Digital Humanities

Lecture 2

February 24

2025

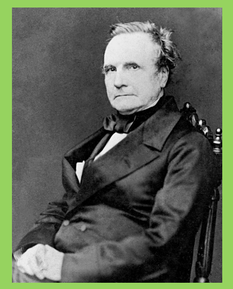
Mario Verdicchio

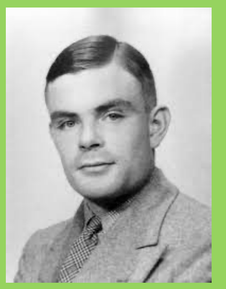
CHAP. 1 - 4

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

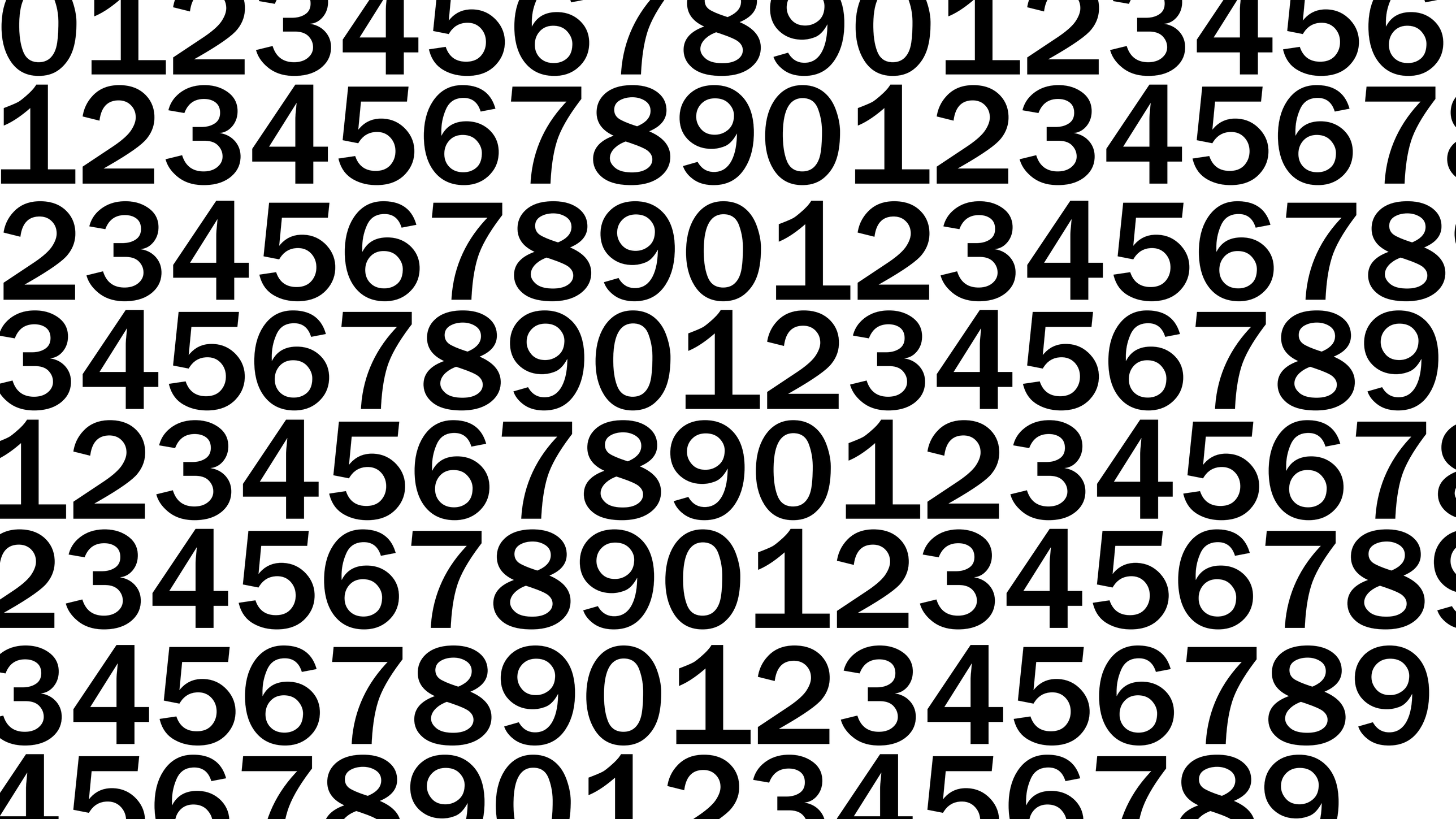
1 - 4

COMPUTATION





Digital


0123456789012345678
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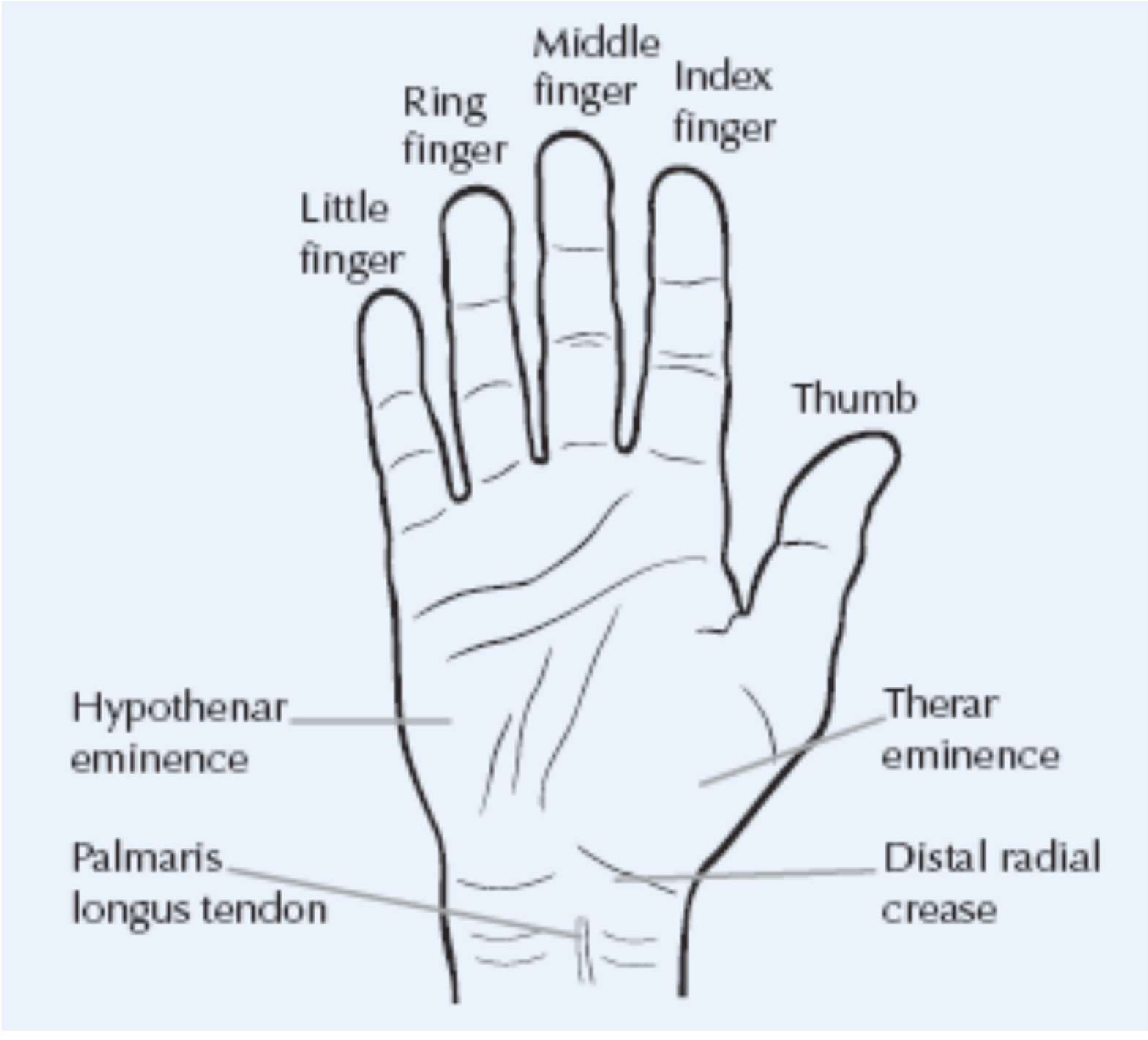

Middle finger
Index finger
Ring finger
Little finger
Thumb
Hypothenar eminence
Therar eminence
Palmaris longus tendon
Distal radial crease

3

4

5

5

٥

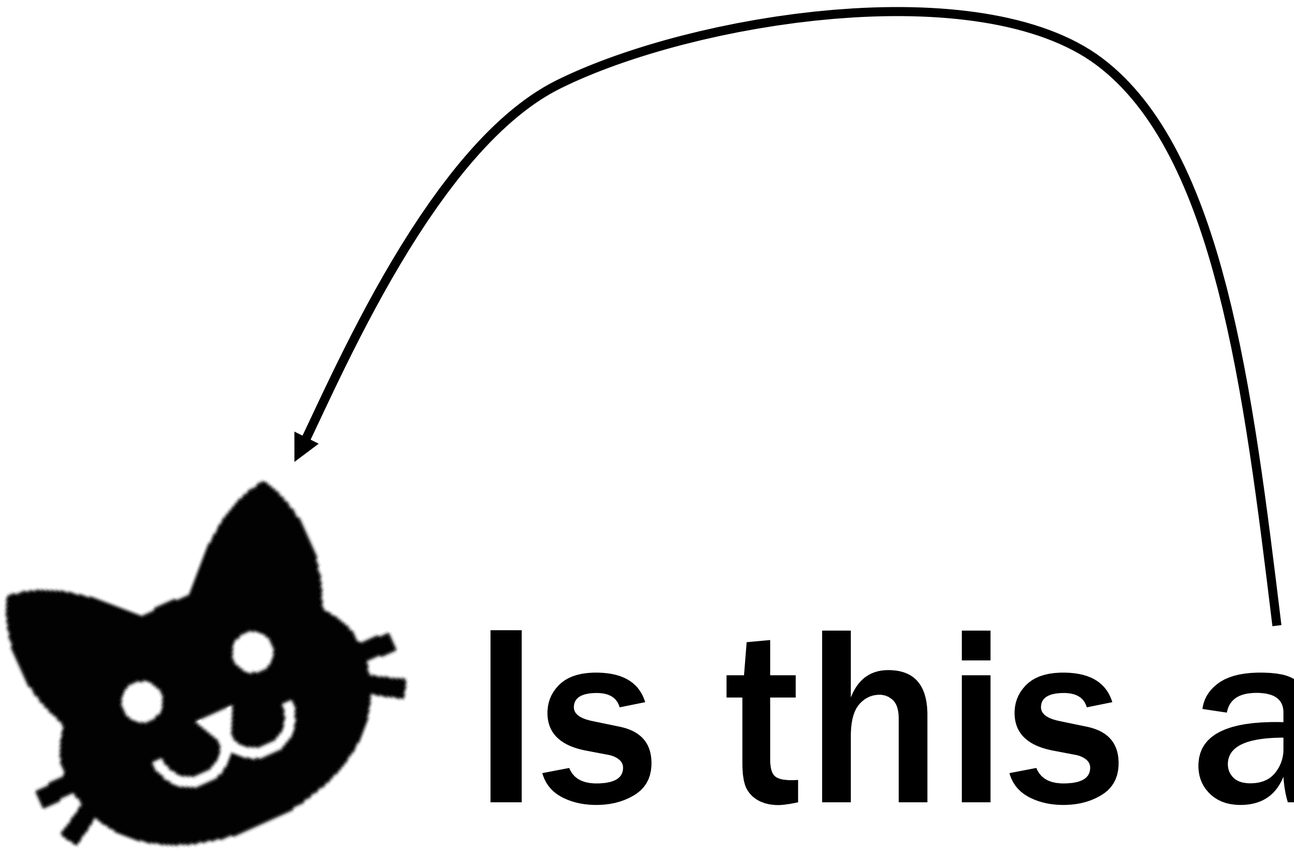
5


5

Digital

Humanities

WAIT!



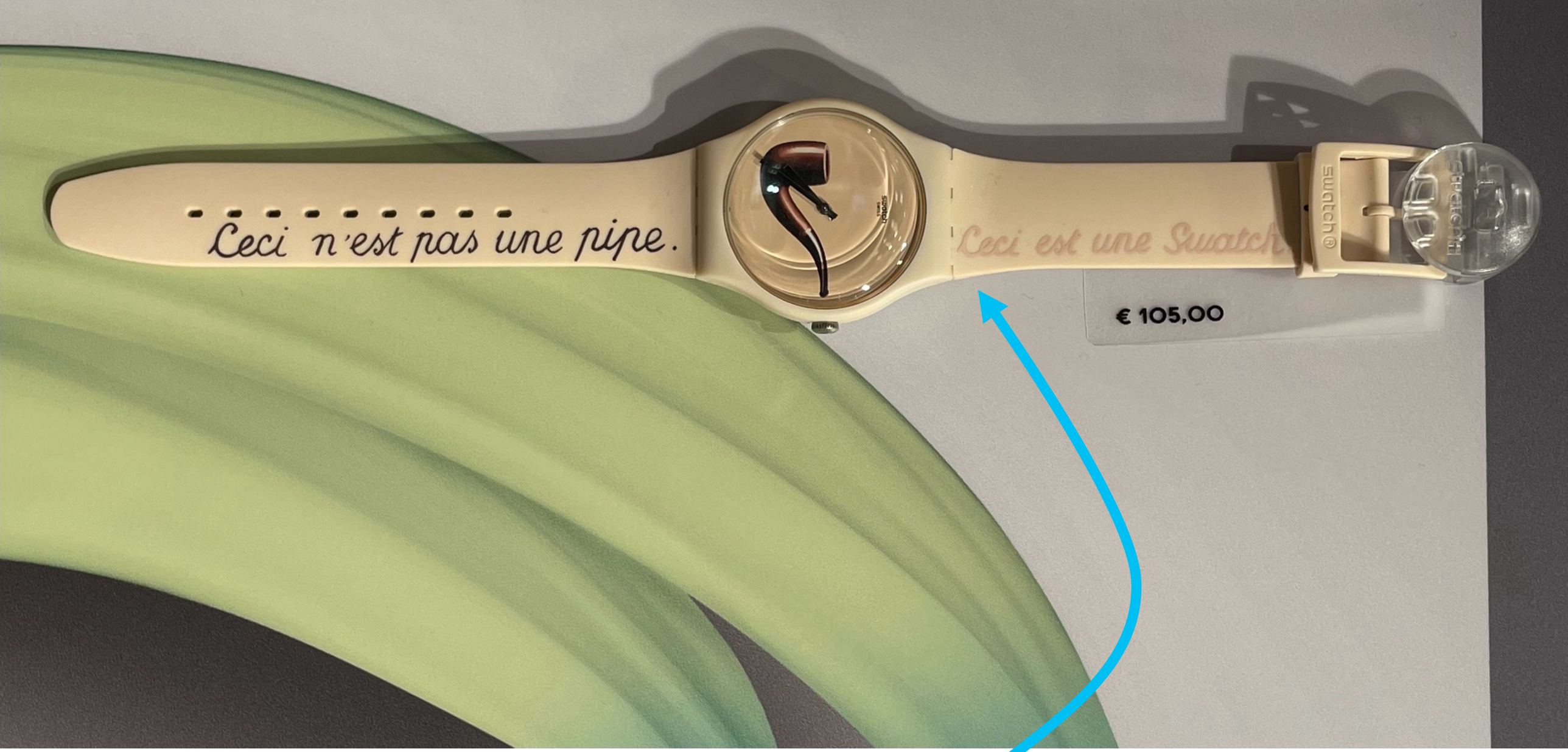
Is this a cat?

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?



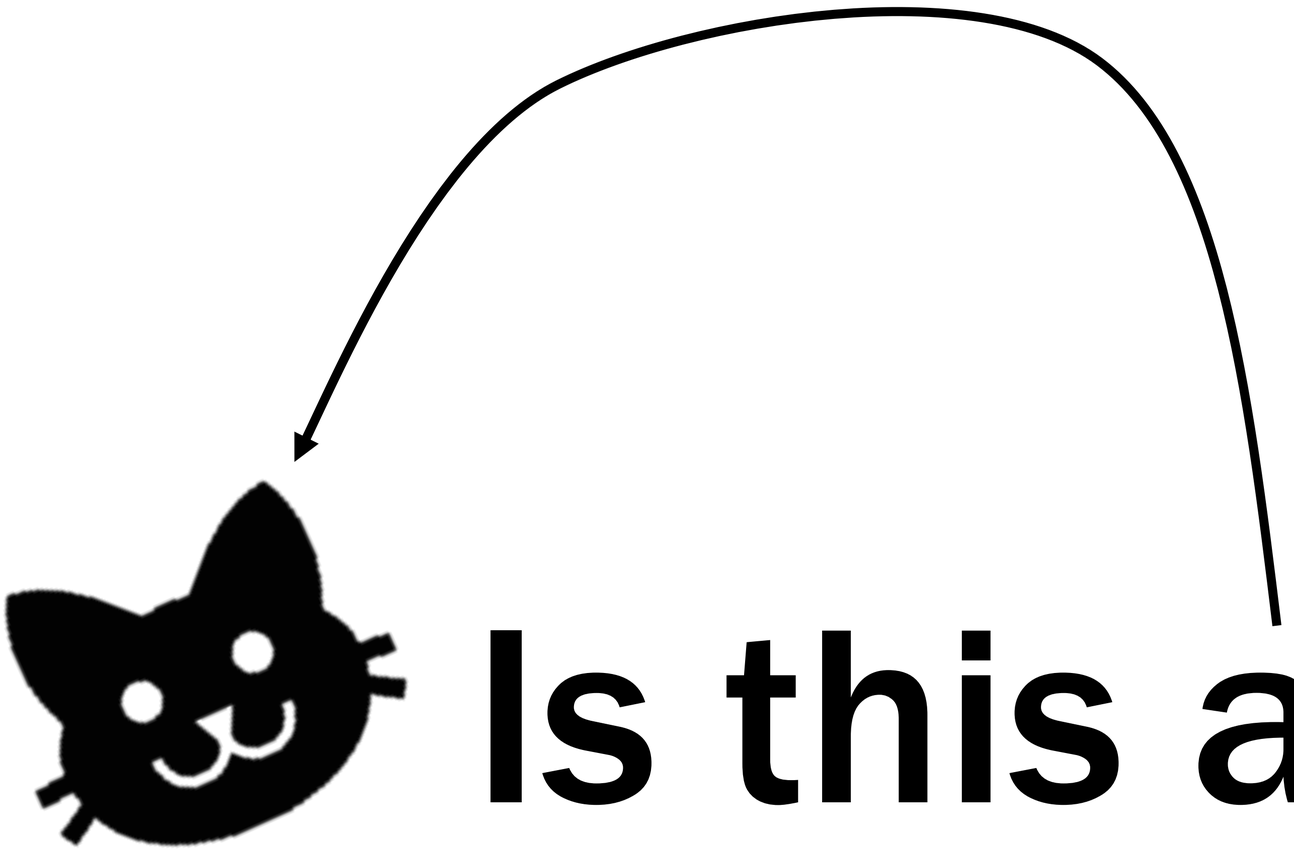
Is this a Swatch?


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?

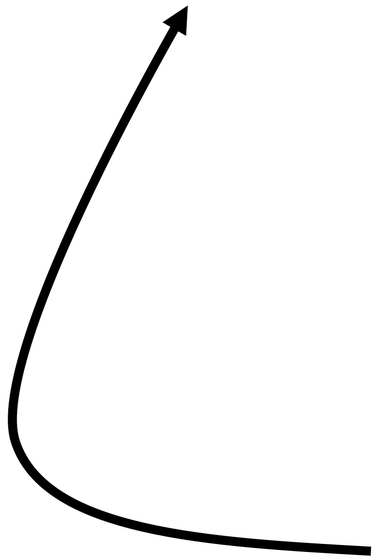
NO!
IT'S AN ICON!

Is this a cat?

