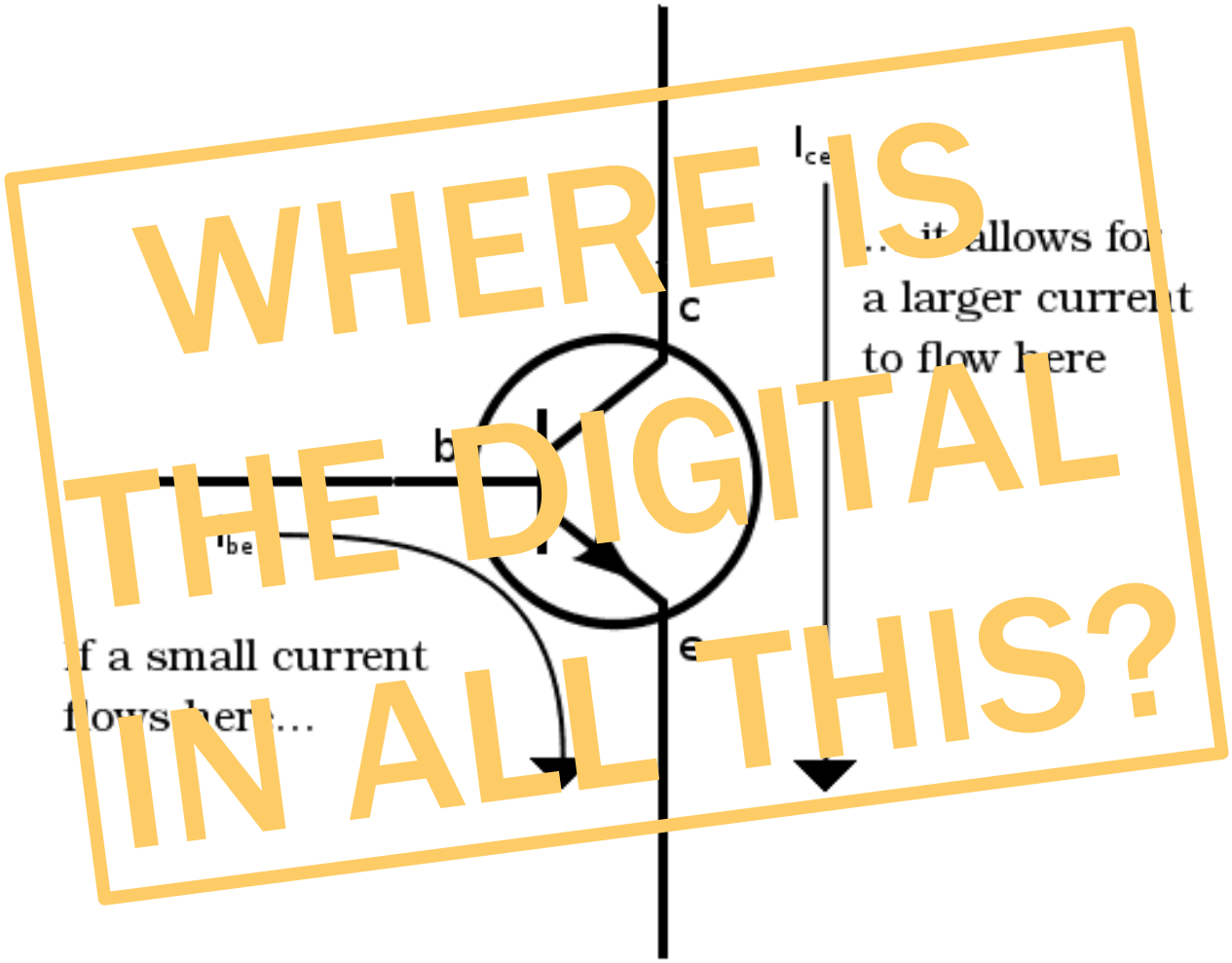

M·G·M PRESENTS
FORBIDDEN PLANET
AMAZING!
STARRING WALTER PIDGEON · ANNE FRANCIS · LESLIE NIELSEN
BASED ON A STORY BY IRVING BLOCK AND ALLEN ADLER
WITH WARREN STEVENS AND INTRODUCING ROBBY, THE ROBOT
SCREEN PLAY BY CYRIL HUME
PHOTOGRAPHED IN EASTMAN COLOR
DIRECTED BY FRED McLEOD WILCOX · PRODUCED BY NICHOLAS NAYFACK
IN CINEMASCOPE AND COLOR
A METRO-GOLDWYN-MAYER PICTURE


M·G·M PRESENTS
FORBIDDEN PLANET
AMAZING!
1956
STARRING WALTER PIDGEON · ANNE FRANCIS · LESLIE NIELSEN
BASED ON A STORY BY IRVING BLOCK AND ALLEN ADLER
WITH WARREN STEVENS AND INTRODUCING ROBBY, THE ROBOT
SCREEN PLAY BY CYRIL HUME
PHOTOGRAPHED IN EASTMAN COLOR
DIRECTED BY FRED McLEOD WILCOX · PRODUCED BY NICHOLAS NAYFACK
IN CINEMASCOPE AND COLOR
A METRO-GOLDWYN-MAYER PICTURE


John Bardeen
Walter Brattain
William Shockley


John Bardeen
Walter Brattain
1956
William Shockley

WAIT!

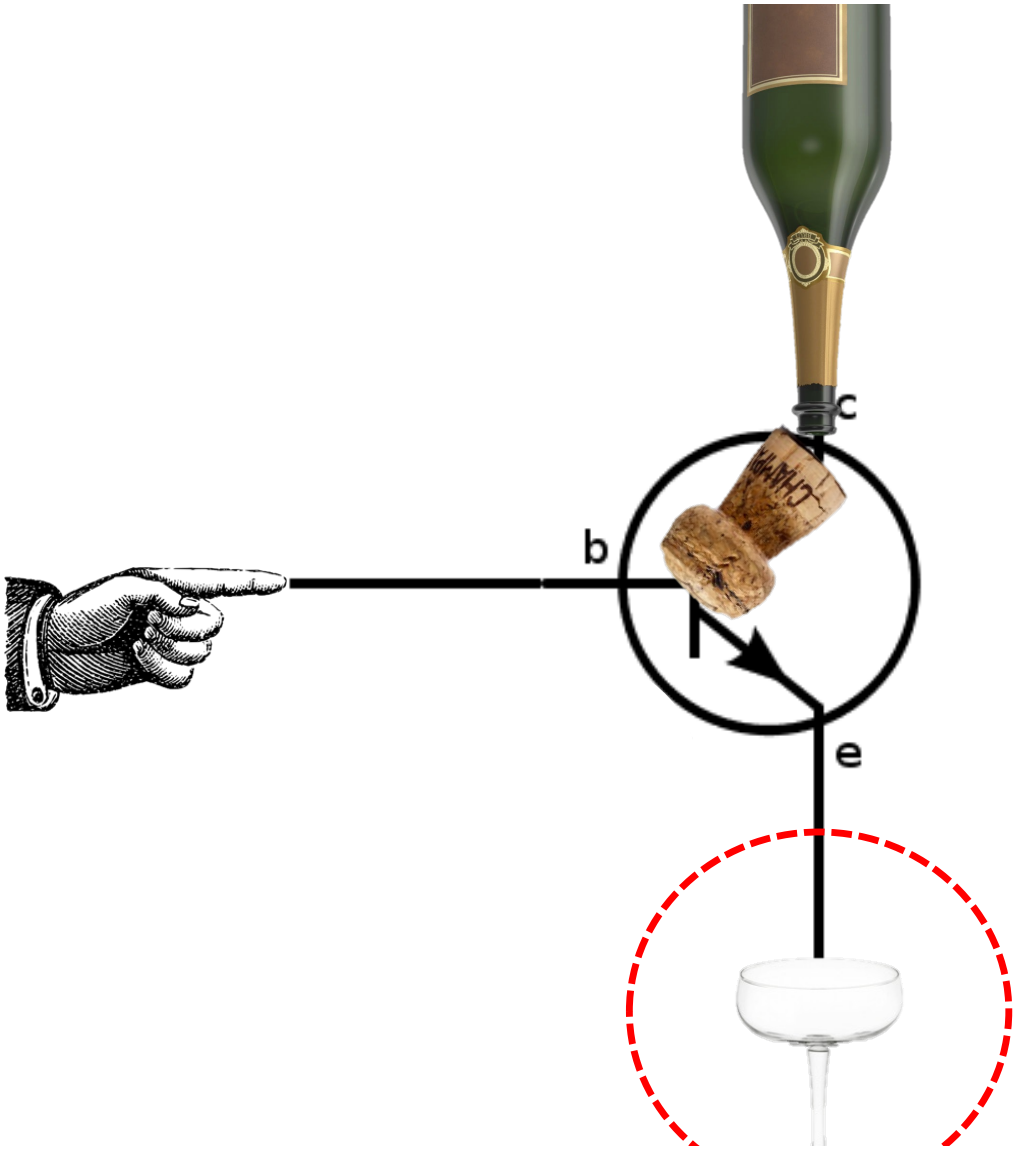

WHERE IS
THE DIGITAL
IN ALL THIS?
I_{ce}
... it allows for
a larger current
to flow here
c
b
I_{be}
e
f a small current
flows her...