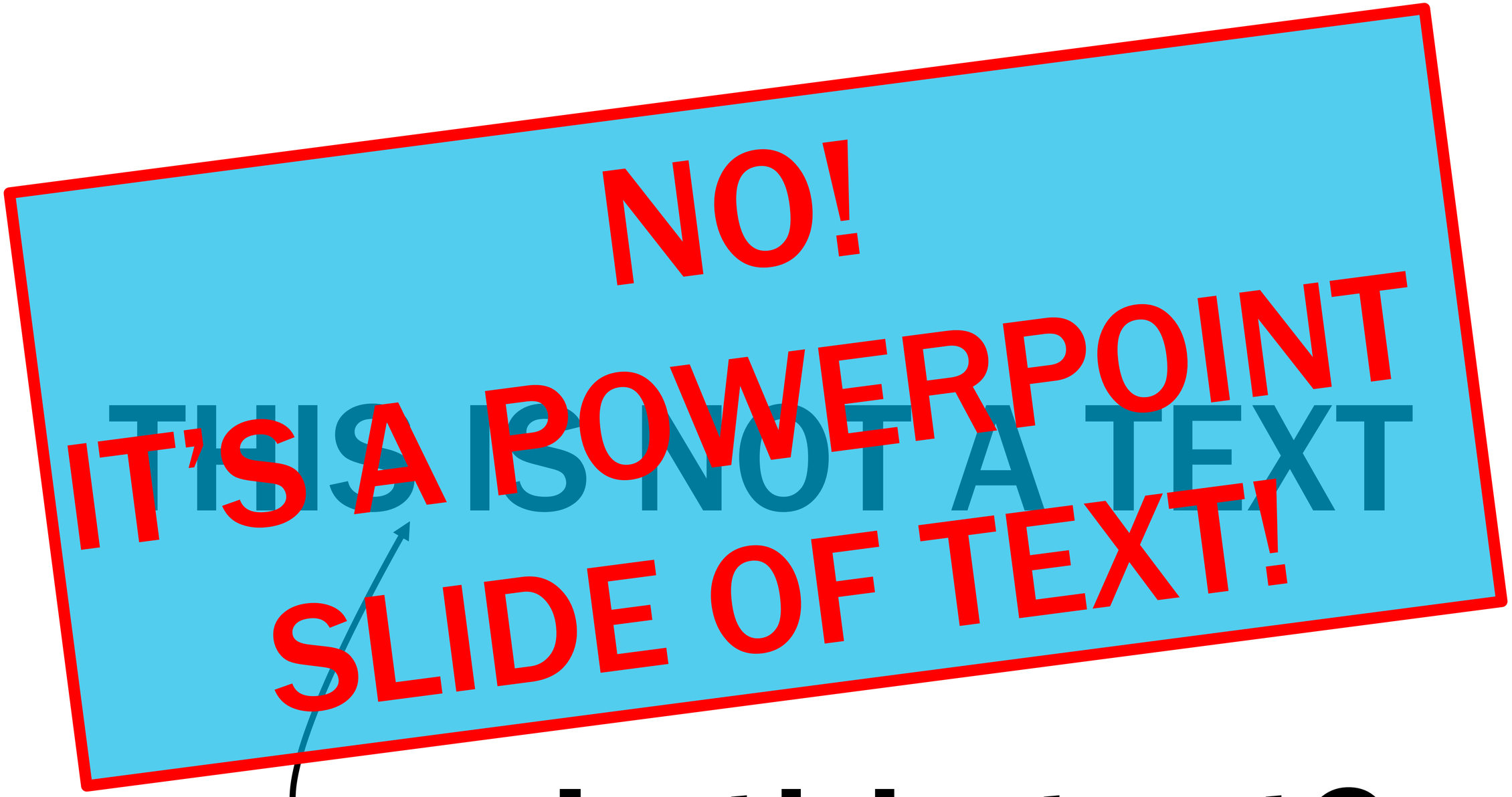
Is this a cat?

Is this a cat?

THIS IS NOT A TEXT



Is this text?



Is this text?


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

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

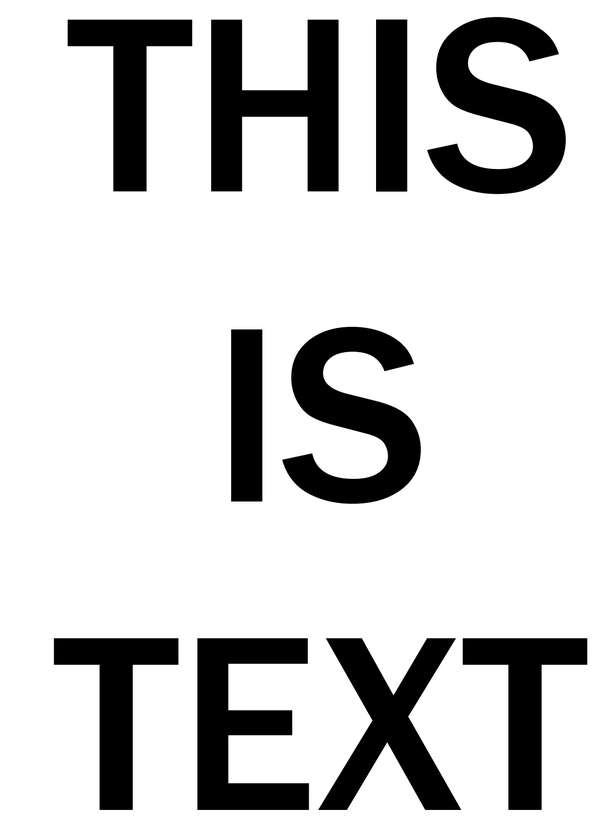
 you can read it

THIS IS TEXT

What is the difference?

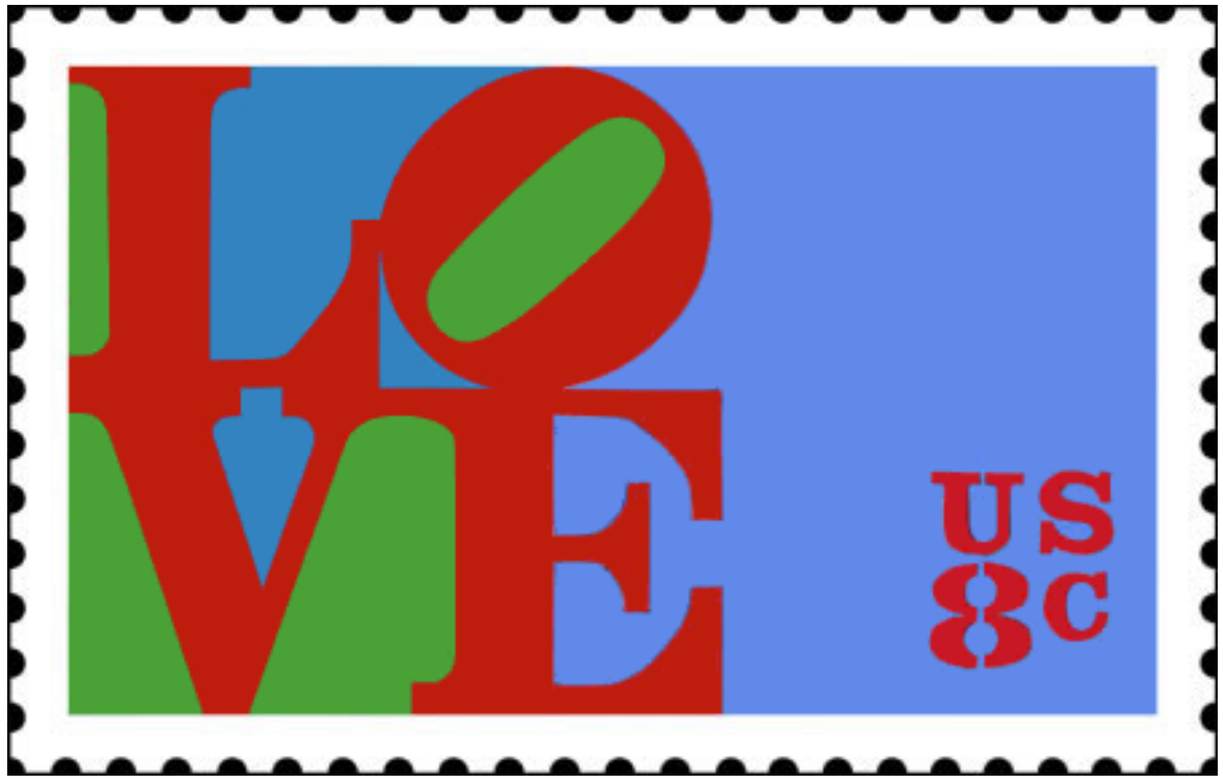
Physical cats exist.
On the left, a physical cat is depicted.
A depiction of a cat is not a cat.

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



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

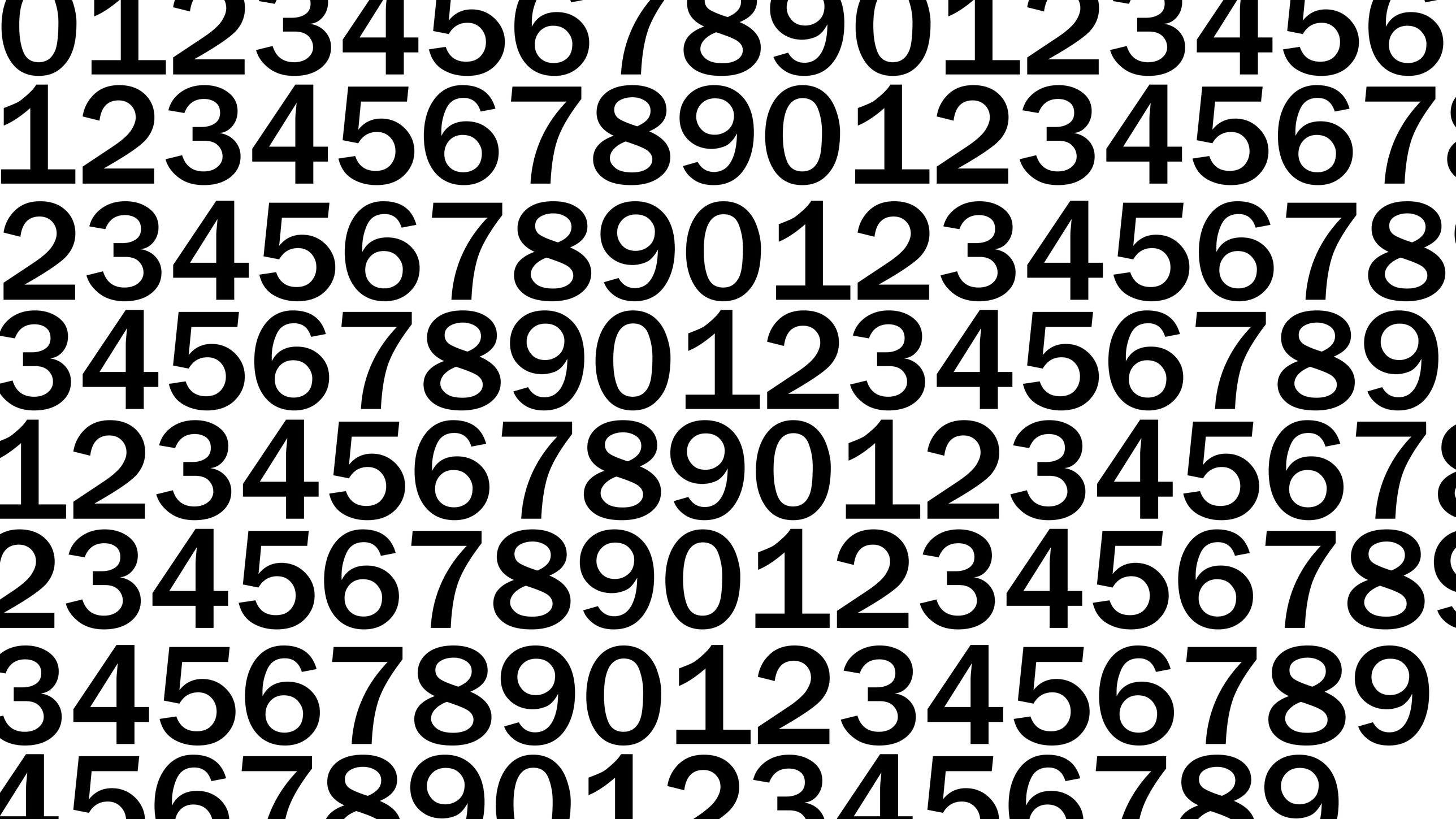
“Love” sculpture by Robert Indiana, 1970



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


THIS
IS
TEXT


SIGNS
PEOPLE
AGREE
ON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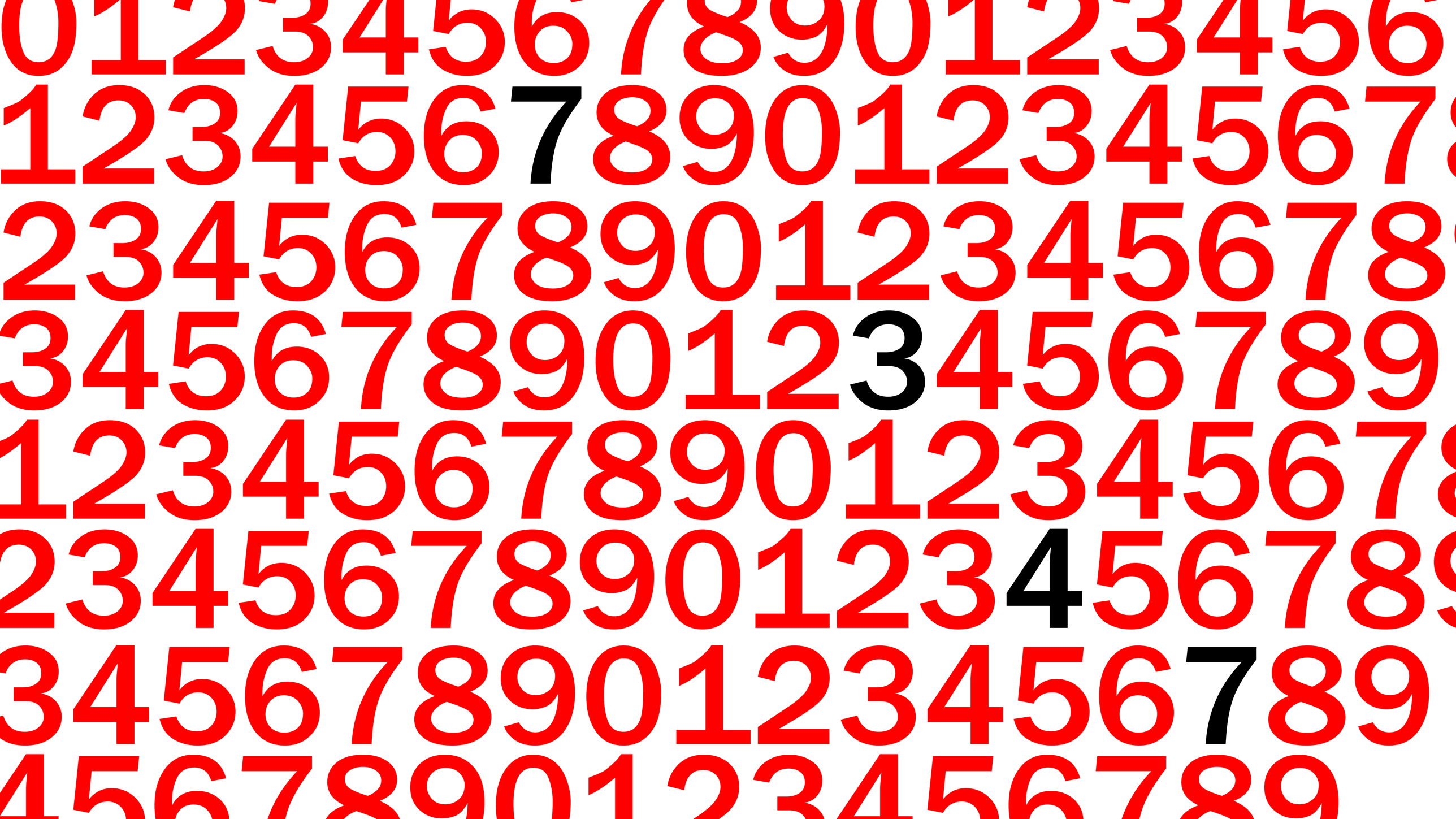
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7890123456789012345
8901234567890123456
9012345678901234567

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

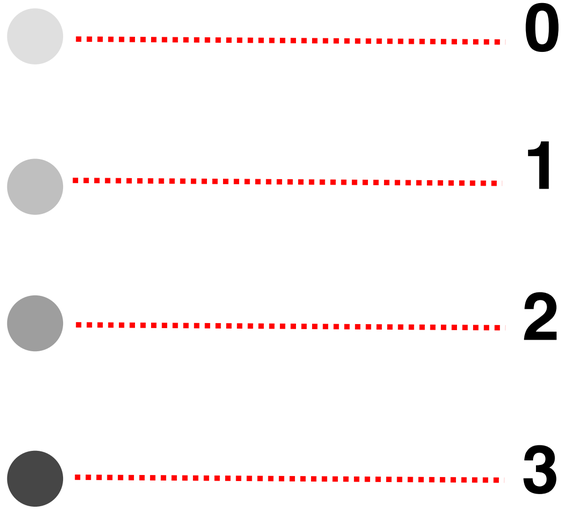
ENCODING [ɪnˈkəʊdɪŋ]: biunivocal correspondence between a set of entities of any kind and a set of natural numbers.

biunivocal correspondence

between a set of entities of any kind

and a set of natural numbers.

ENCODING




That's all Folks!

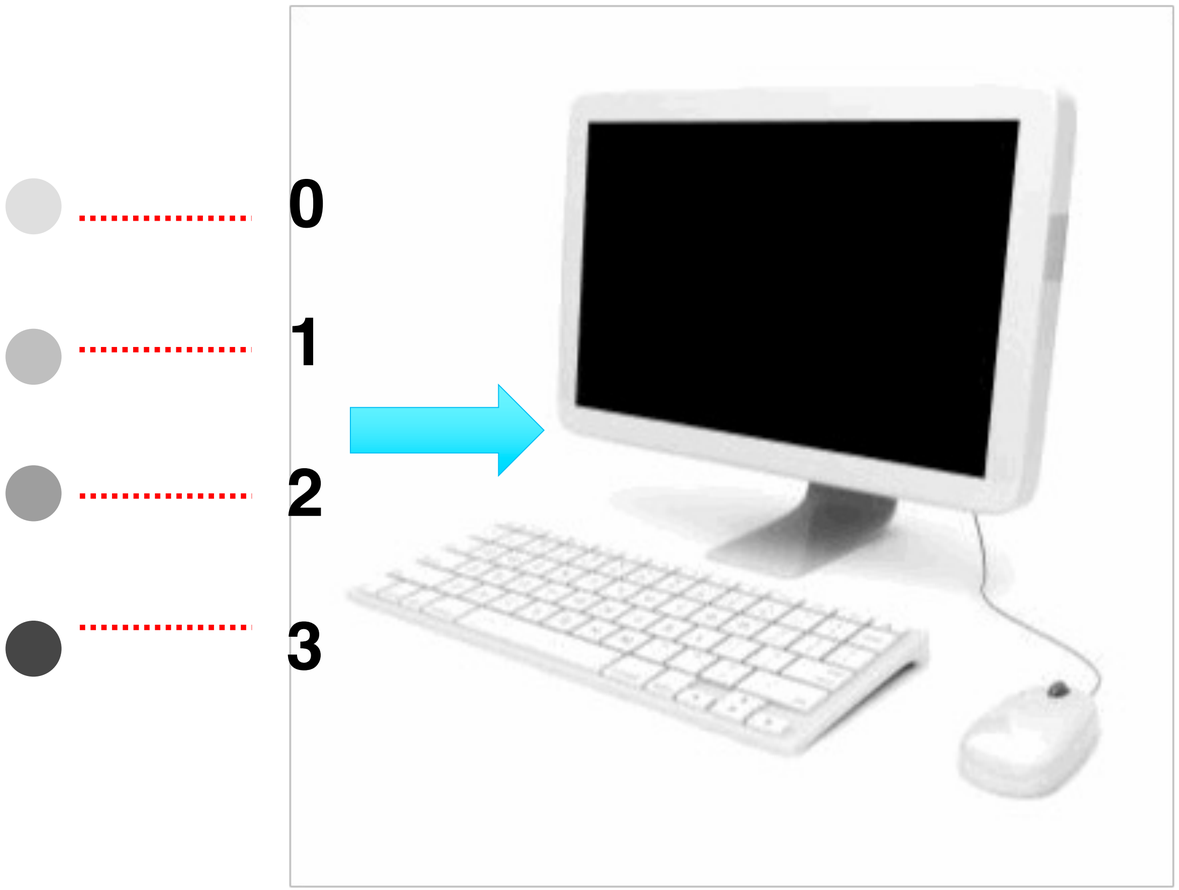
*

*from a conceptual perspective

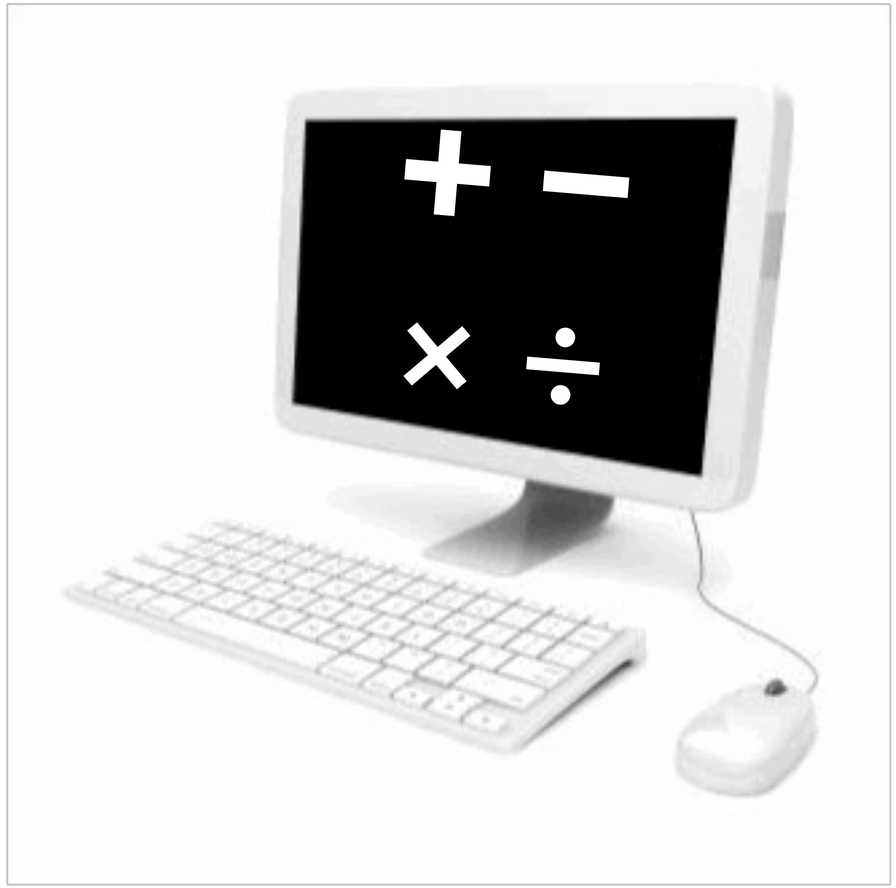
A computer.

It only works with numbers.

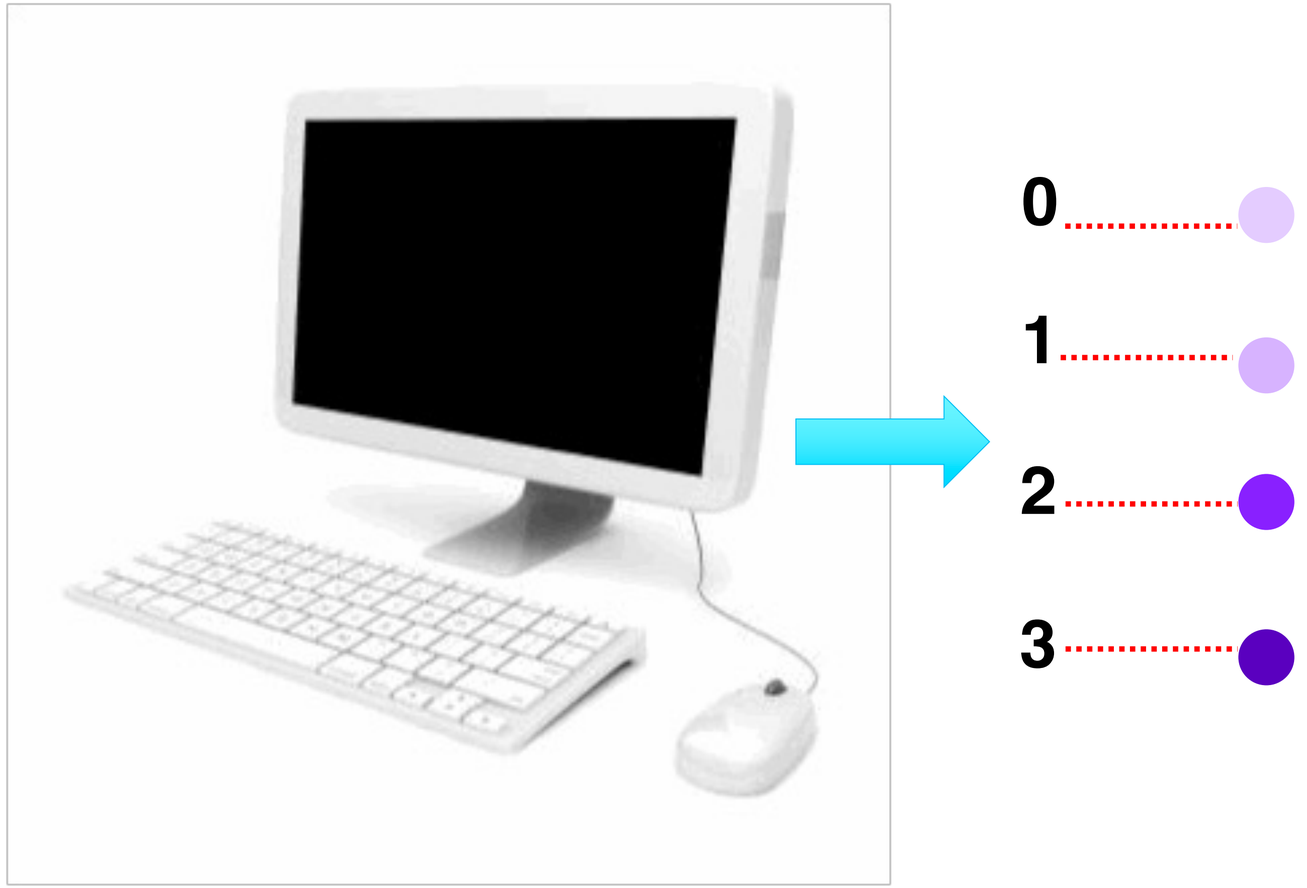
It cannot work with anything else.



Input needs to be ENCODED.



The computer works.

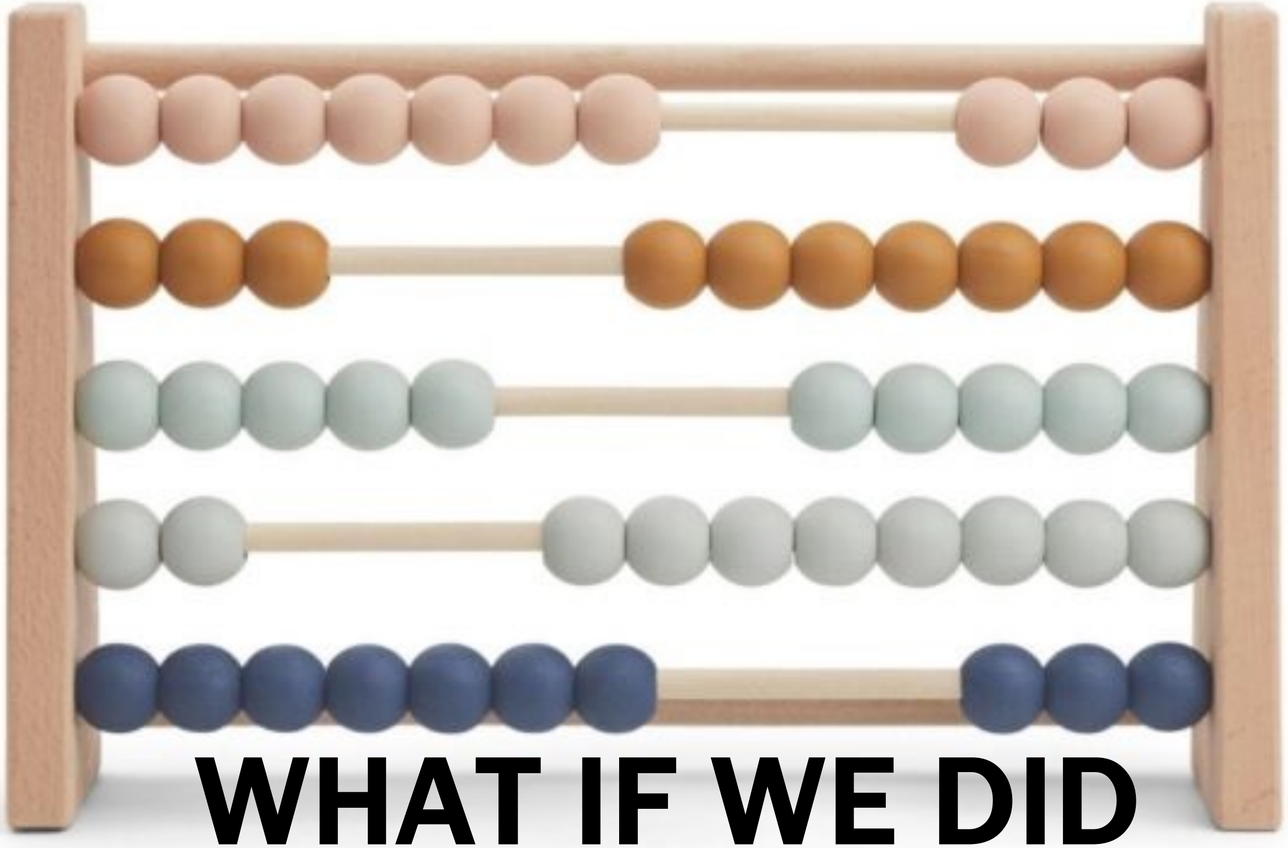


Output needs to be DECODED.

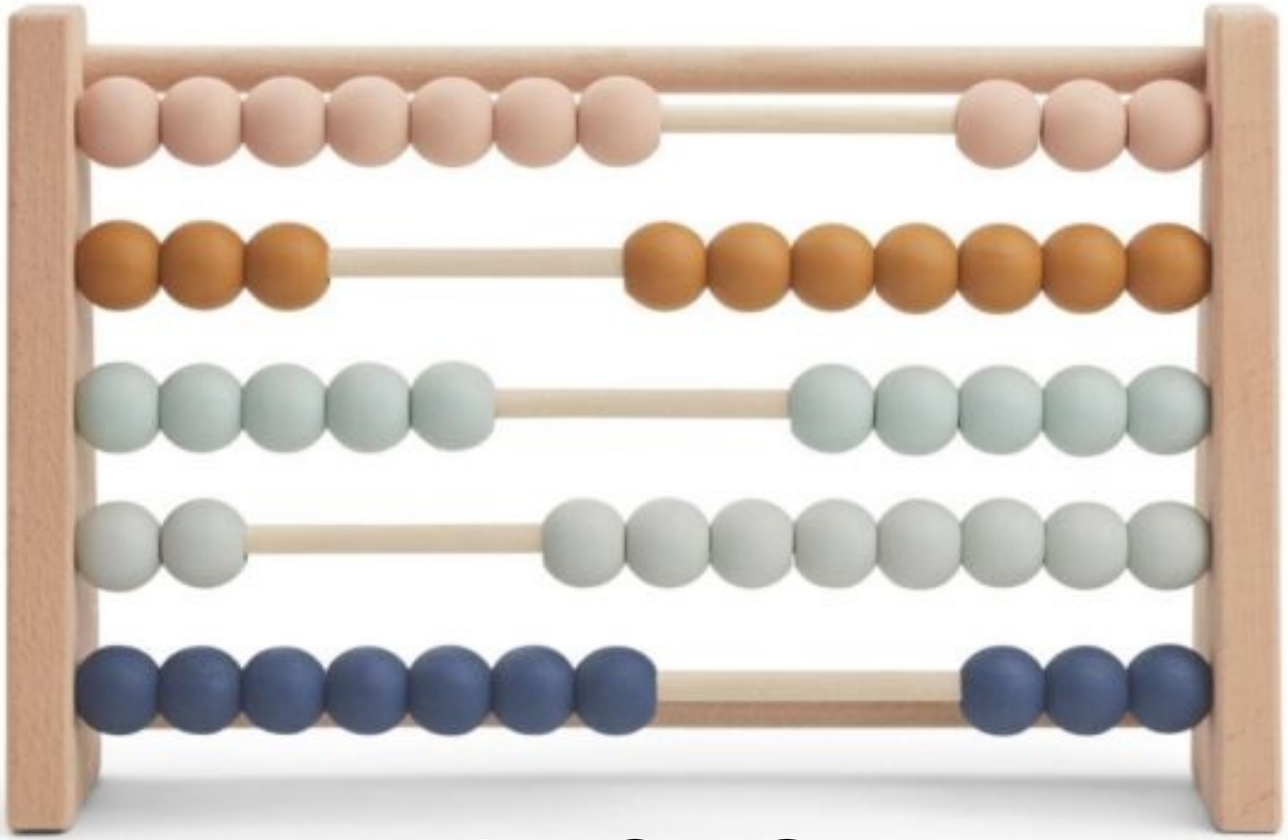
COMPUTER SCIENCE

WAIT!

THIS IS HOW DIGITAL TECHNOLOGY WORKS

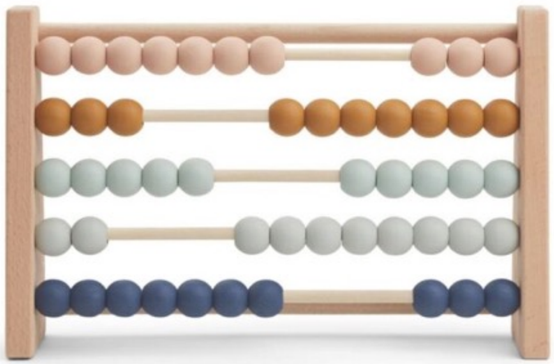


WHAT IF WE DID COMPUTATION ON AN ABACUS?

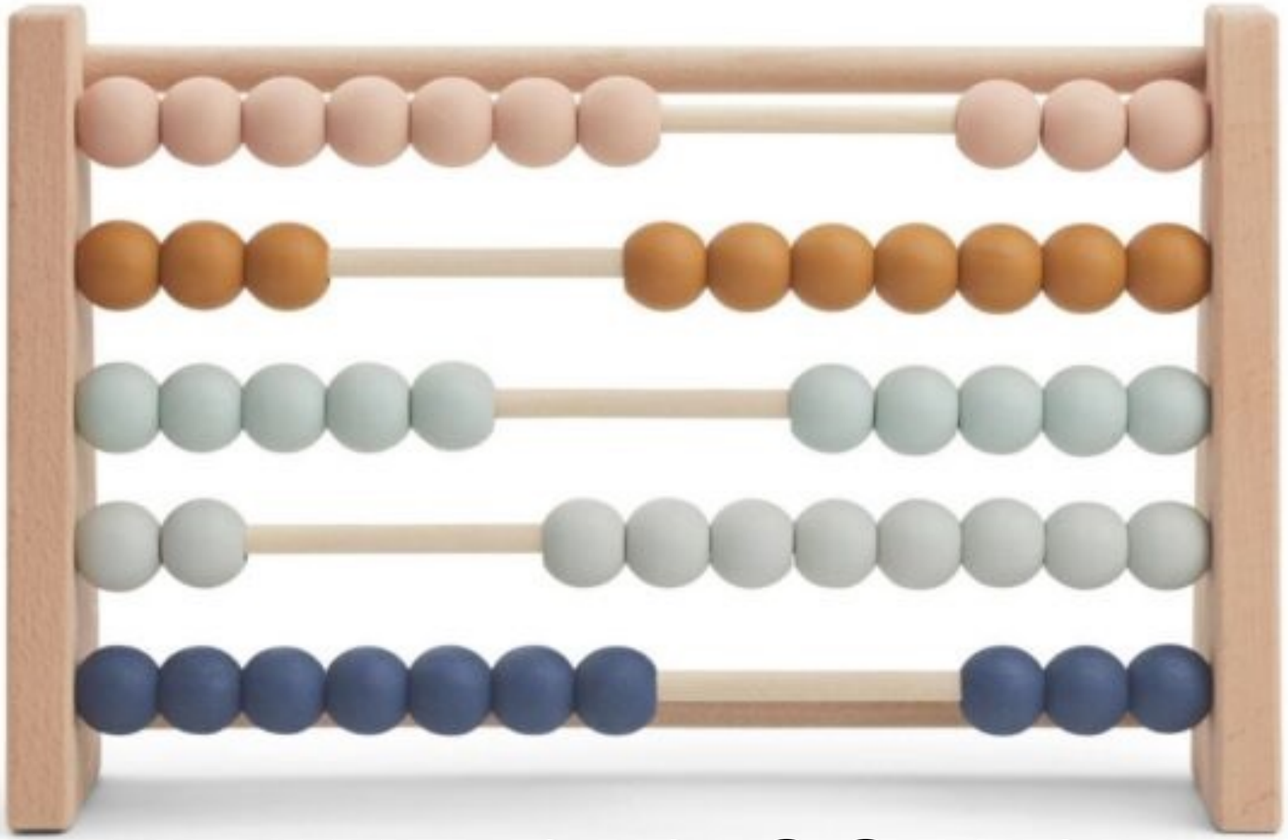


ABACUS:
THE OTHER ANALOG COMPUTER


FINGERS:
THE FIRST ANALOG COMPUTER

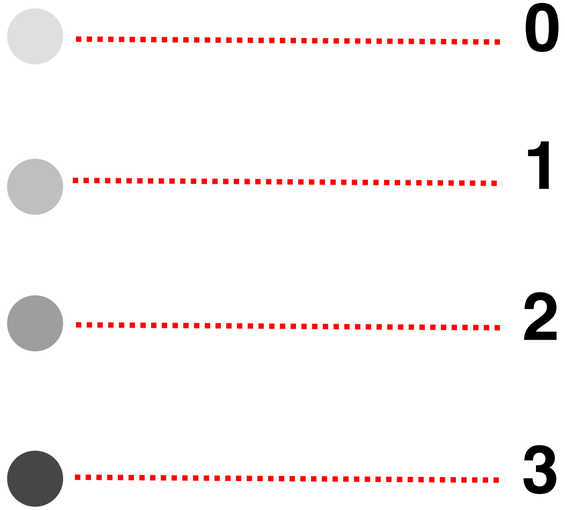


VS.

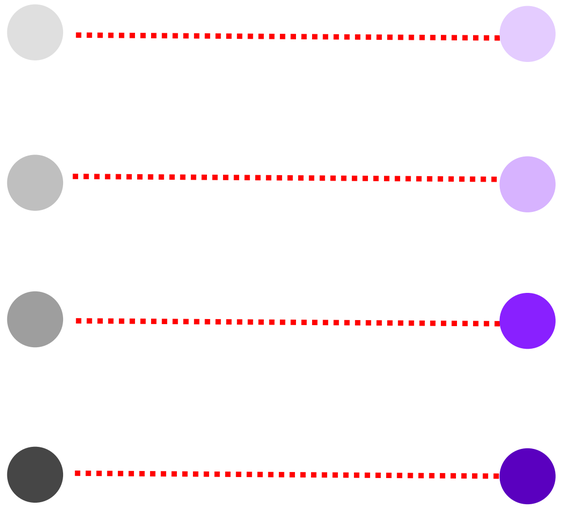


WHAT IF WE DID COMPUTING ON ABACUSES? (ABACI?)

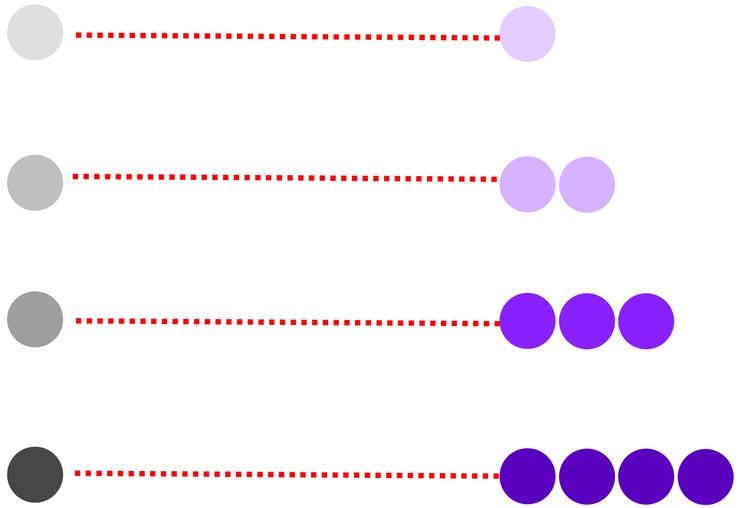
ENCODING?