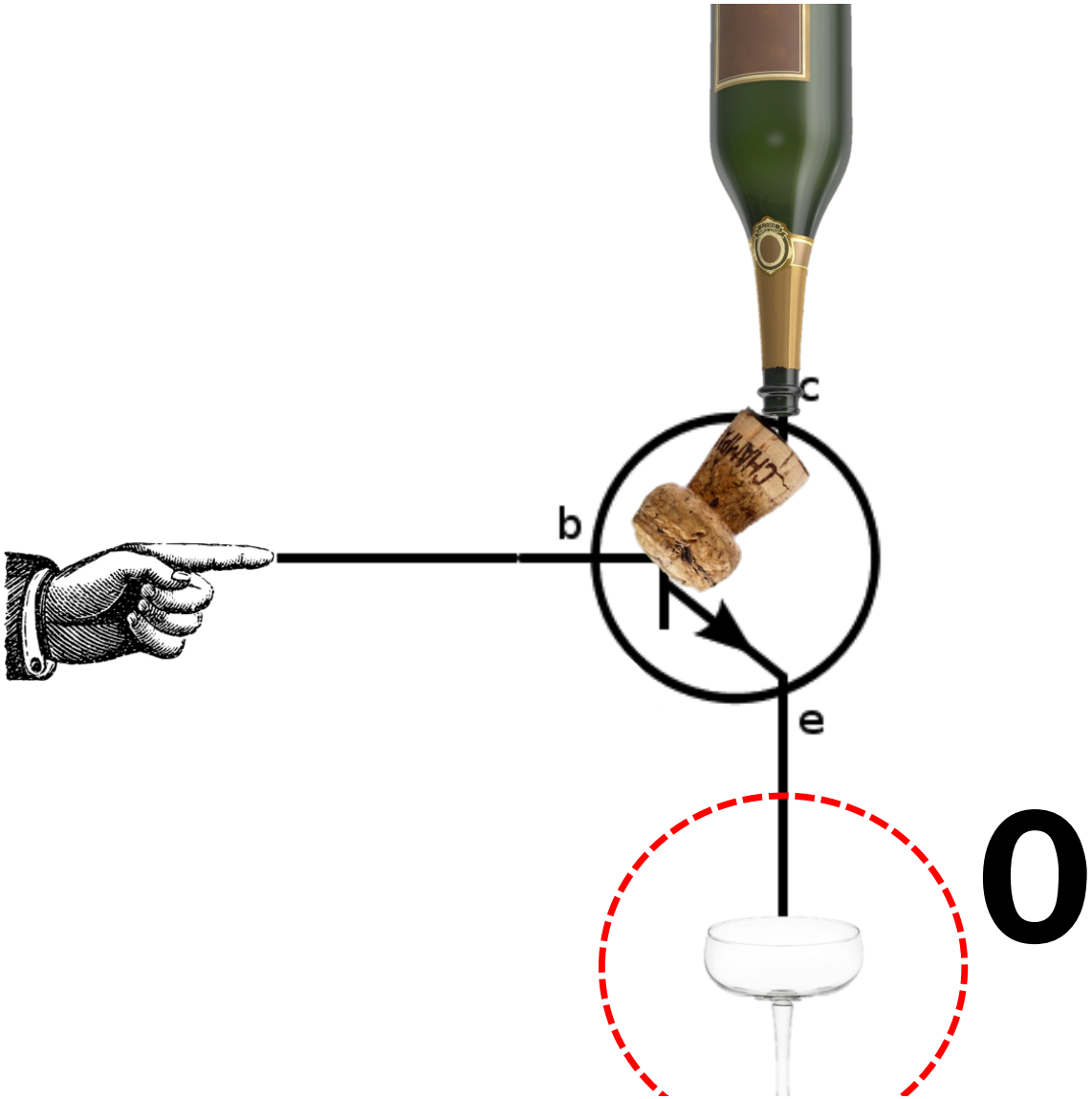
THE MOST FUNDAMENTAL ENCODING OF THEM ALL*

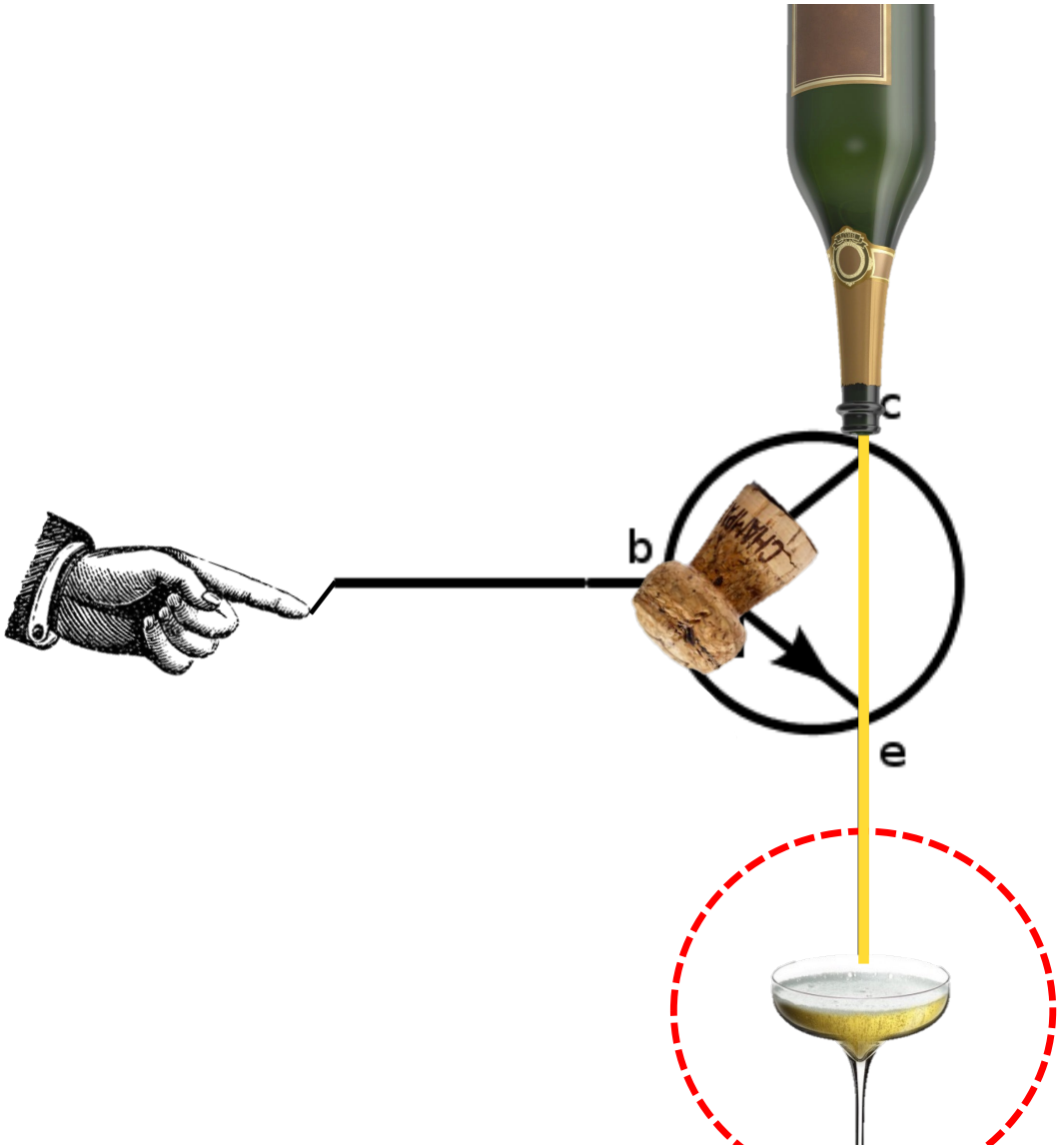
*No side notes here. It really is the most fundamental.

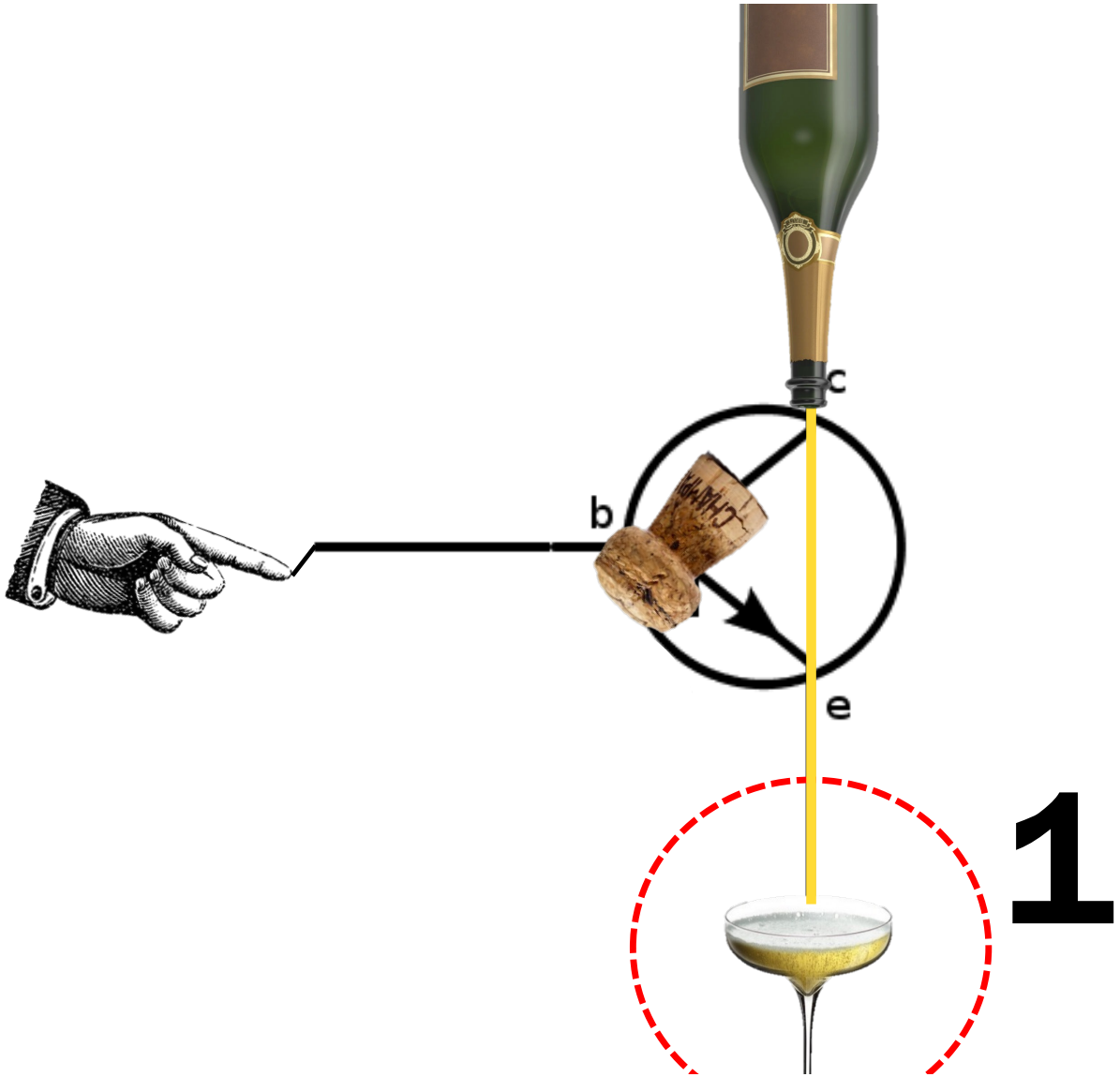
0

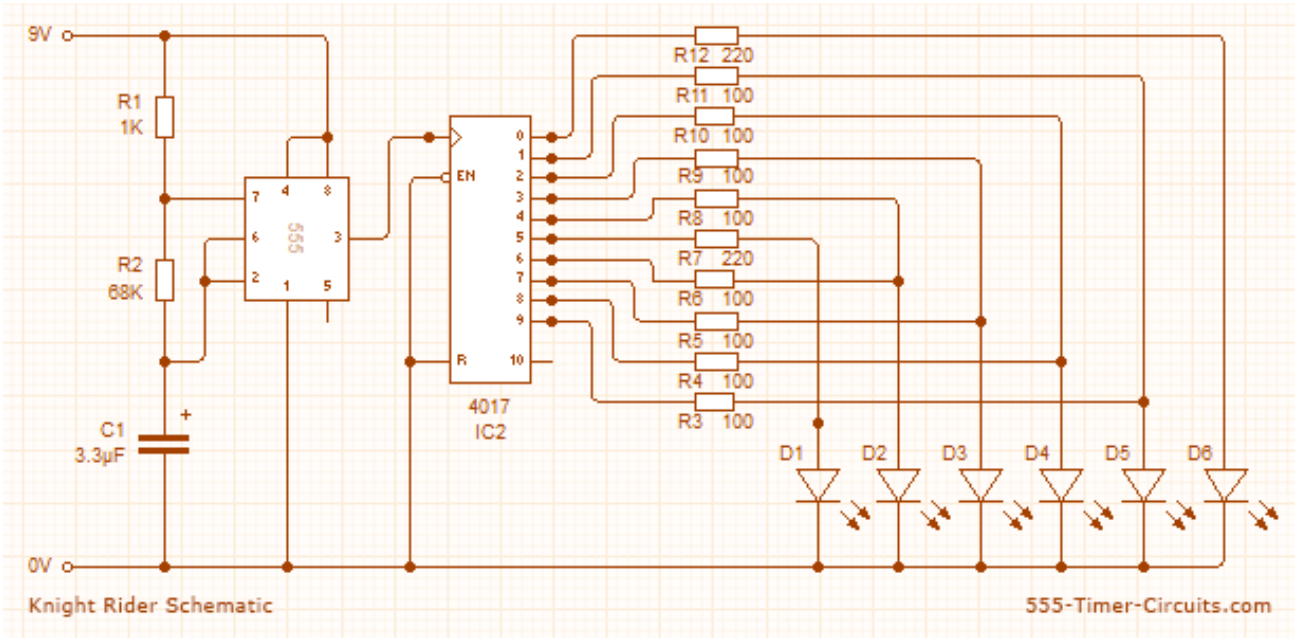
1

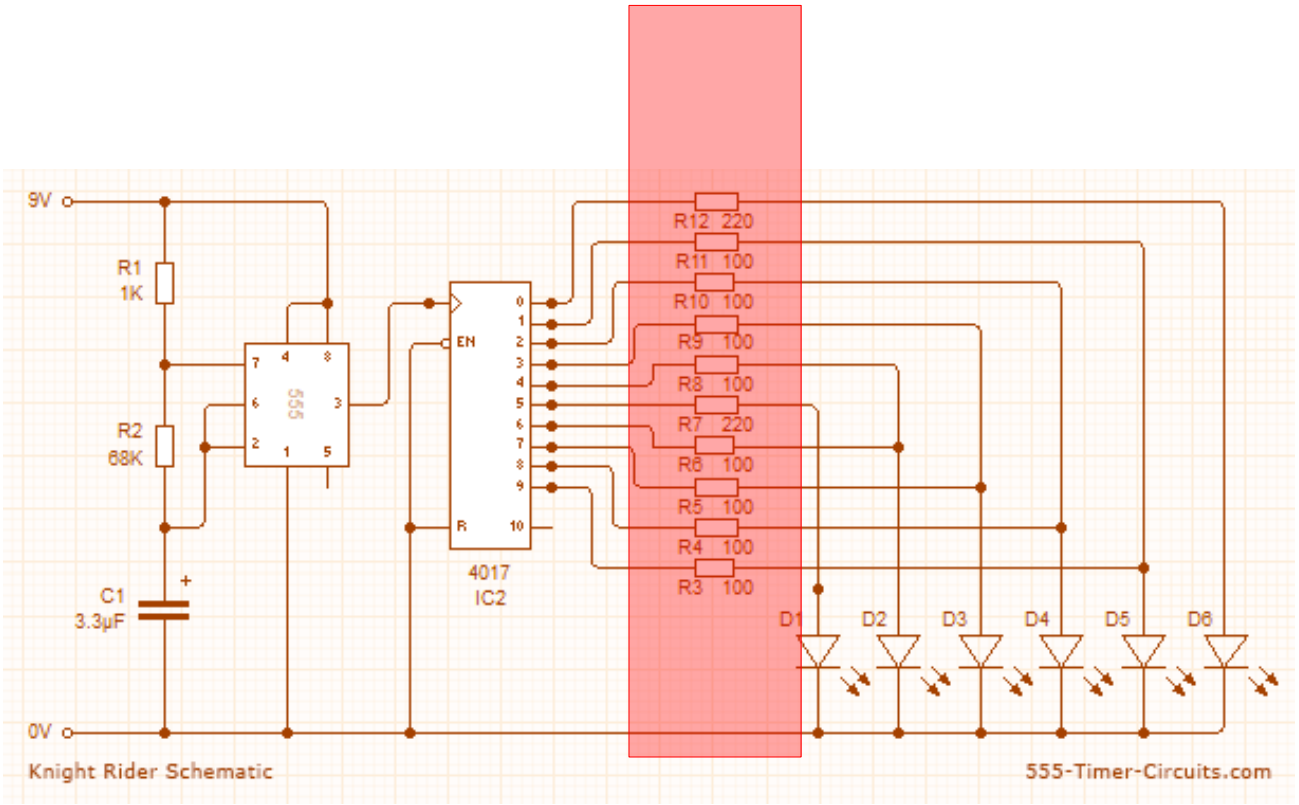

c
b
e

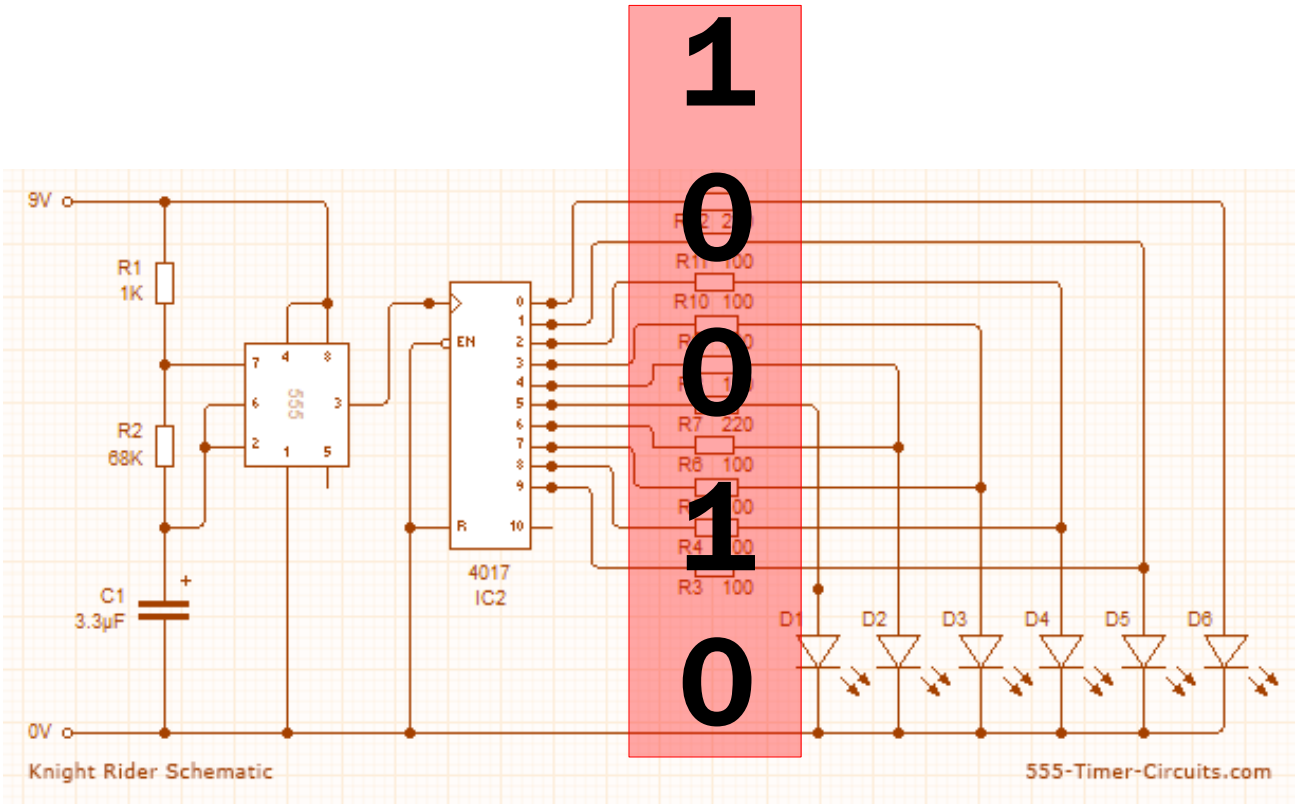

c
b
e
0


c
b
e


c
b
e
1


9V
R1
1K
R2
68K
C1
3.3µF
0V
555
4017
IC2
EN
R
R12 220
R11 100
R10 100
R9 100
R8 100
R7 220
R6 100