~~ENCODING?~~

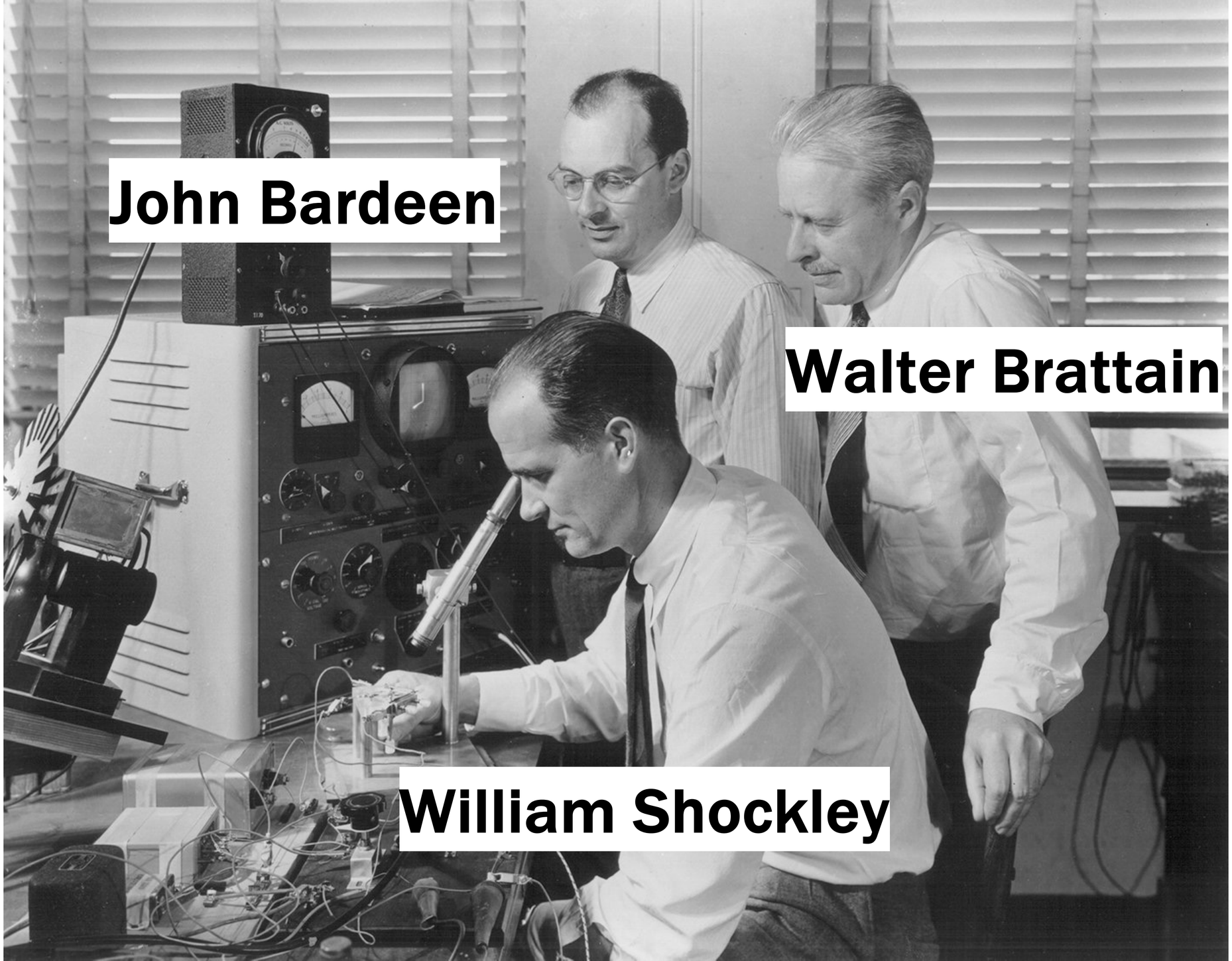


~~ENCODING?~~



WE HAVE ENCODING BECAUSE COMPUTERS ARE DIGITAL

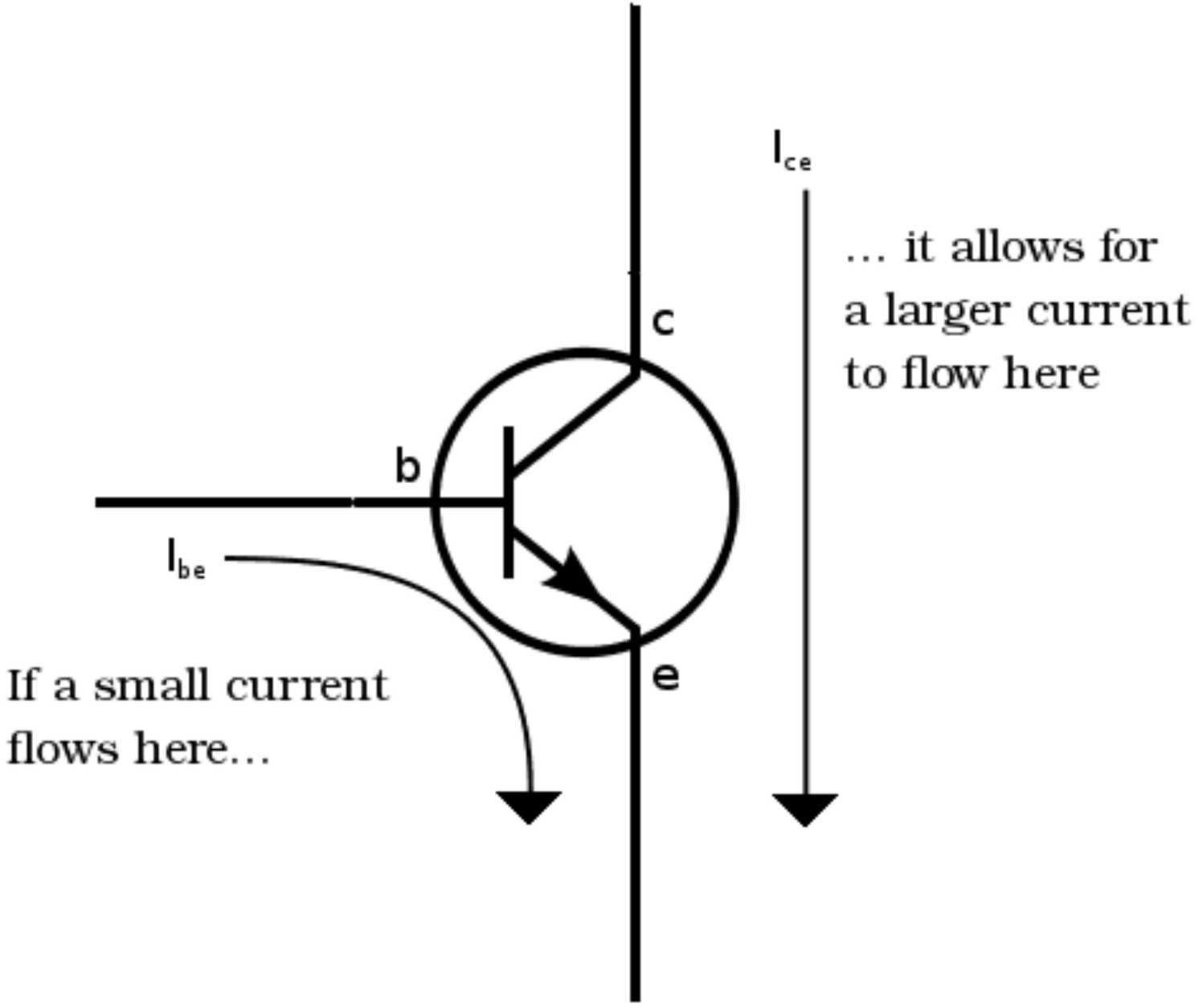
WE HAVE ENCODING BECAUSE COMPUTERS HAPPEN TO BE DIGITAL

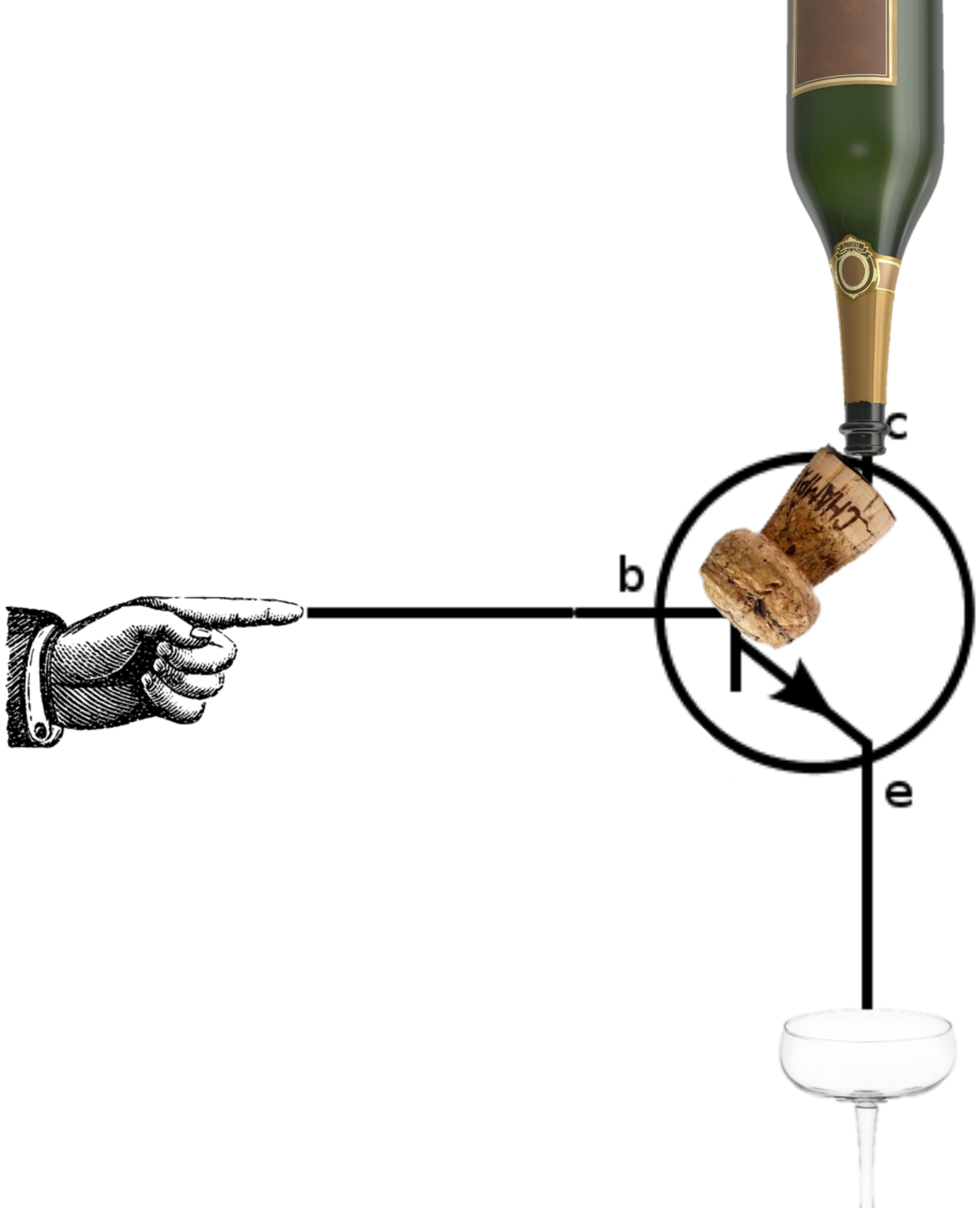

John Bardeen
Walter Brattain
William Shockley

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}
e
If a small current
flows here…