R5 100
R4 100
R3 100
D1
D2
D3
D4
D5
D6
Knight Rider Schematic
555-Timer-Circuits.com

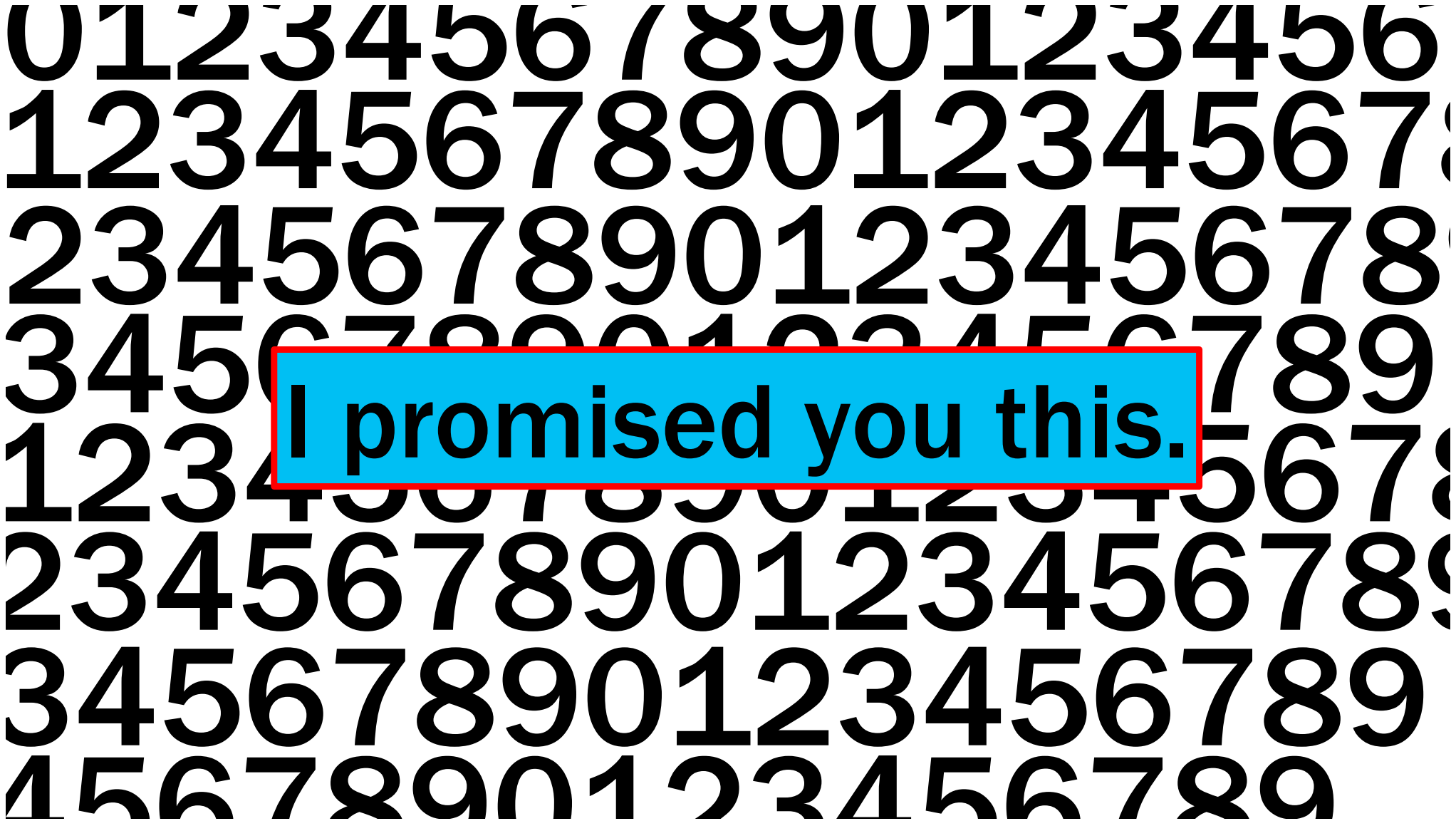

9V
R1
1K
R2
68K
C1
3.3µF
0V
555
EN
R
4017
IC2
R12 220
R11 100
R10 100
R9 100
R8 100
R7 220
R6 100
R5 100
R4 100
R3 100
D1
D2
D3
D4
D5
D6
Knight Rider Schematic
555-Timer-Circuits.com

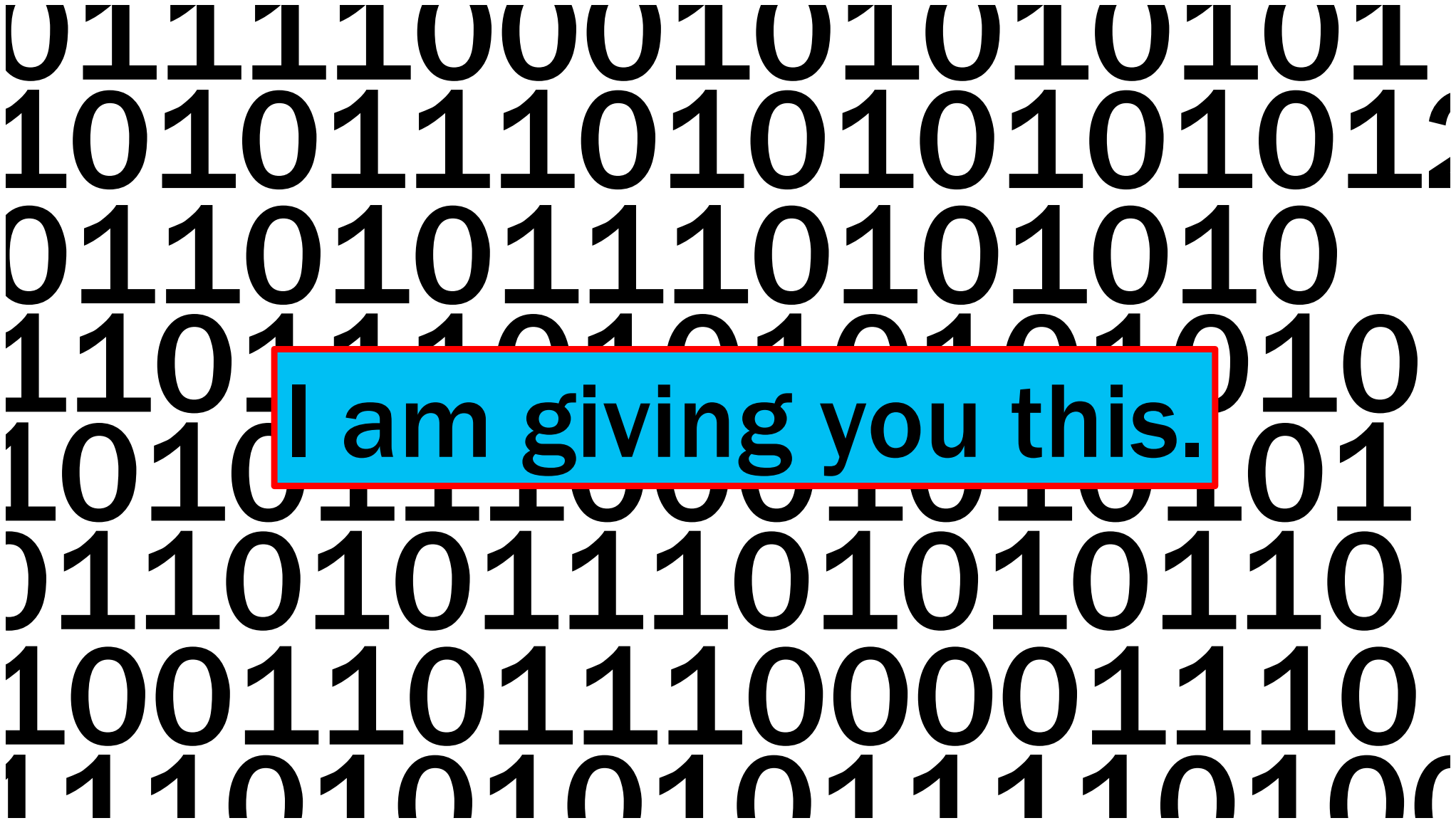

9V
R1
1K
R2
68K
C1
3.3µF
0V
555
EN
R
4017
IC2
R10 100
R7 220
R6 100
R3 100
D1
D2
D3
D4
D5
D6
Knight Rider Schematic
555-Timer-Circuits.com

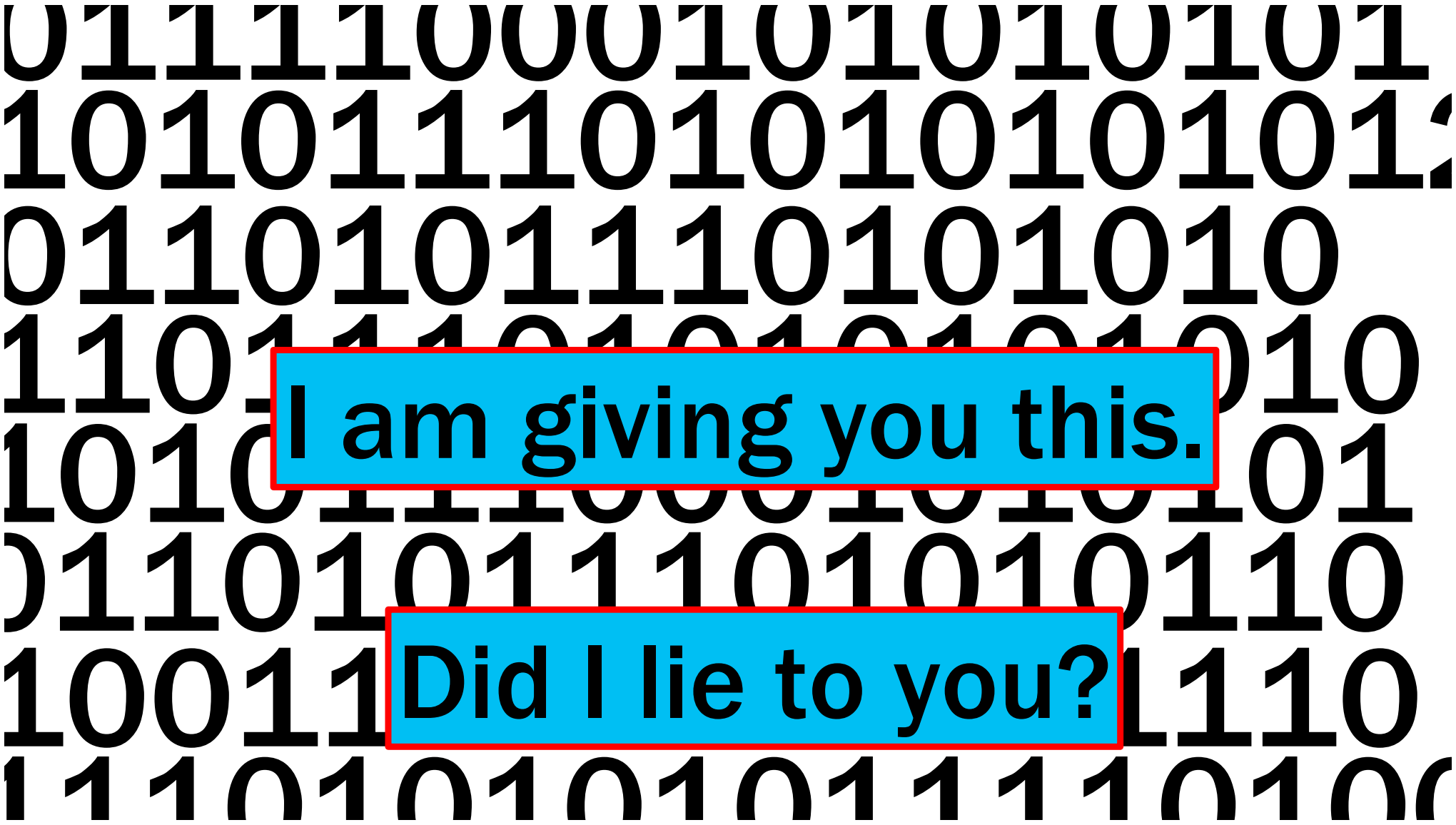
ARE THE DIGITS REALLY THERE?