c
b
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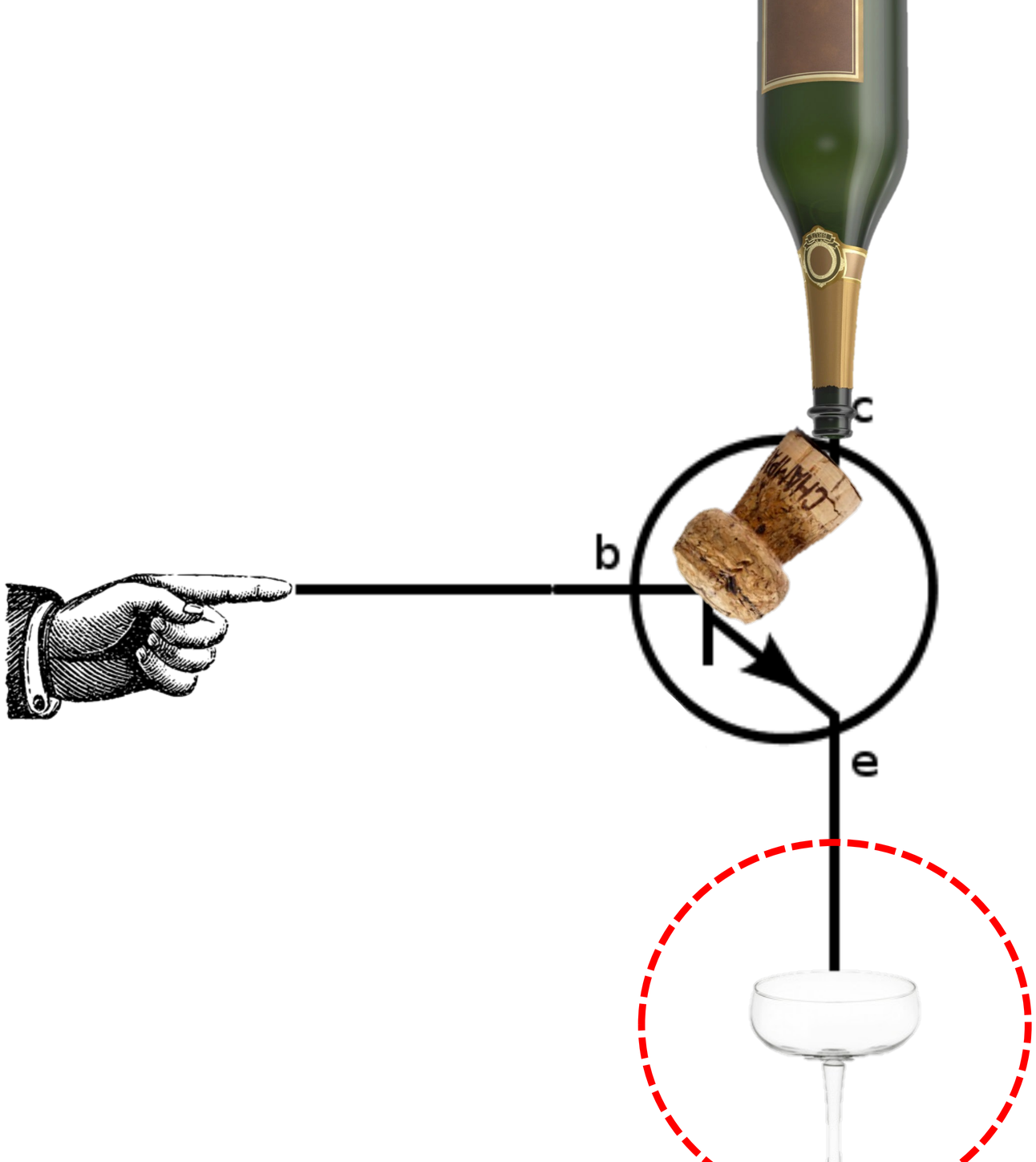
c
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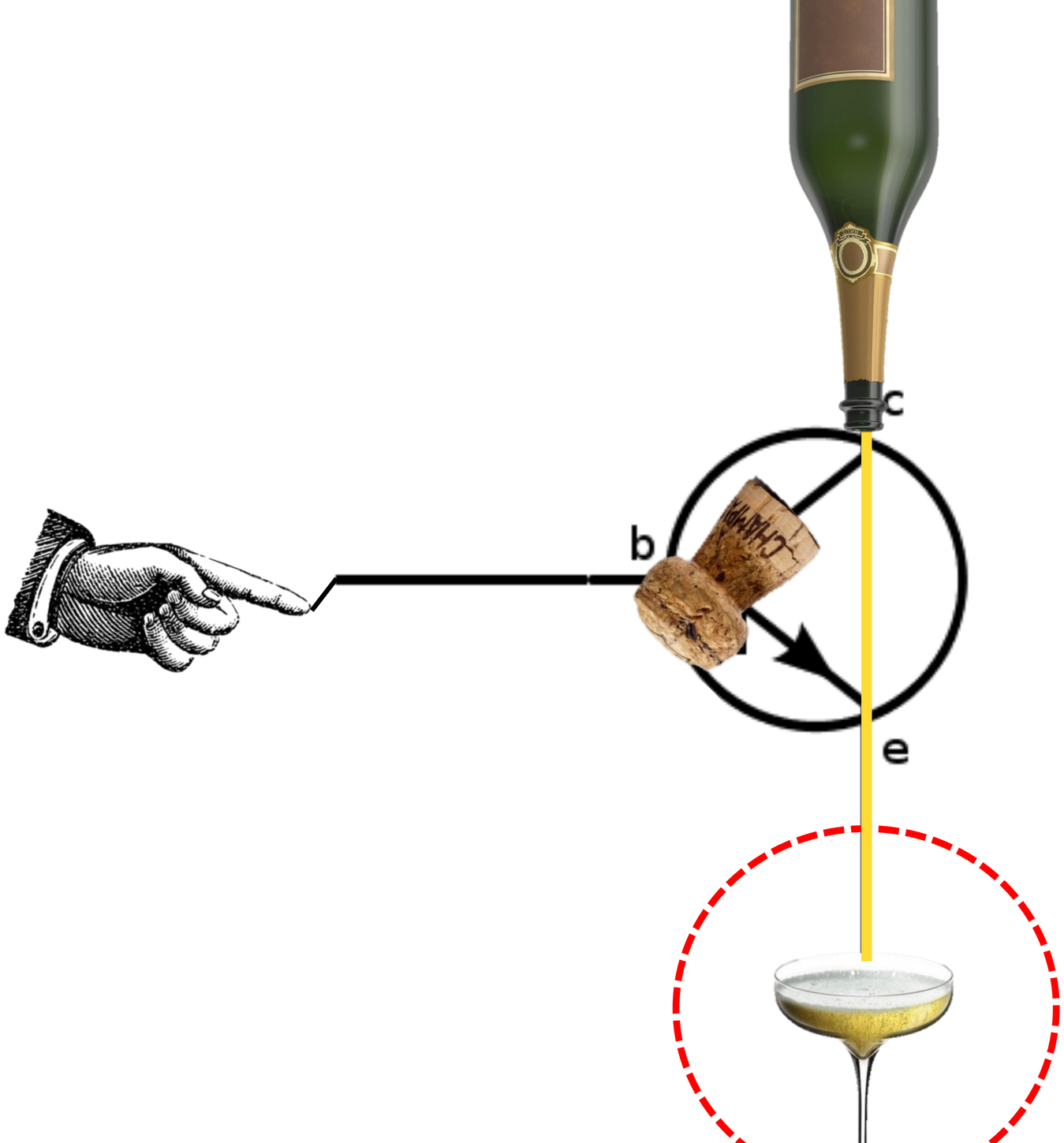
c
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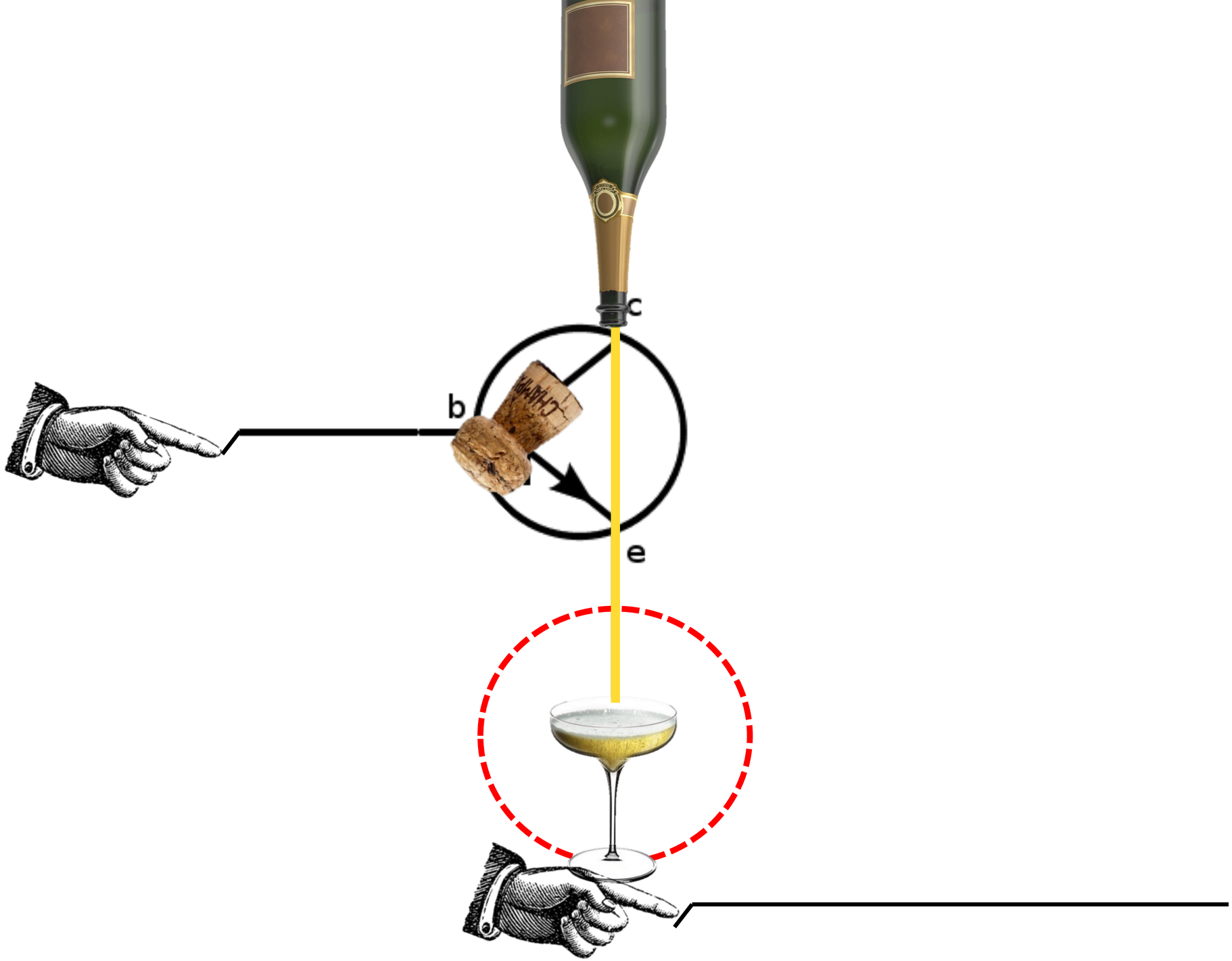
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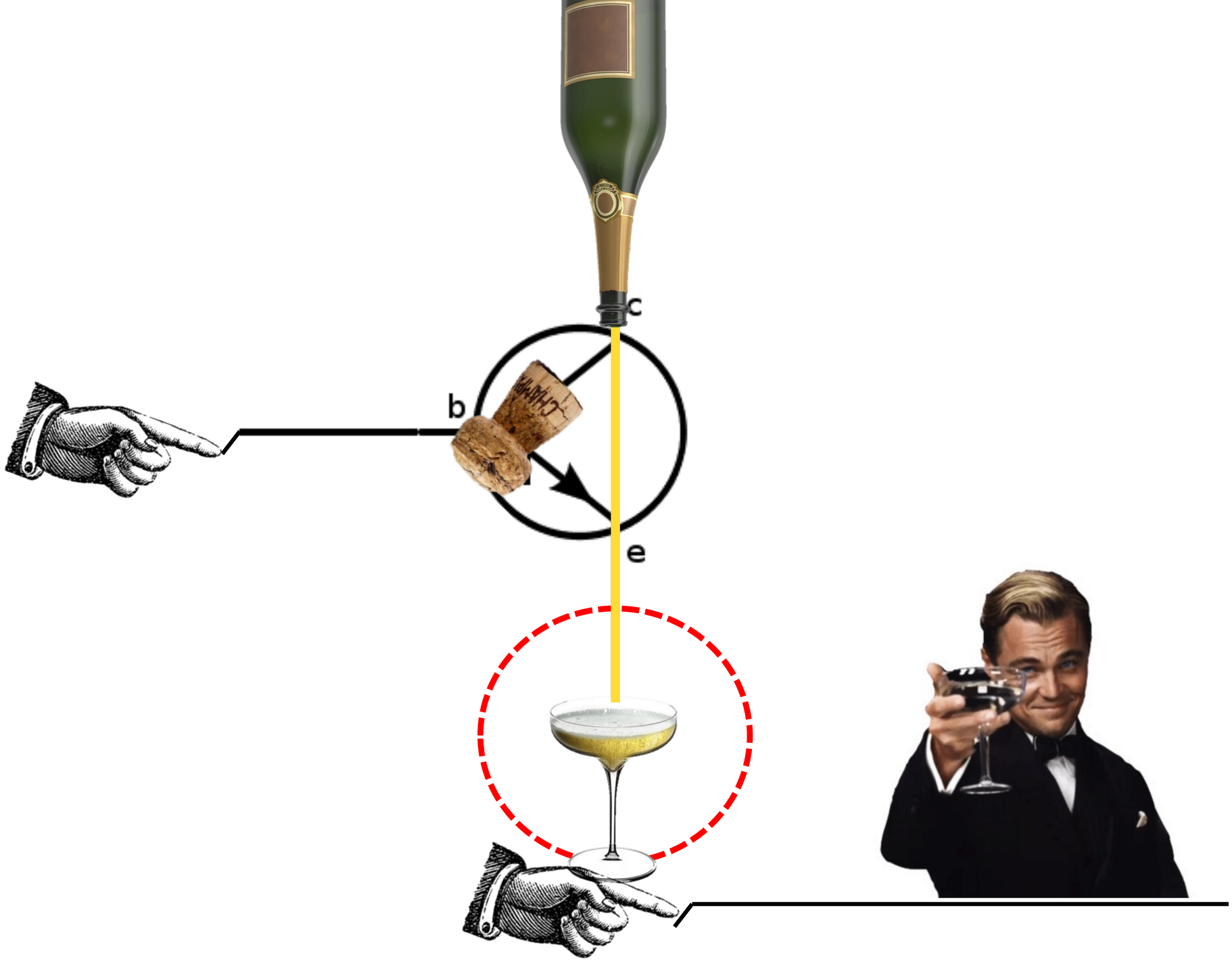
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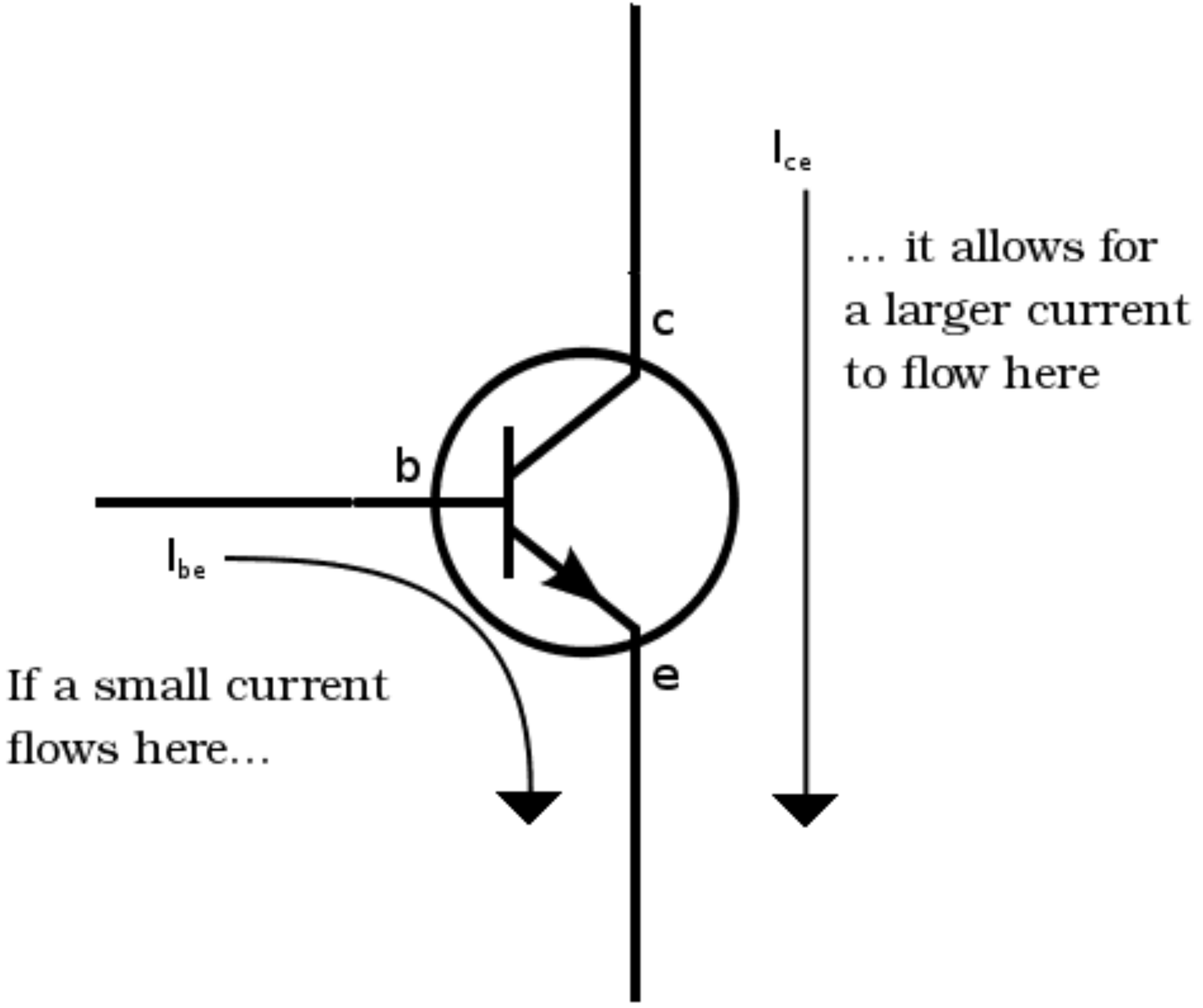
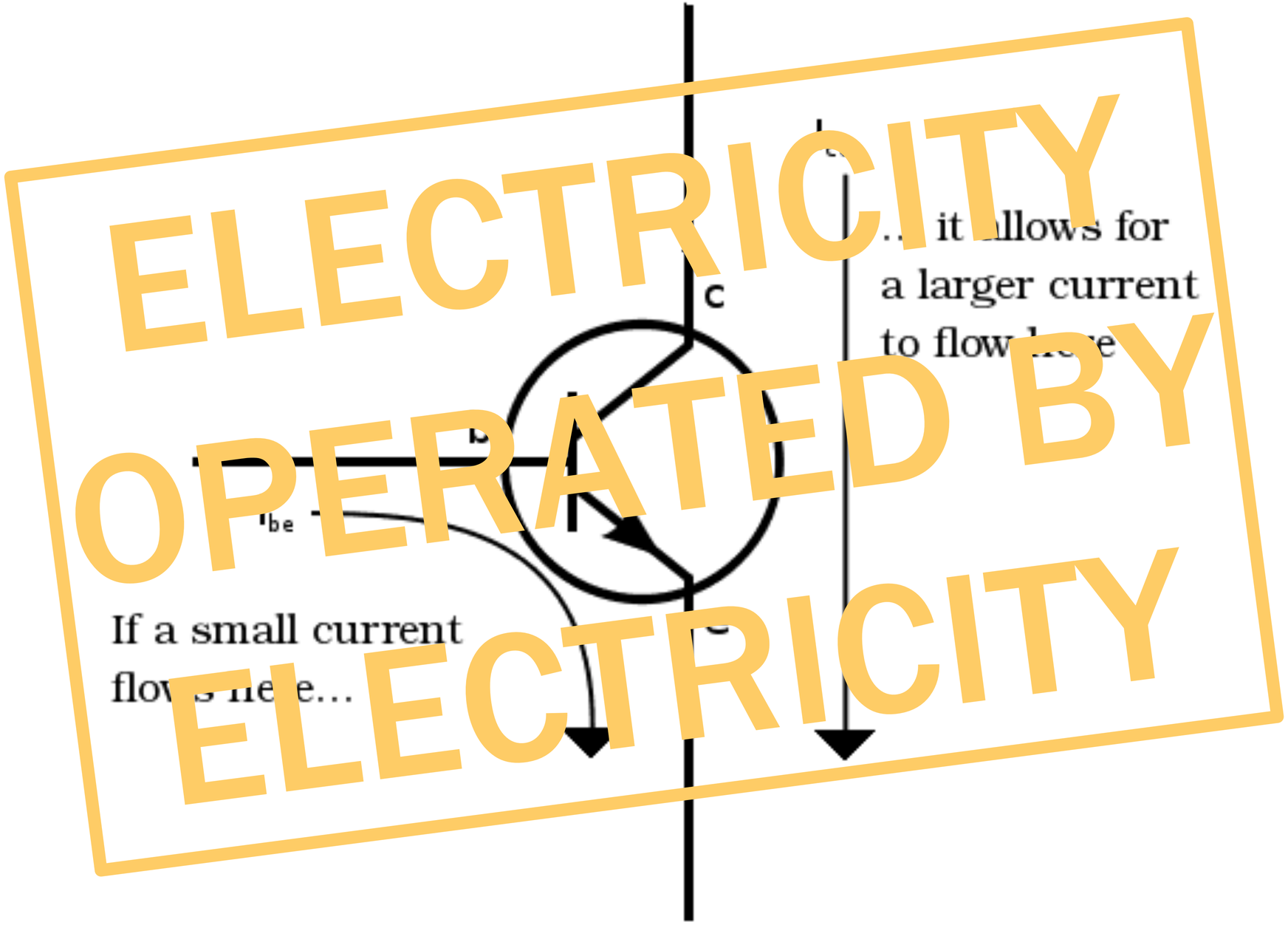

I_{ce}
… it allows for
a larger current
to flow here
c
b
I_{be}
e
If a small current
flows here…




cruzer
micro
4 GB


100%
09:45
AM WED 6/12
6410


10:00
10:00
10/08/2020


micro
4 GB
cruzer
WED
6410
10:00
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

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

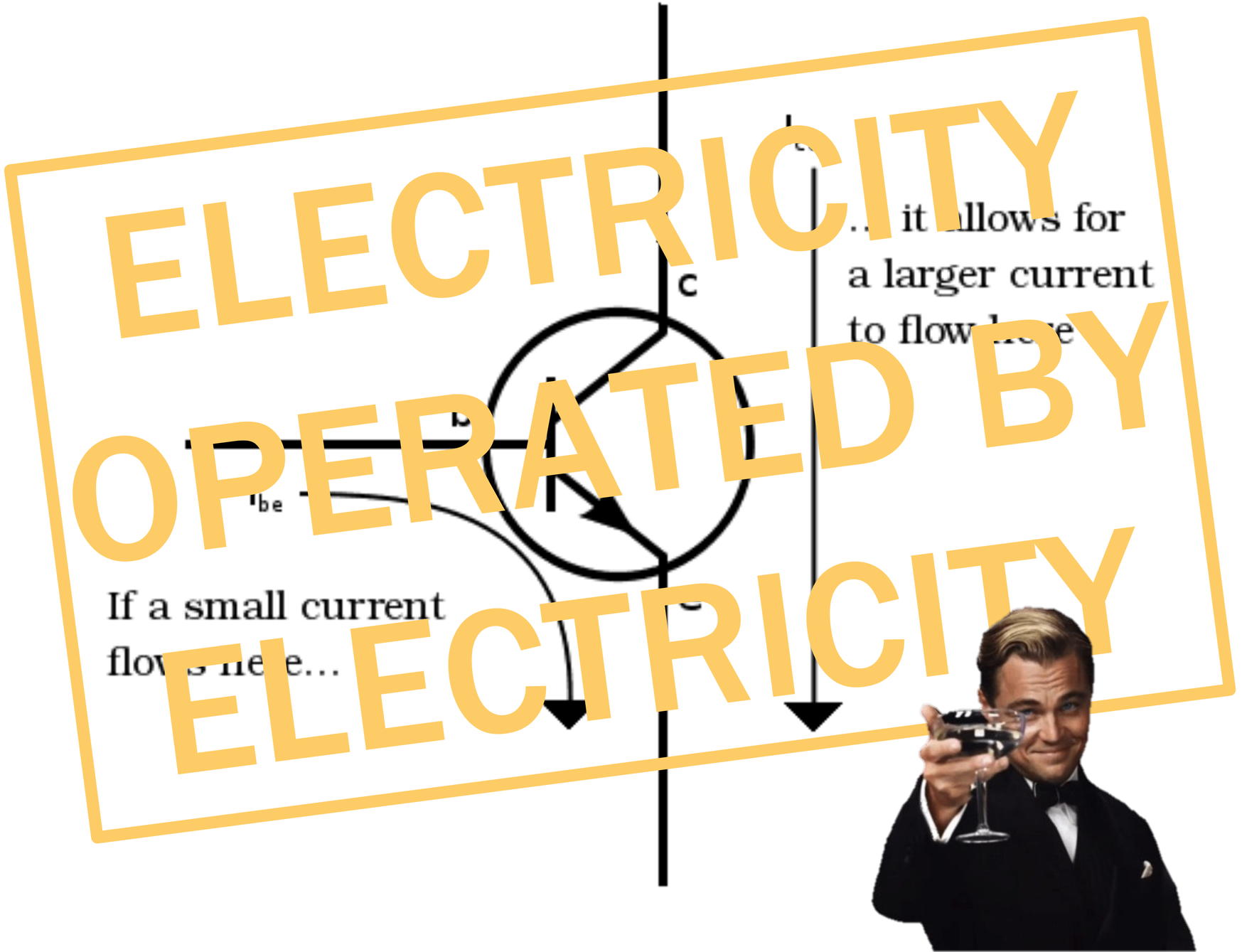
DIRECTED BY FRED McLEOD WILCOX · PRODUCED BY NICHOLAS NAYFACK IN CINEMASCOPE AND COLOR

A METRO-GOLDWYN-MAYER PICTURE


BIG MACHINE.


NO INSTRUMENTALITIES.


Dubbed in Italian:
SENZA MECCANISMI.