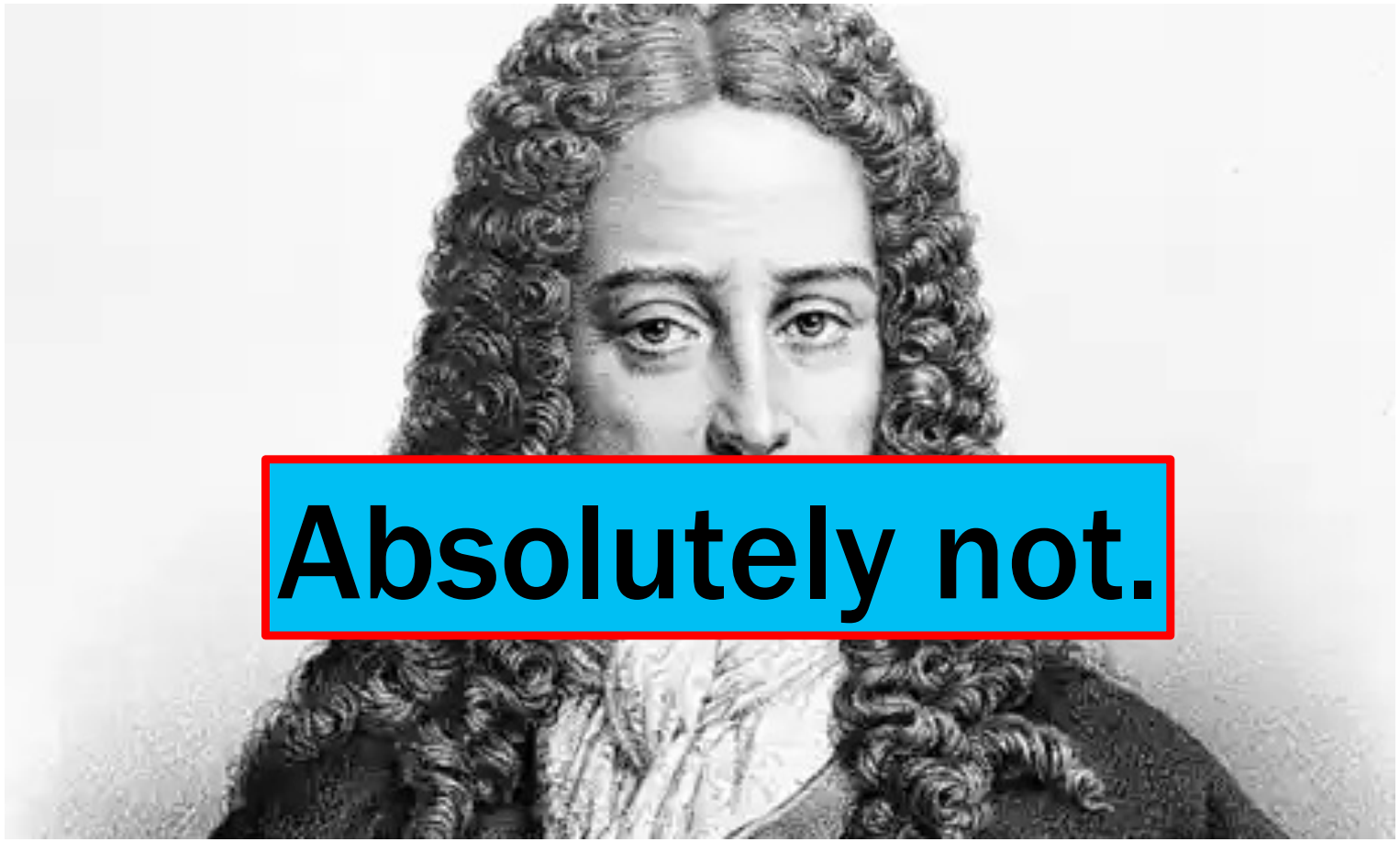
EYE OF THE BEHOLDER.

WAIT!


I promised you this.


I am giving you this.


I am giving you this.
Did I lie to you?


Absolutely not.

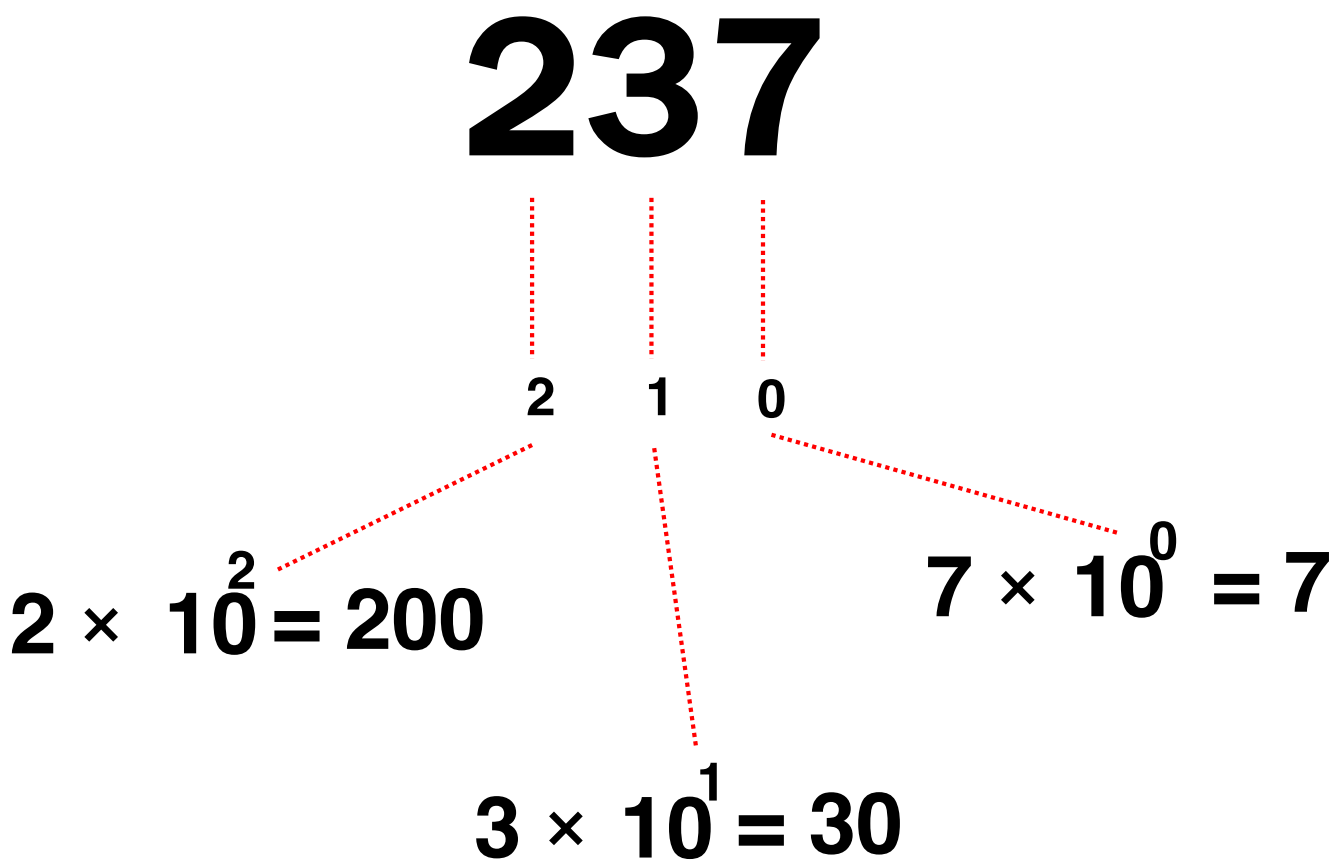
Gottfried Wilhelm Leibniz
(1646-1716)