C
B
I_{be}
If a small current
flows here...
... it allows for
a larger current
to flow 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

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

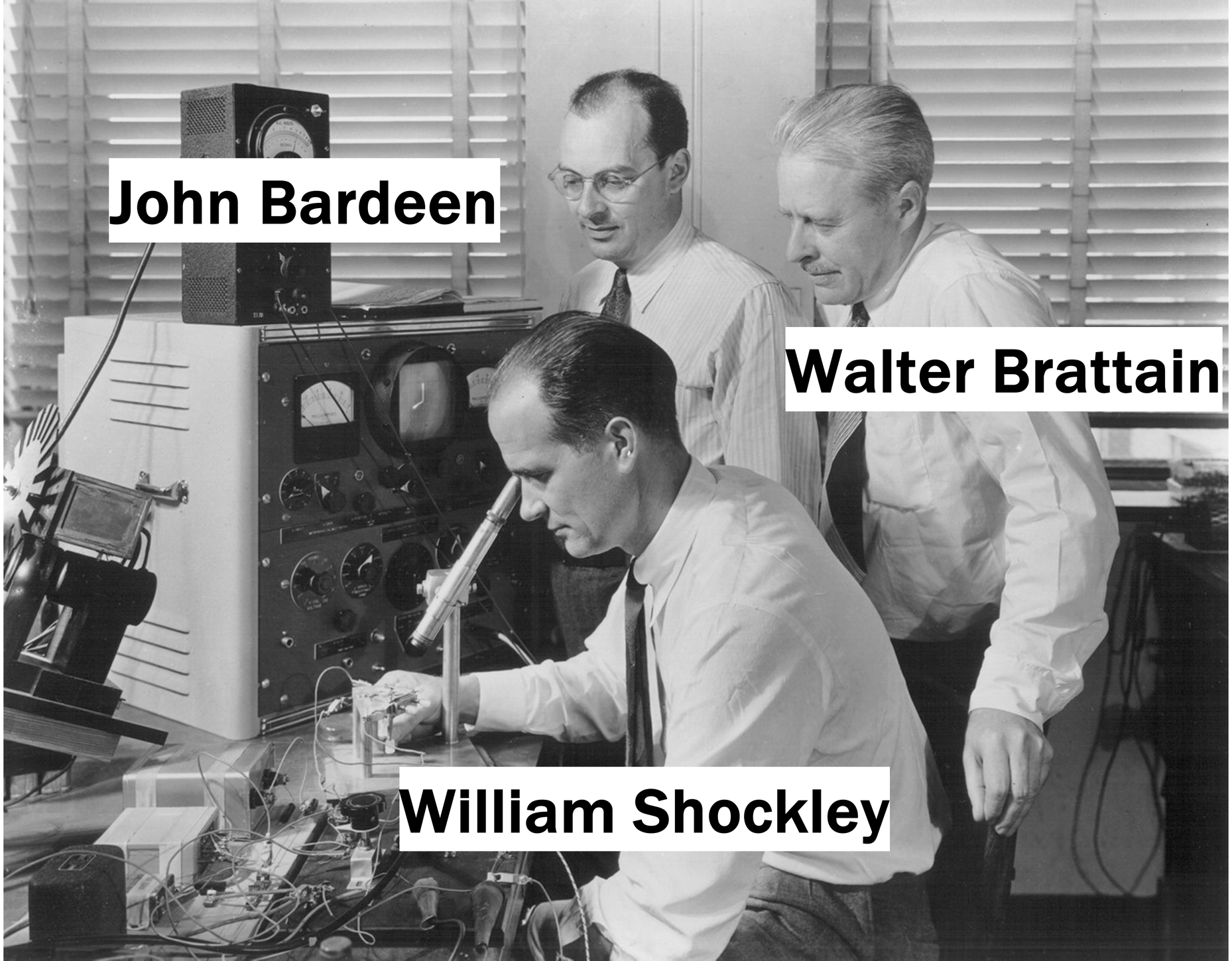
SCREEN PLAY BY CYRIL HUME

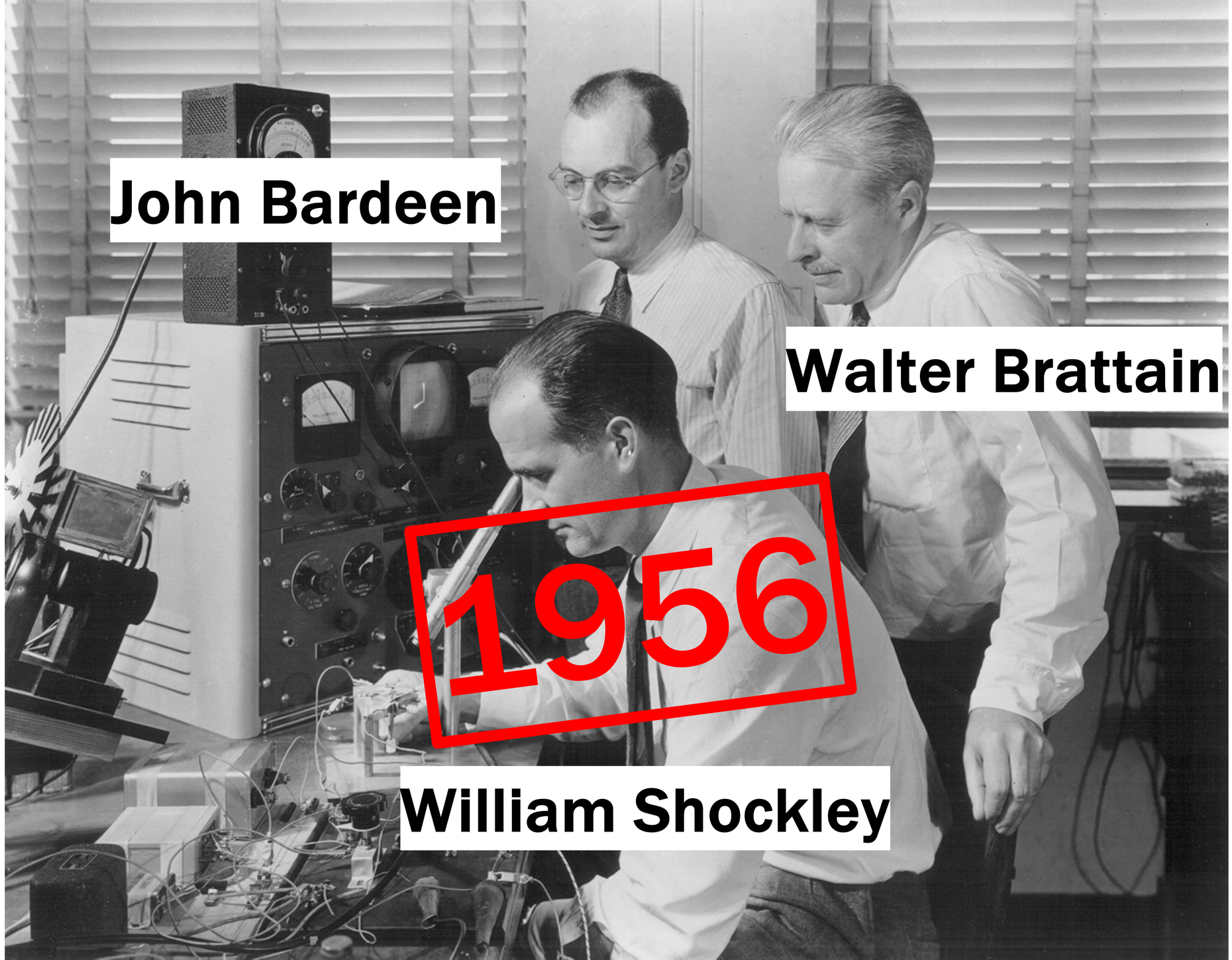
PHOTOGRAPHED IN EASTMAN COLOR

DIRECTED BY FRED McLEOD WILCOX · PRODUCED BY NICHOLAS NAYFACK IN CINEMASCOPE AND COLOR

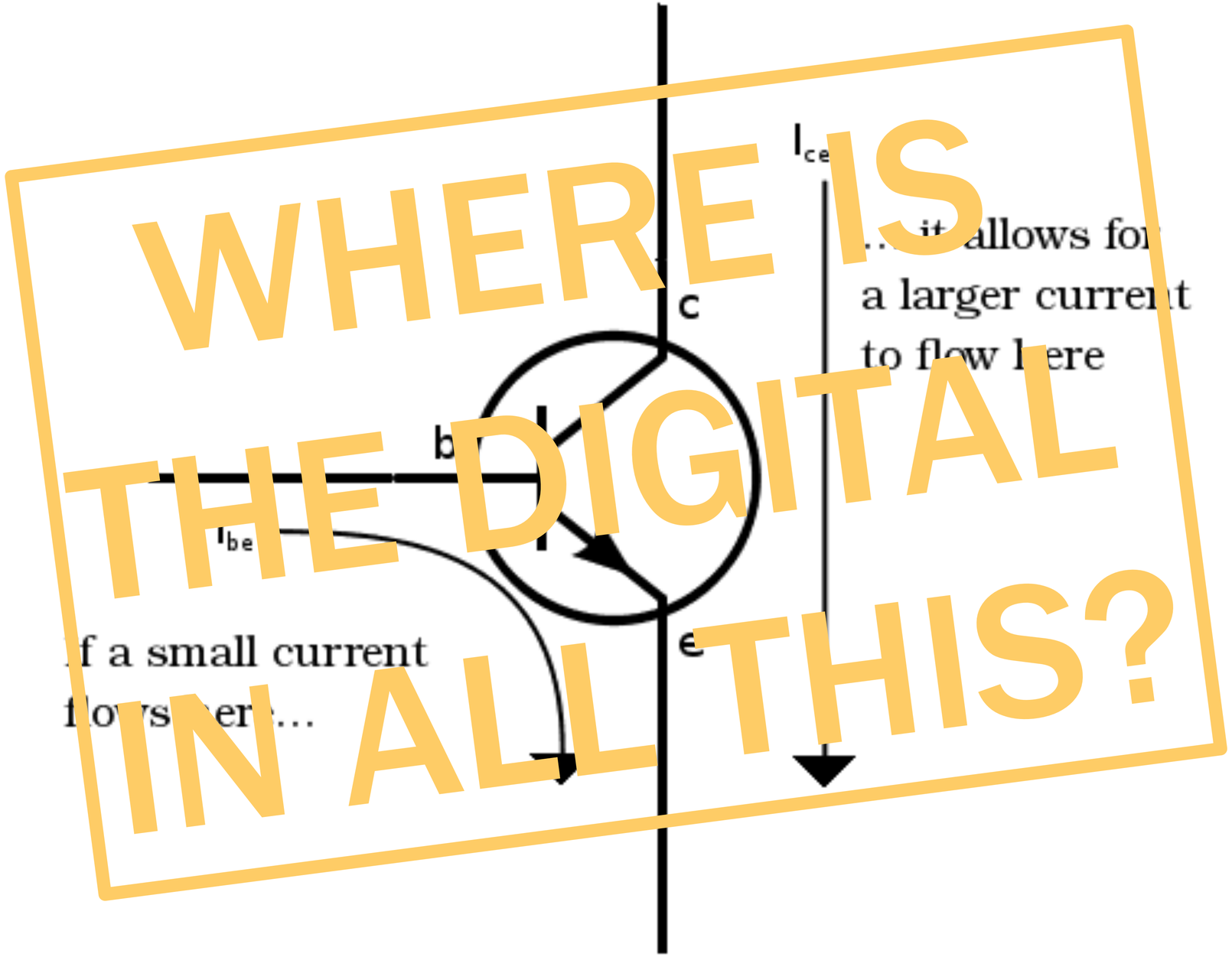
A METRO-GOLDWYN-MAYER PICTURE


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!



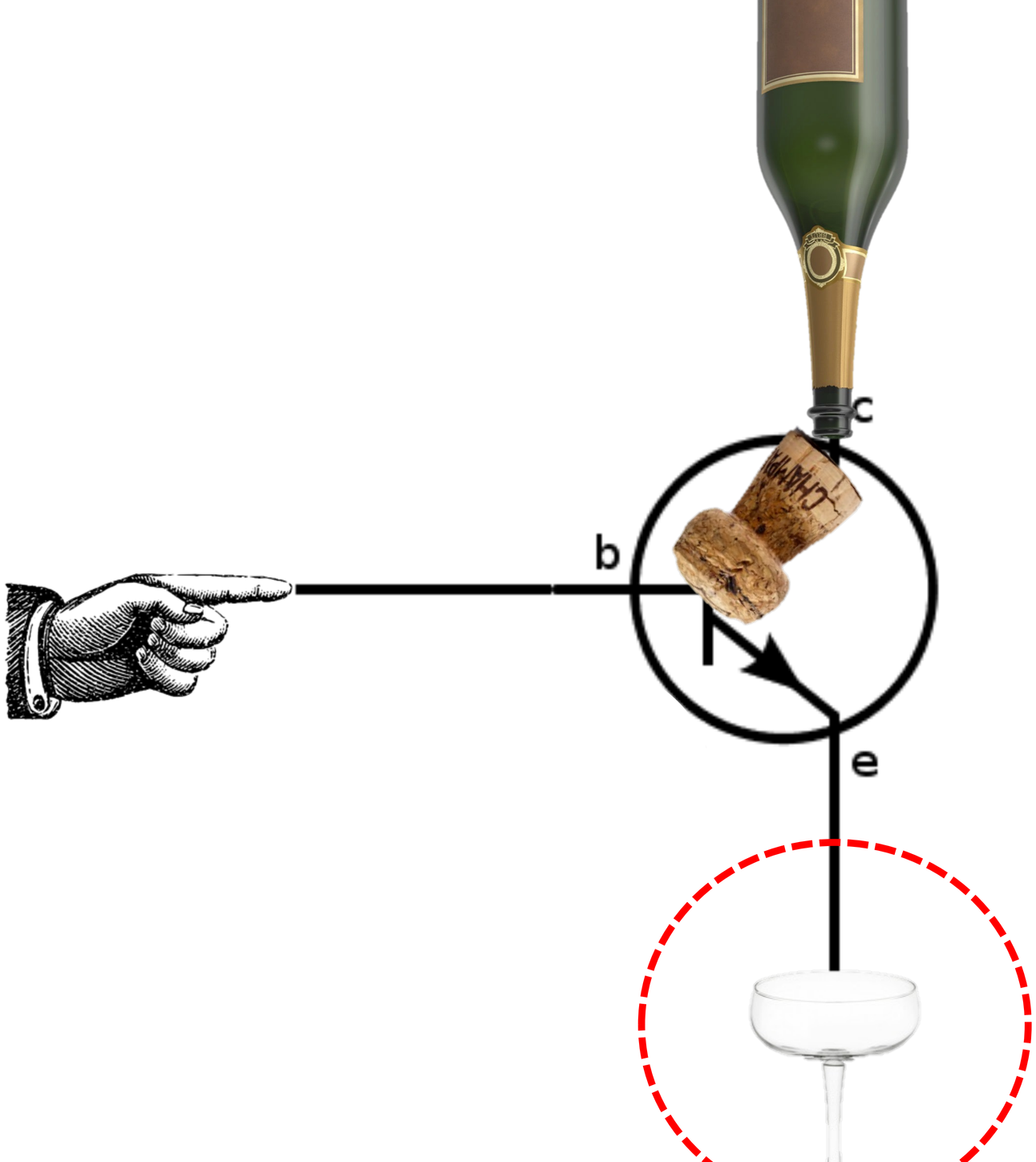
WHERE IS THE DIGITAL IN ALL THIS?

THE MOST FUNDAMENTAL ENCODING OF THEM ALL*

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

0

1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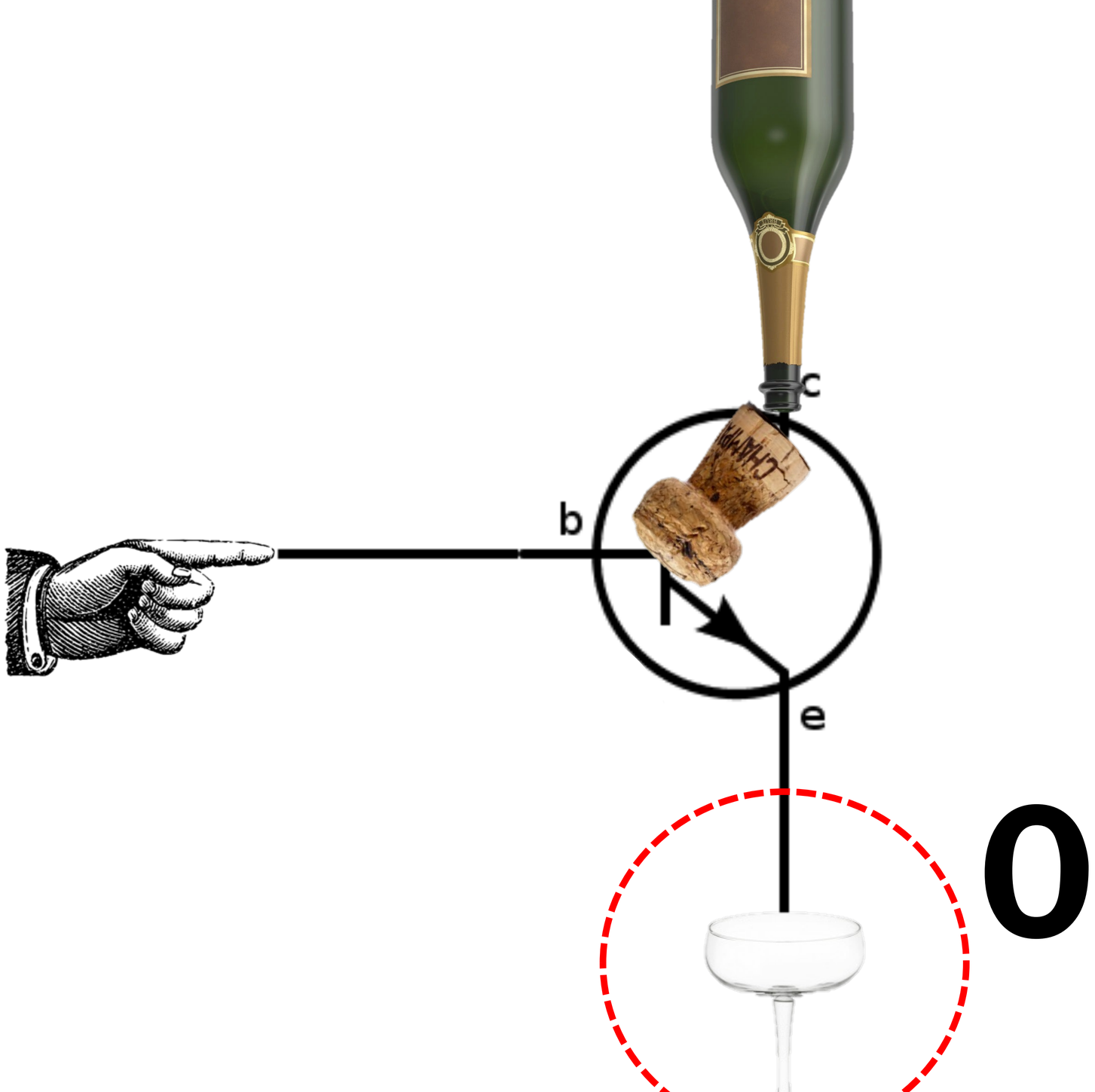