THE BINARY SYSTEM

{0;1}

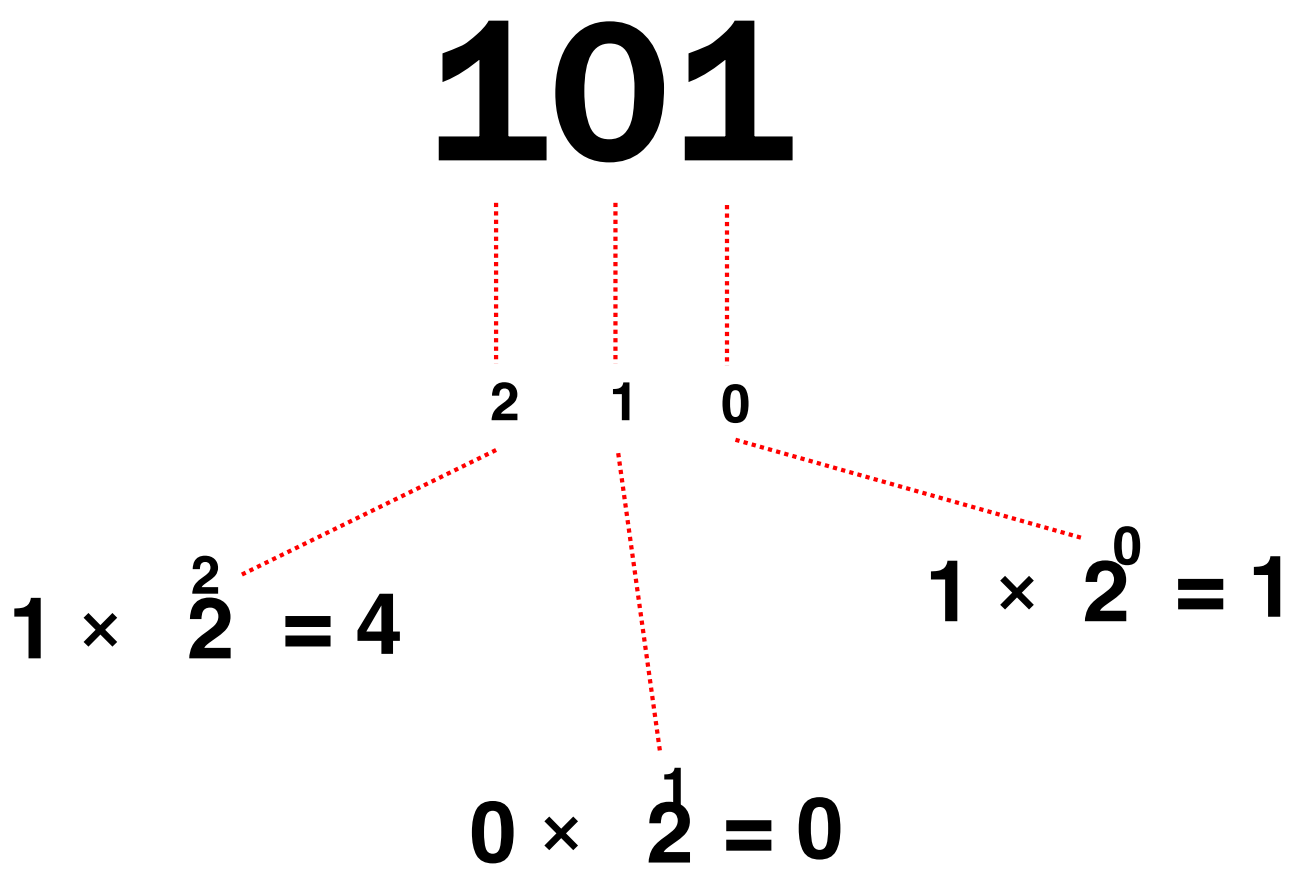
THE DECIMAL SYSTEM {0;1;2;3;4;5;6;7;8;9}

237


237
2 1 0
2 × 10^2 = 200
3 × 10^1 = 30
7 × 10^0 = 7

THE BINARY SYSTEM

{0;1}

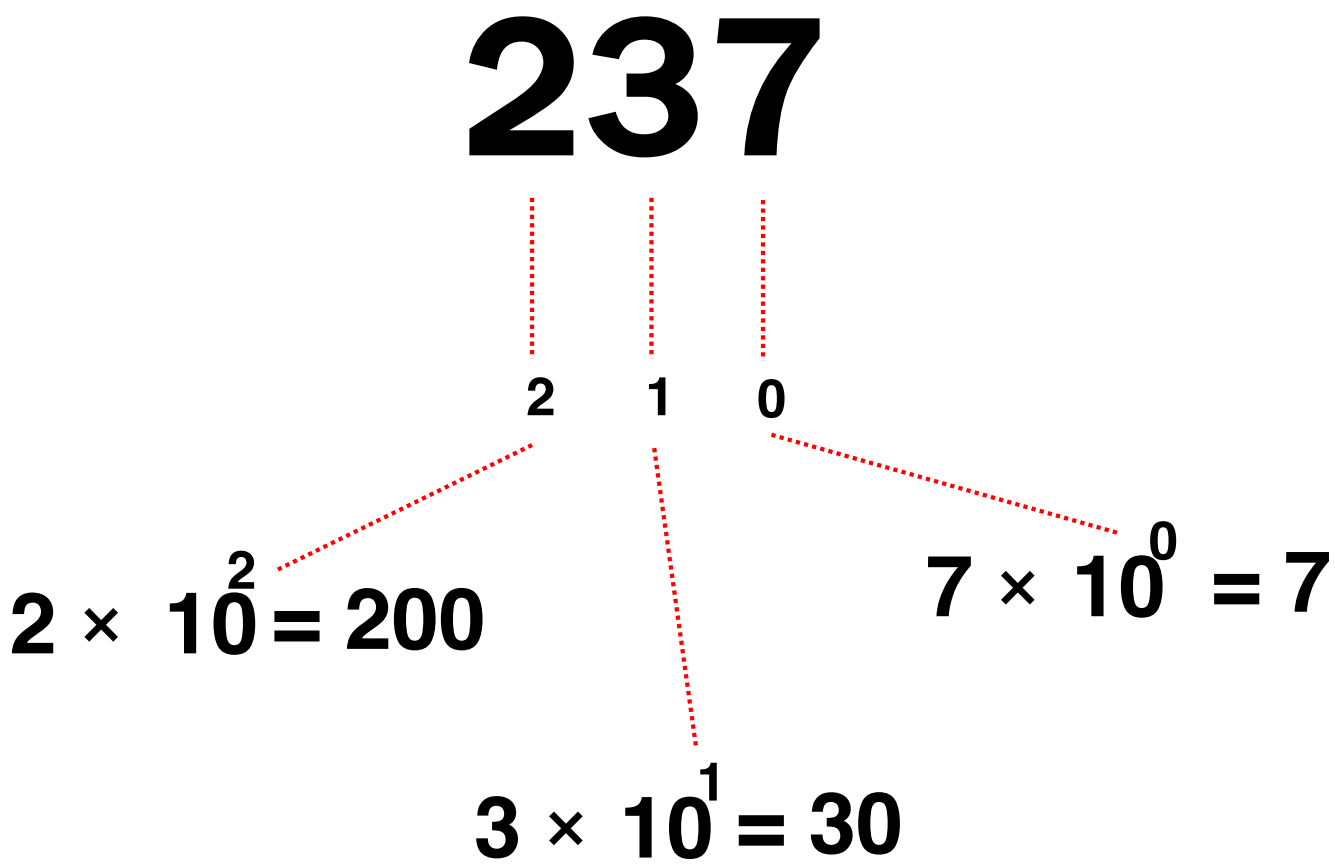

101
2 1 0
1 × 2 = 4
2
0 × 2 = 0
1
1 × 2 = 1
0

101
in binary
encodes
the number 5

$$101_2$$

$$=$$

$$5_{10}$$


237
2 1 0
2 × 10^2 = 200
3 × 10^1 = 30
7 × 10^0 = 7

What is the binary encoding of 237?

$$237 =$$

$$128 + 64 + 32$$

$$+ 8 + 4 + 1$$

(look for powers of 2)