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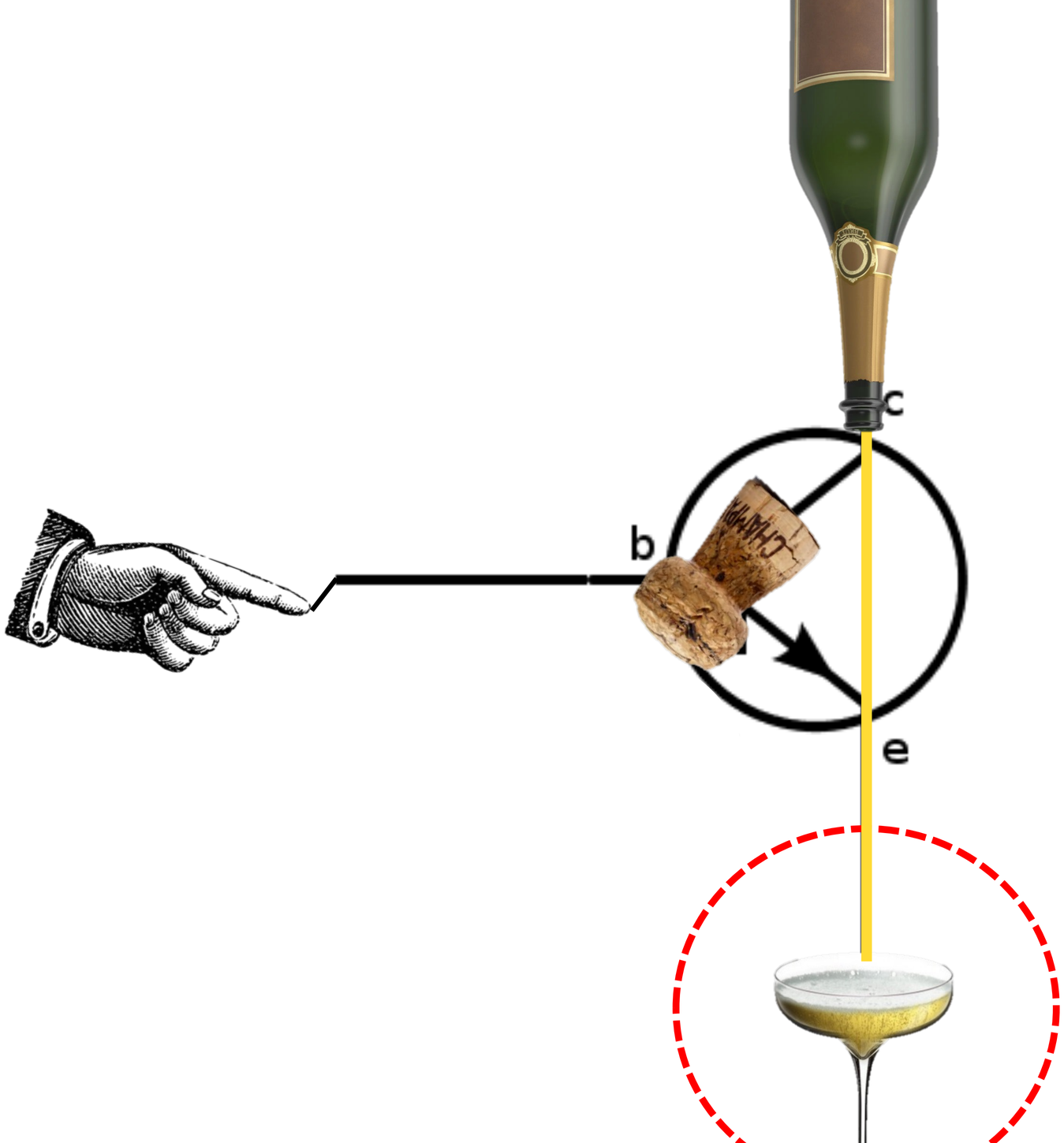
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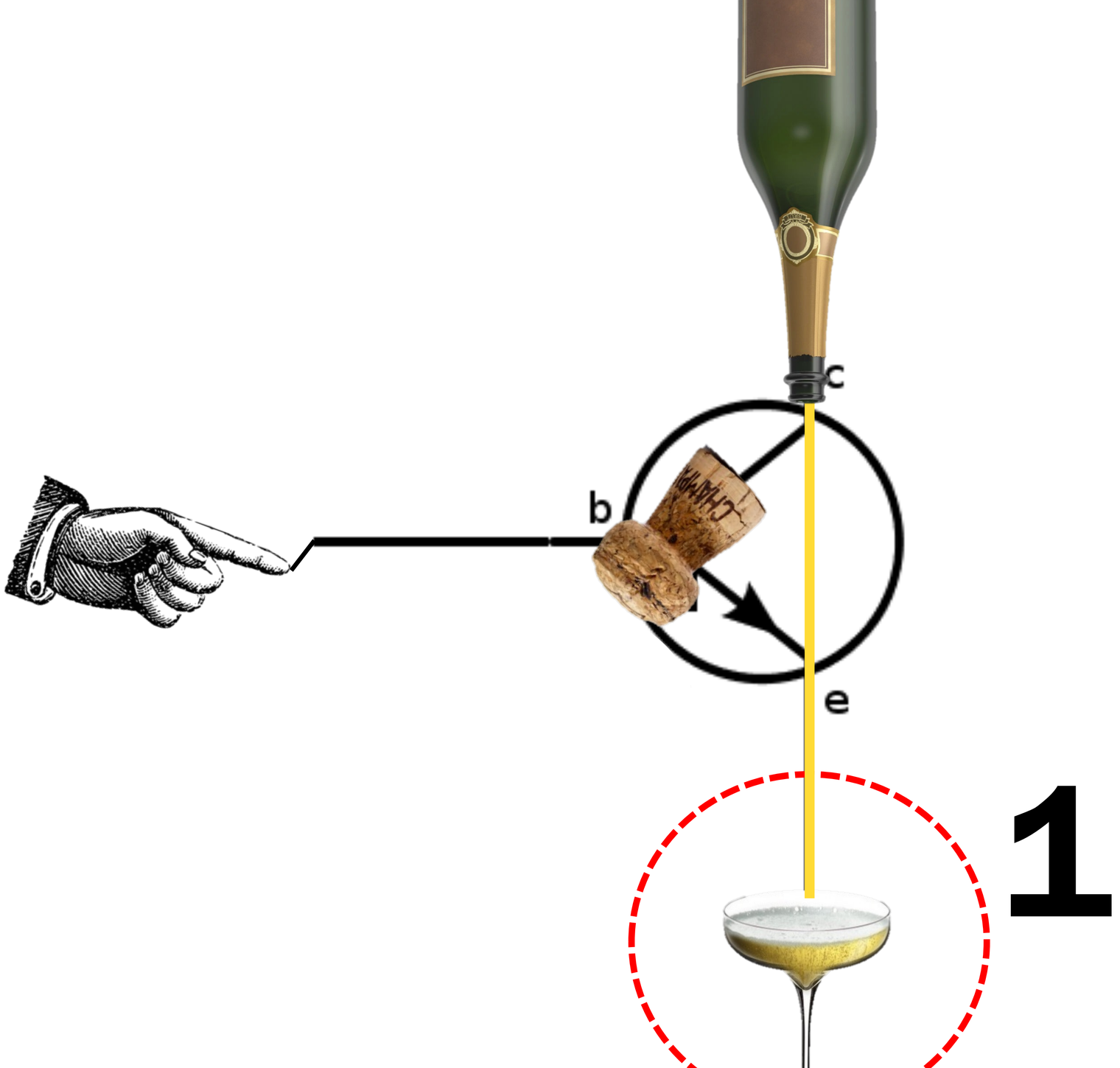
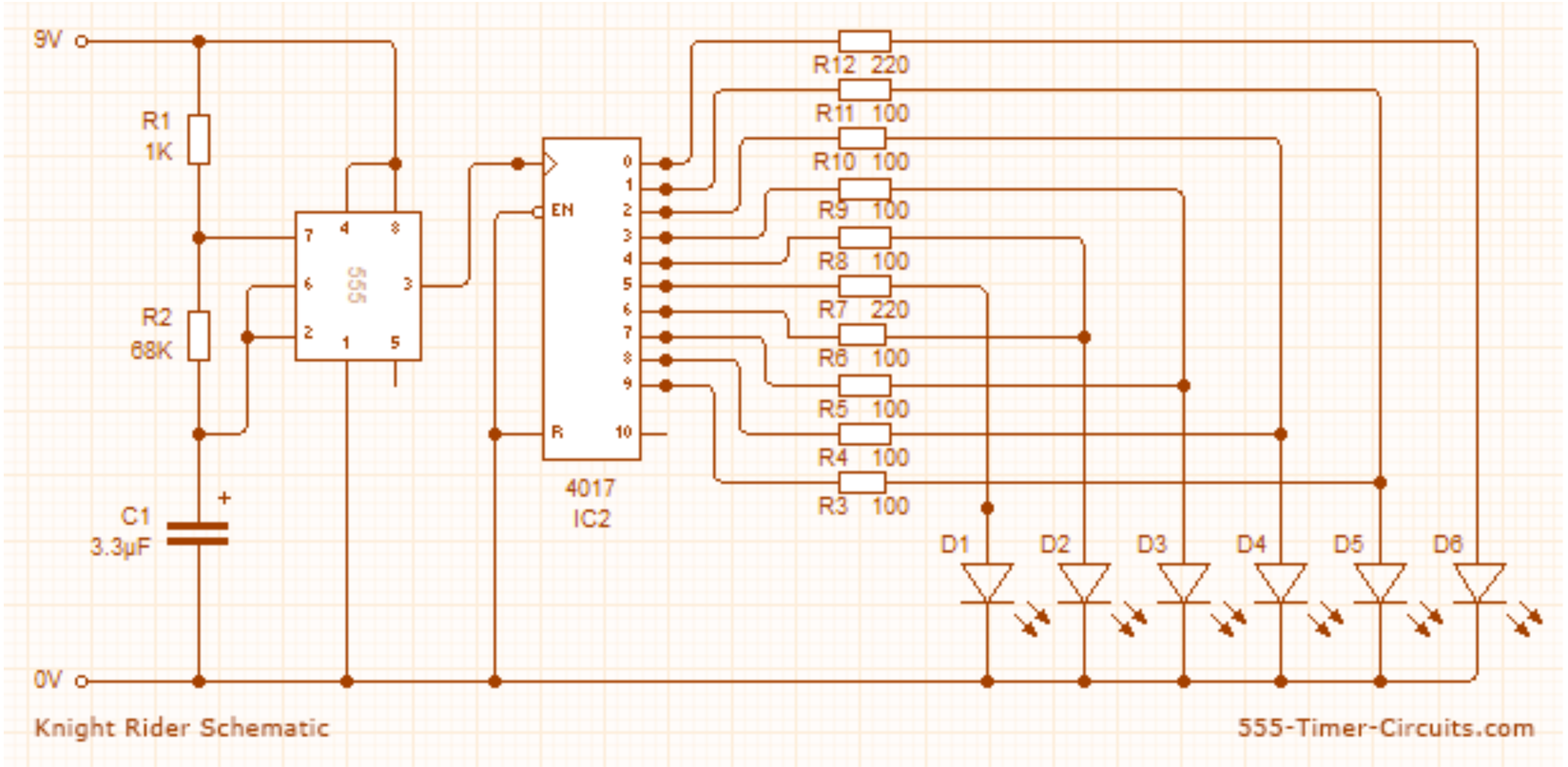
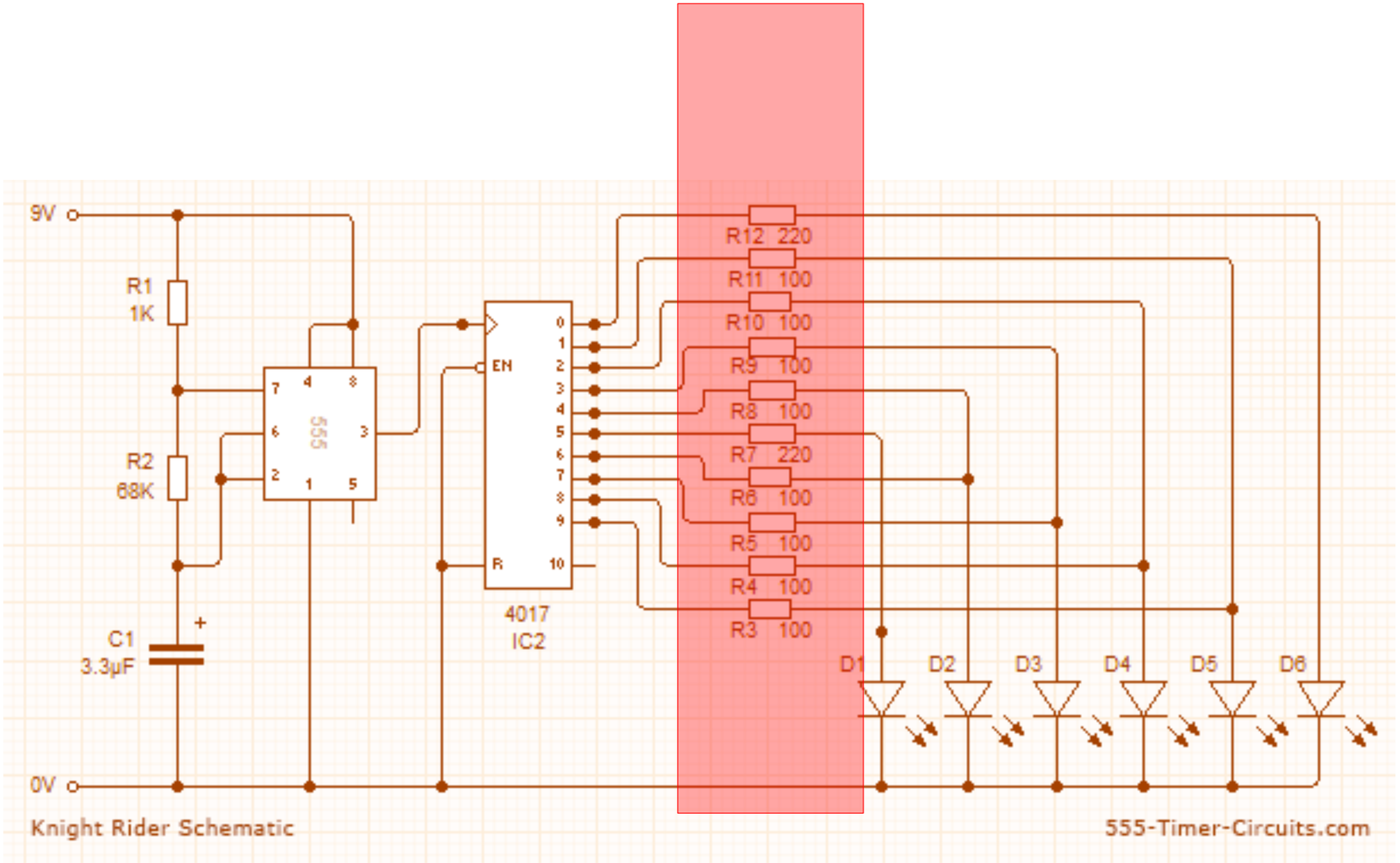
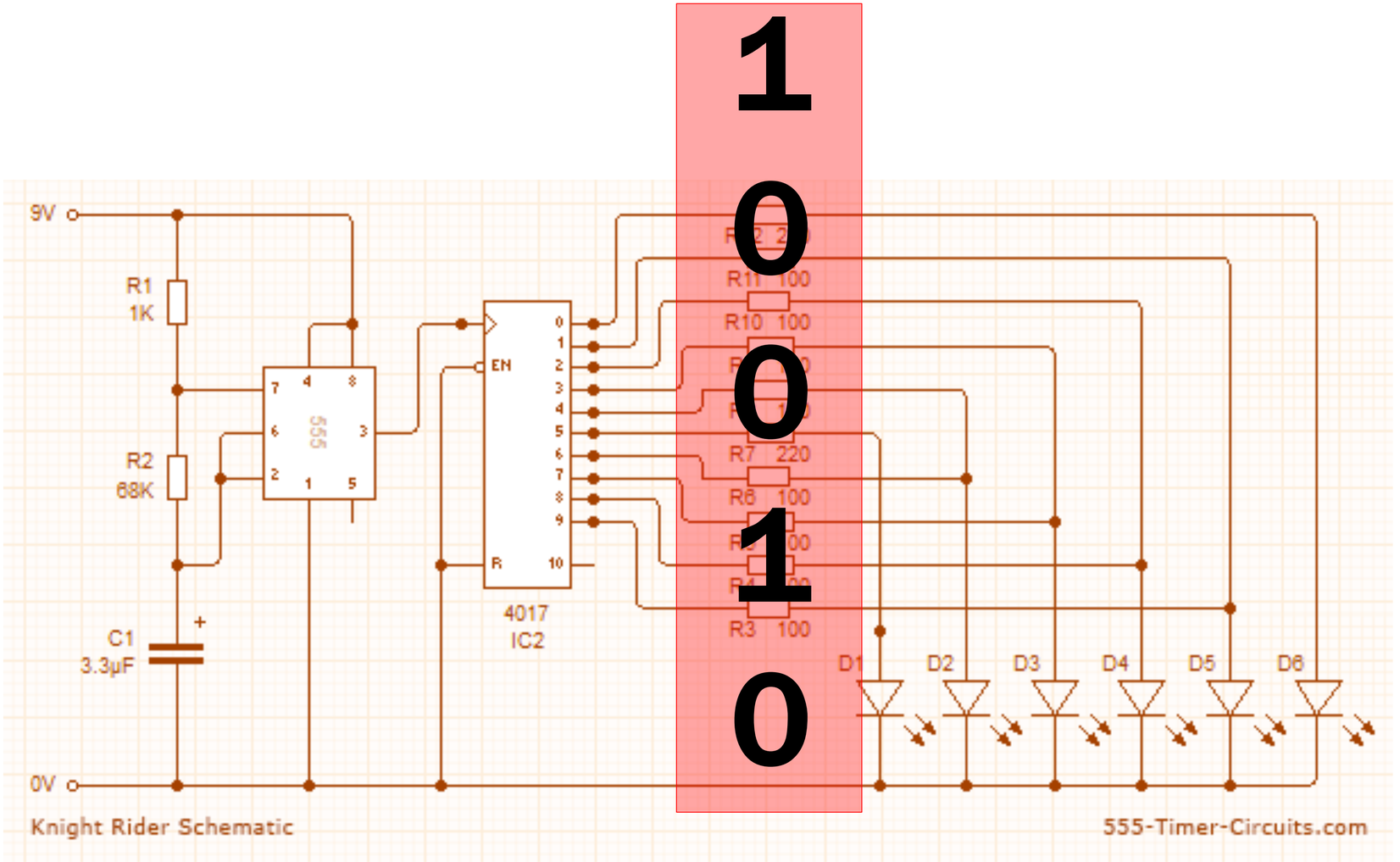


1


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

1

0

0

1

0

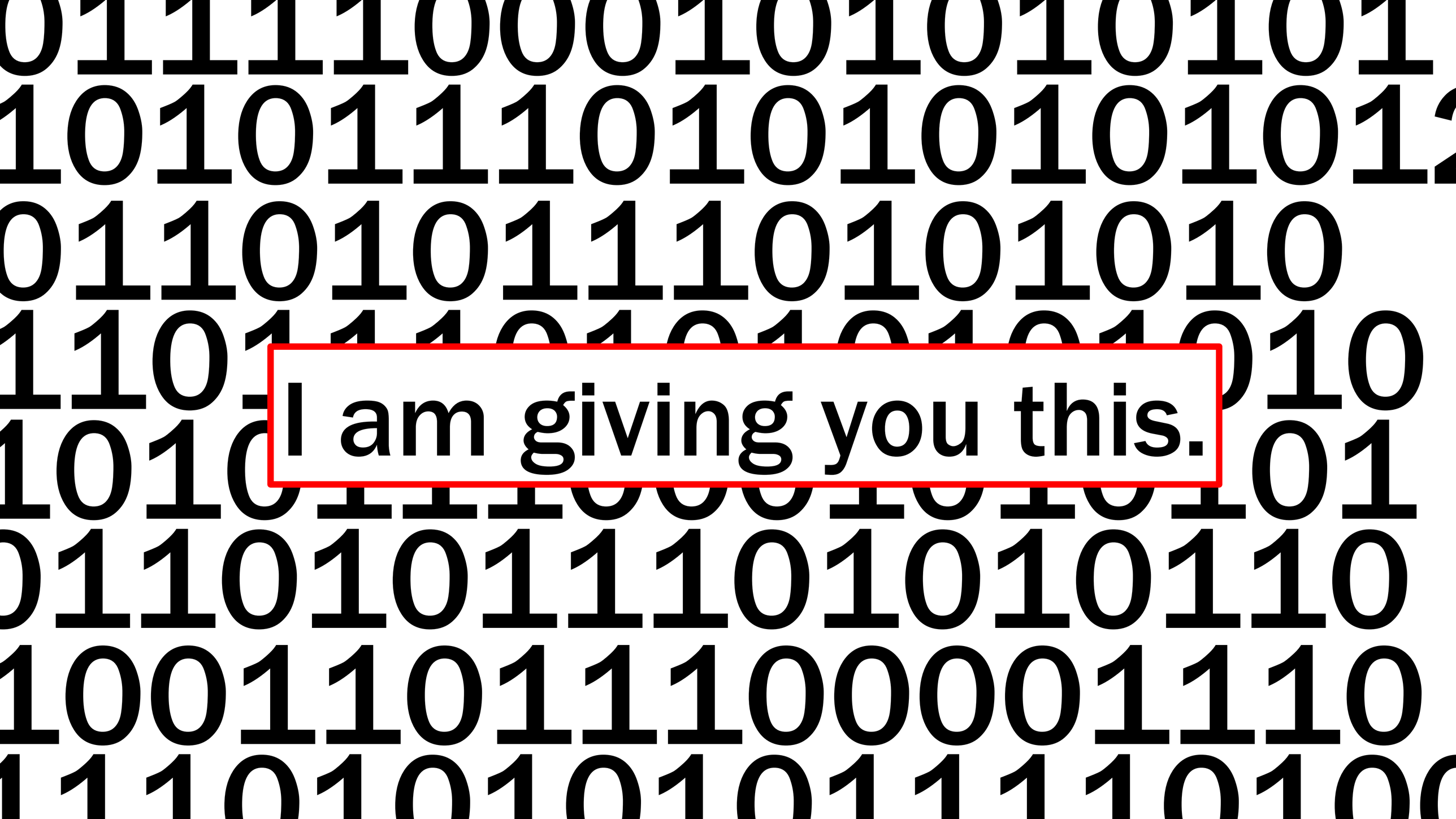
ARE THE DIGITS REALLY THERE?

DIGITS ARE IN THE

EYE OF THE BEHOLDER.