$$237 =$$

$$2^7 + 2^6 + 2^5$$

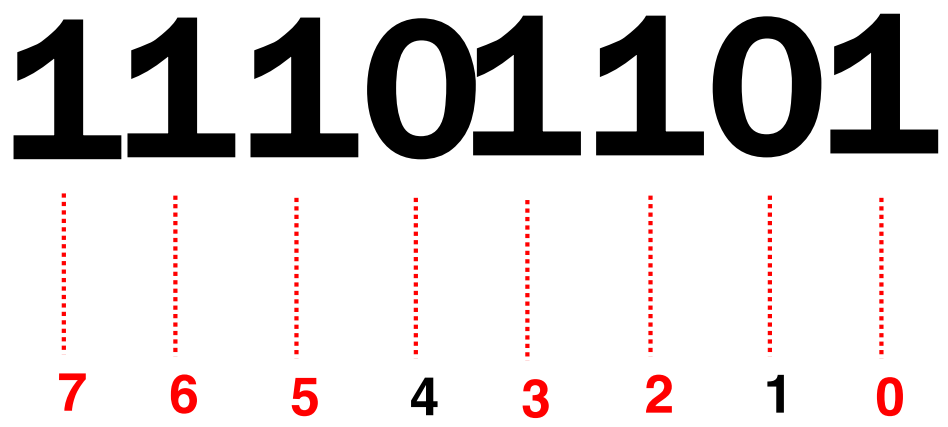
$$+ 2^3 + 2^2 + 2^0$$

$$237 =$$

$$2^7 + 2^6 + 2^5$$

$$+ 2^3 + 2^2 + 2^0$$

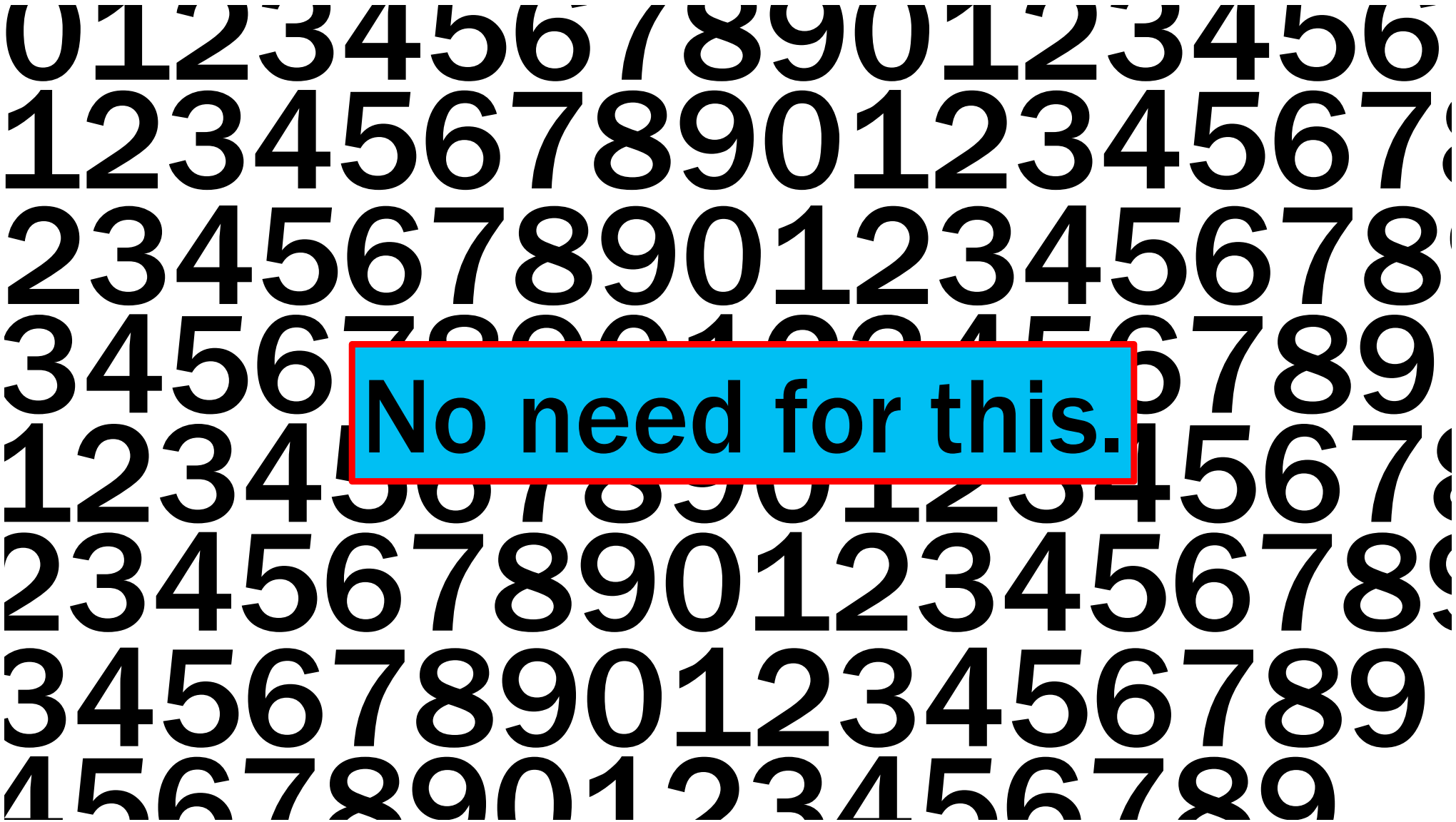
(put a 1 in the positions
indicated by the exponents,
0 in theother positions)

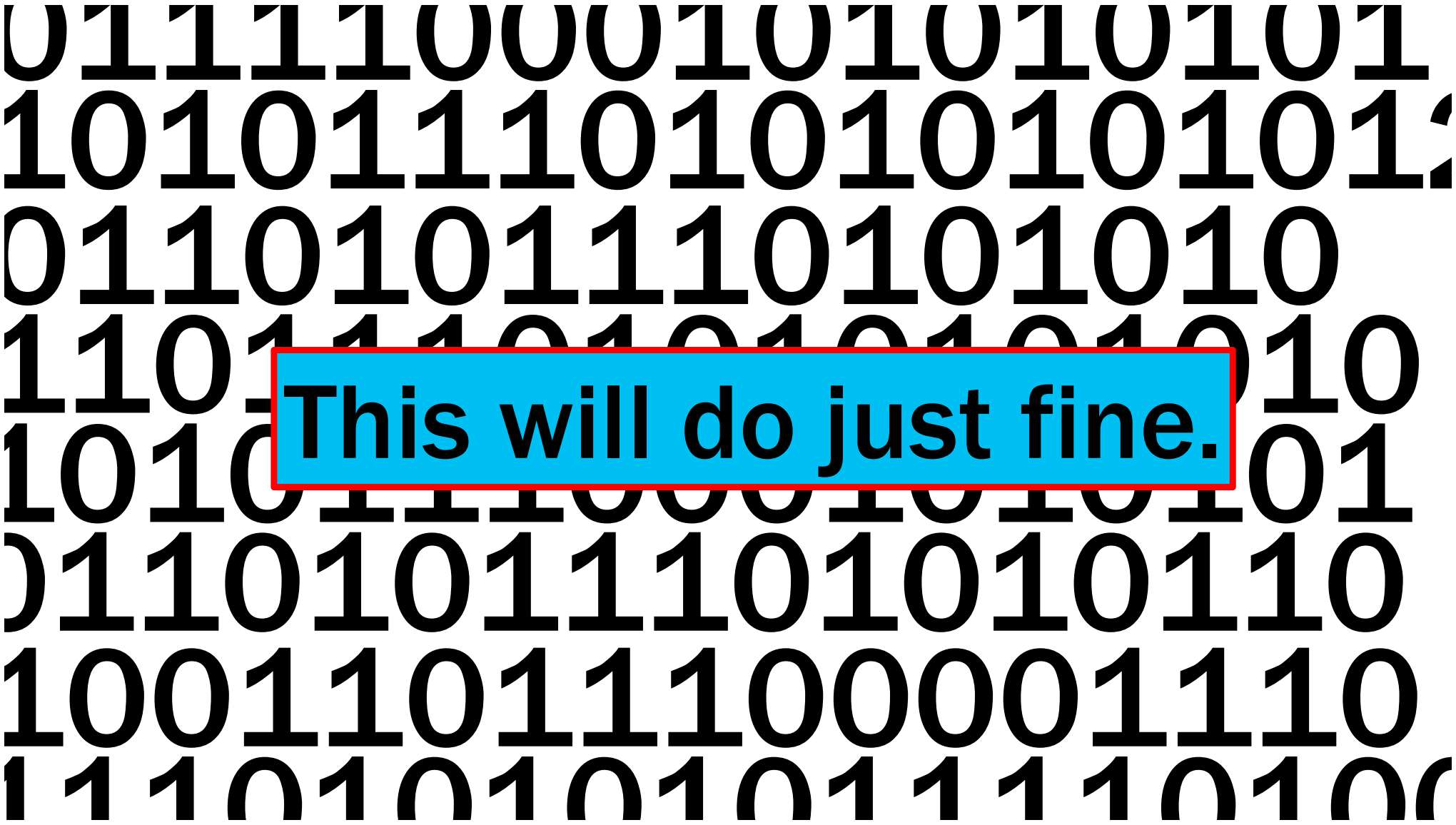

11101101
7 6 5 4 3 2 1 0

$$11101101_2$$

$$=$$

$$237_{10}$$


No need for this.


This will do just fine.

BIBLIOGRAPHY

- Verdicchio M., *L'informatica per la comunicazione*, Franco Angeli, Milano, 2015 (seconda edizione)
- Verdicchio M., The digital in digital art, *Studi di estetica*, anno XLVI, IV serie, 3/2018
- Girelli L., *Noi e i numeri*, Il Mulino, Bologna, 2006
- Bottazioni U., Numeri. Raccontare la matematica,
- Valerio C., *Storia umana della Matematica*, Einaudi, Torino, 2016 (ebook ISBN 9788858423721)
- Burdick A., Drucker J., Lunefeld P. Presner T., Shnapp J.,*Umanistica _ Digitale*, Mondadori, Milano, 2015 *(trad.it* Burdick A., Drucker J., Lunefeld P. Presner T., Shnapp J., *Digital_Humanities*, MIT Press, Cambridge, MA), 2012

WEBGRAPHY

- **Chiara Valerio, Dialoghi su tecnologia, matematica e politica (2020?), https://www.youtube.com/watch?v=L-UUXhjvInQ; 18 febbraio 2022**