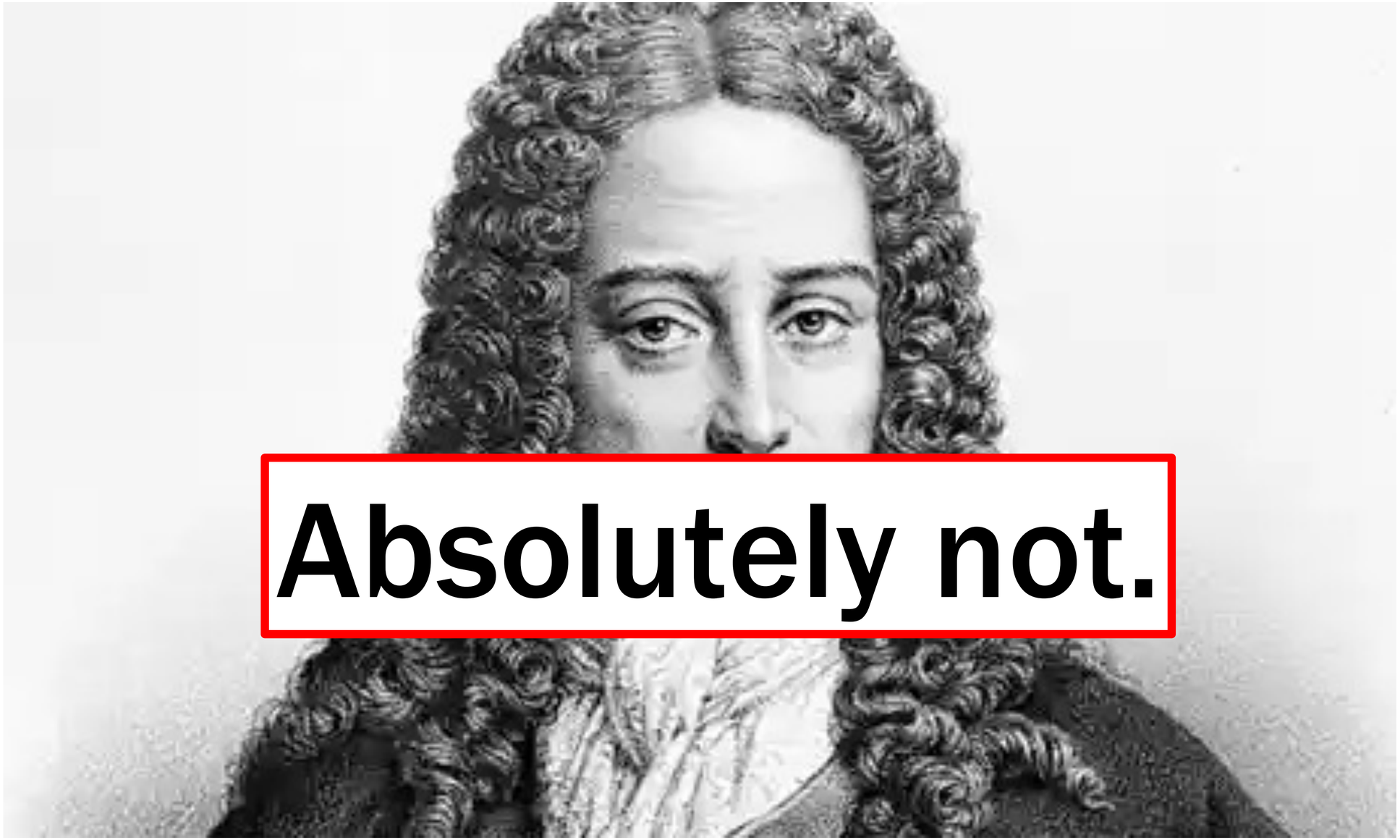
WAIT!


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)

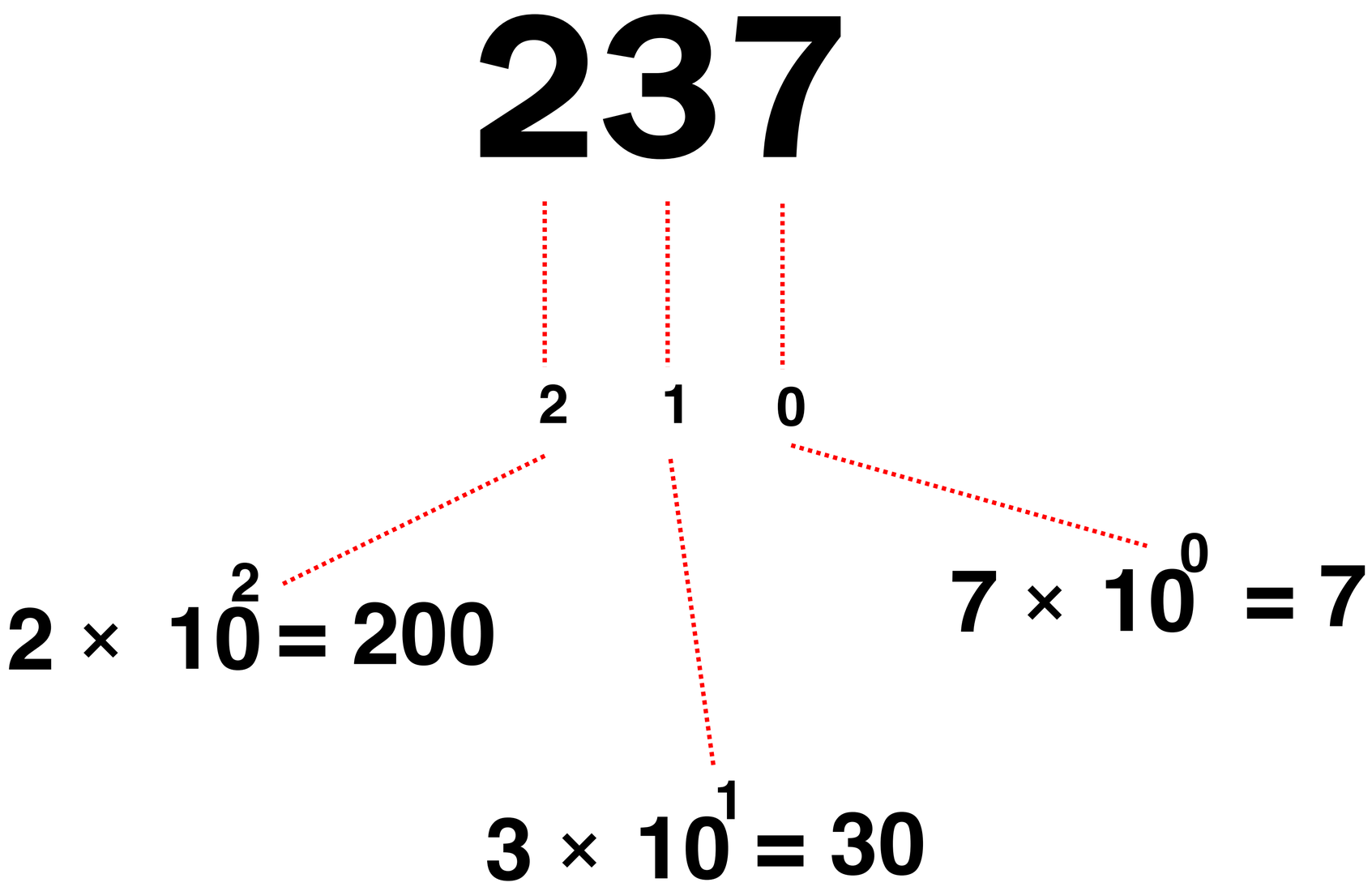
THE BINARY SYSTEM

{0;1}

THE DECIMAL SYSTEM

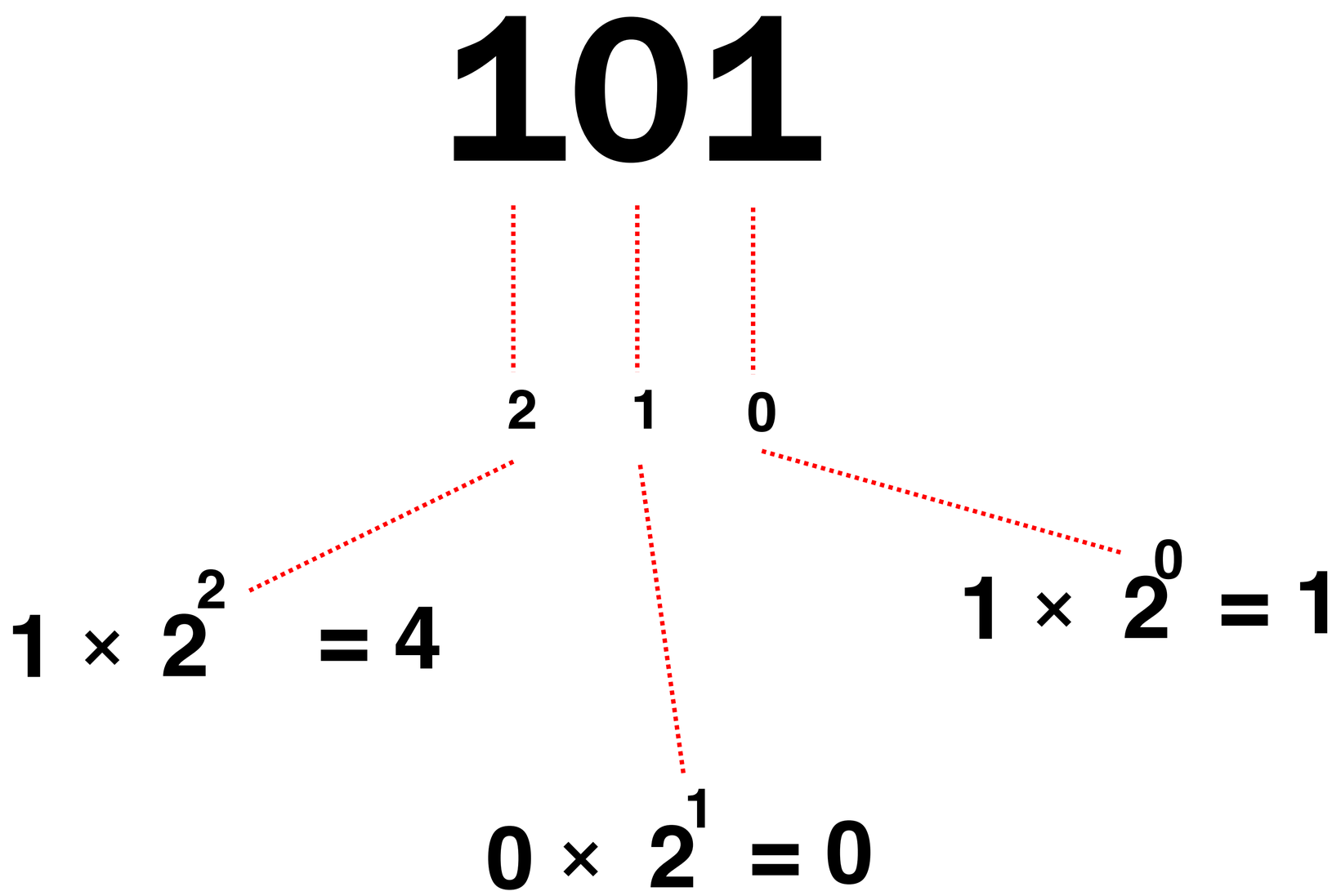
{0;1;2;3;4;5;6;7;8;9}

237


237
2
1
0
$2 \times 10^2 = 200$
$3 \times 10^1 = 30$
$7 \times 10^0 = 7$

THE BINARY SYSTEM

{0;1}

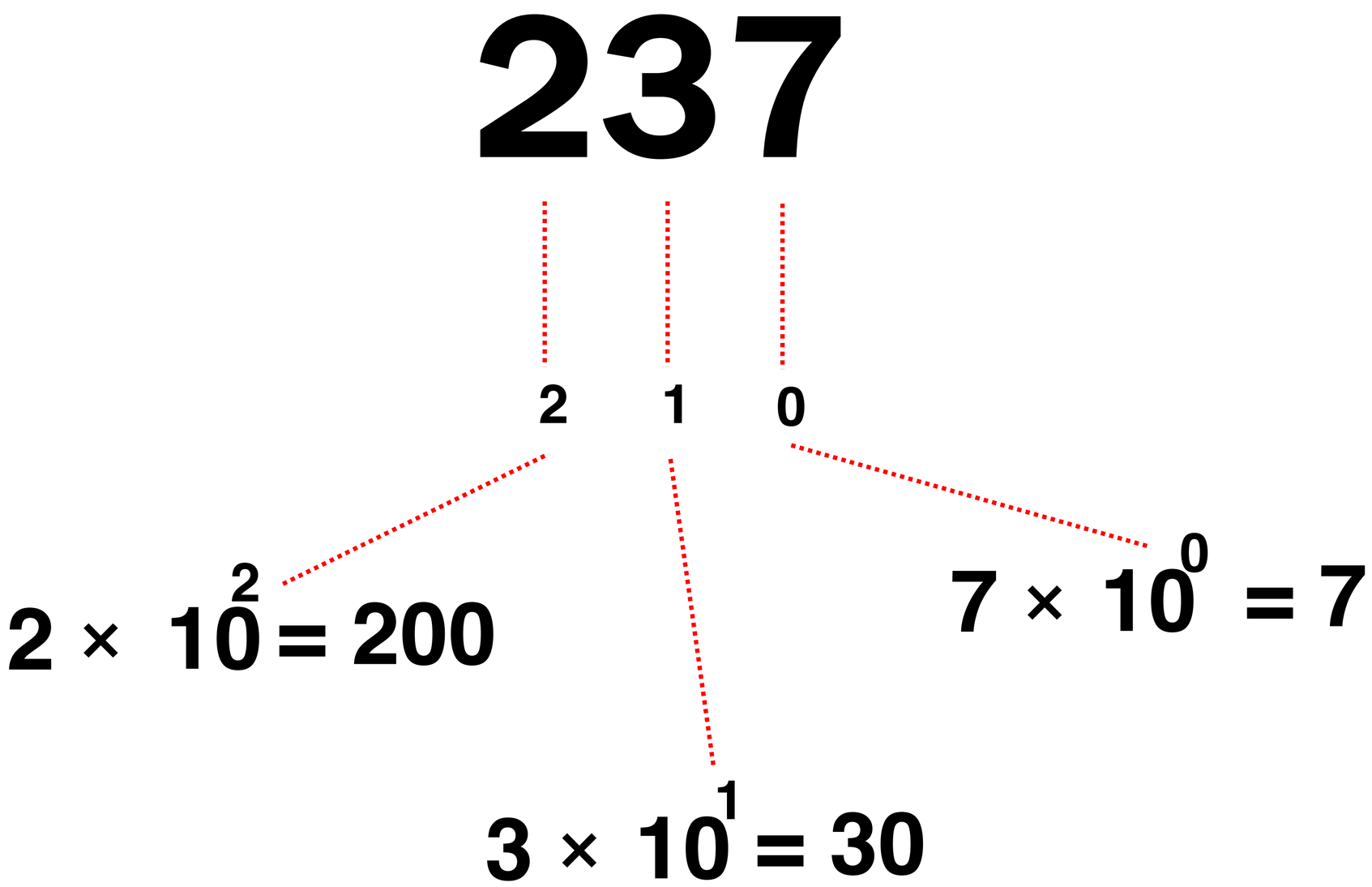

101
2
1
0
1 × 2^2 = 4
0 × 2^1 = 0
1 × 2^0 = 1

101
in binary
encodes
the number 5

$$101_2$$

$$=$$

$$5_{10}$$


237
2
1
0
$2 \times 10^2 = 200$
$3 \times 10^1 = 30$
$7 \times 10^0 = 7$

What is the binary encoding of 237?

$$237 =$$

$$128 + 64 + 32$$

$$+ 8 + 4 + 1$$

(look for powers of 2)

$$237 =$$

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

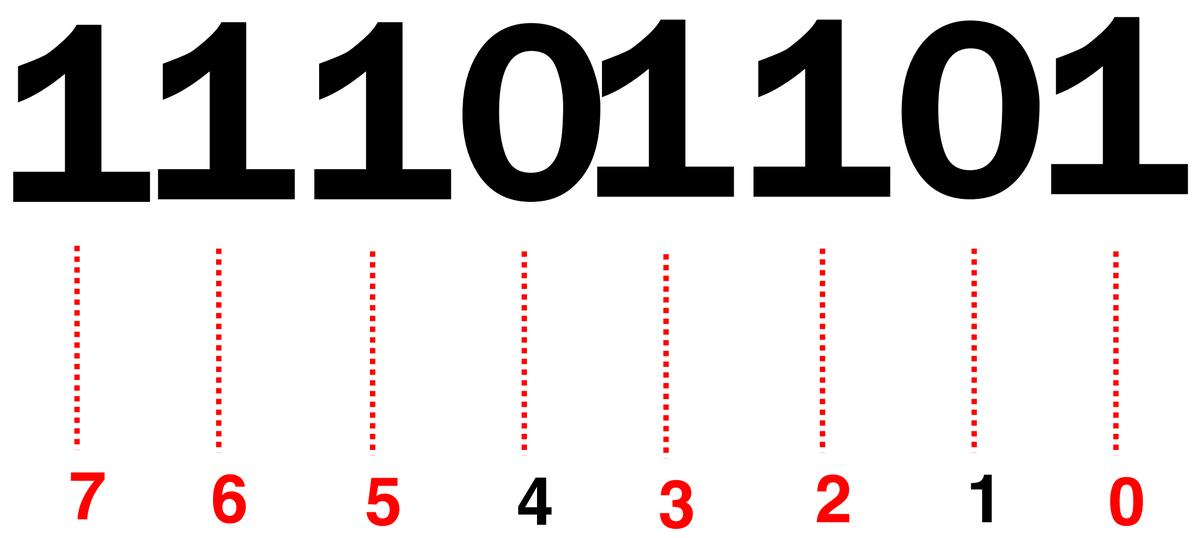
$$+ 2^3 + 2^2 + 2^0$$

$$237 =$$

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

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

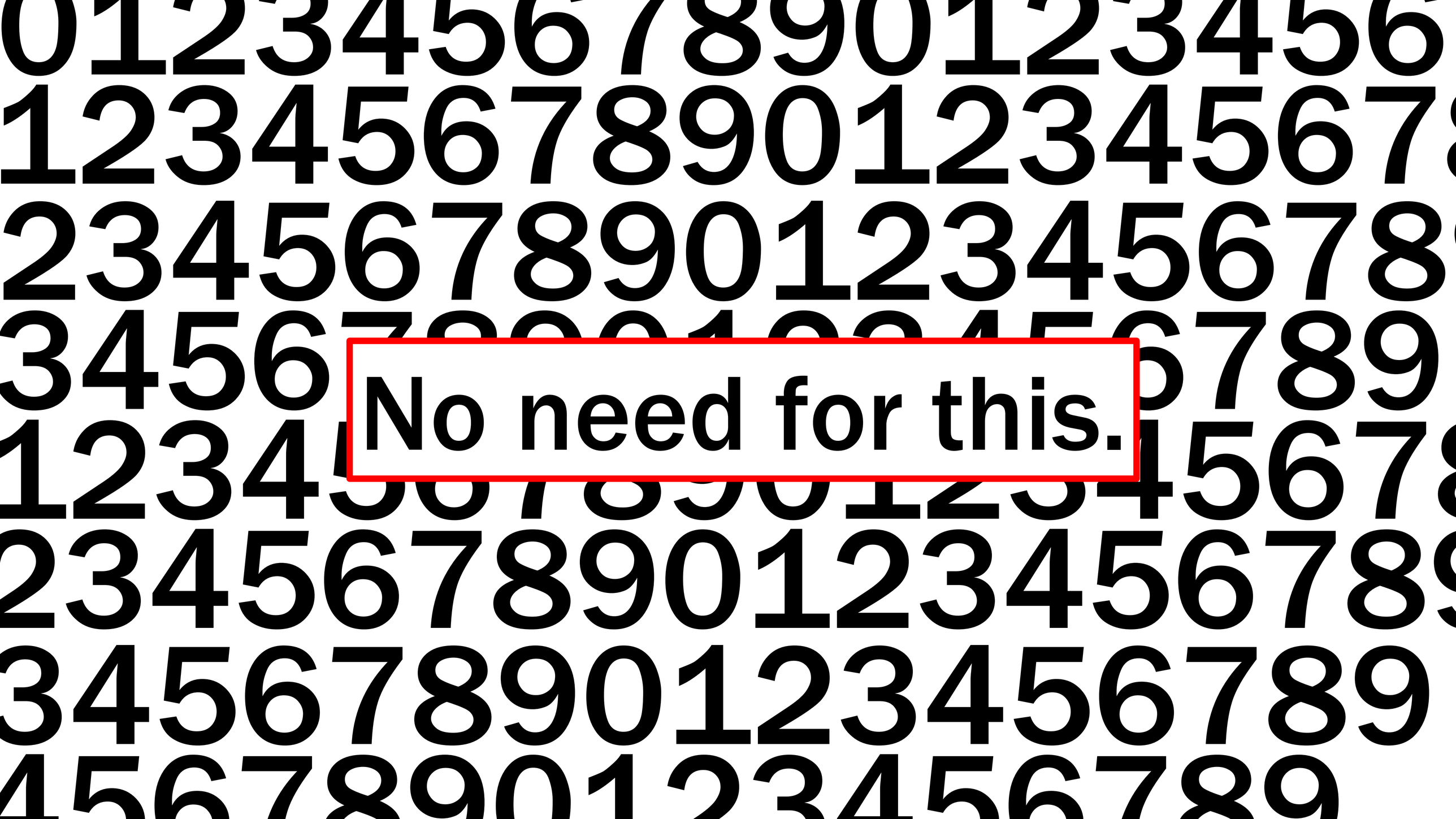
(put a 1 in the positions
indicated by the exponents,
0 in the other positions)

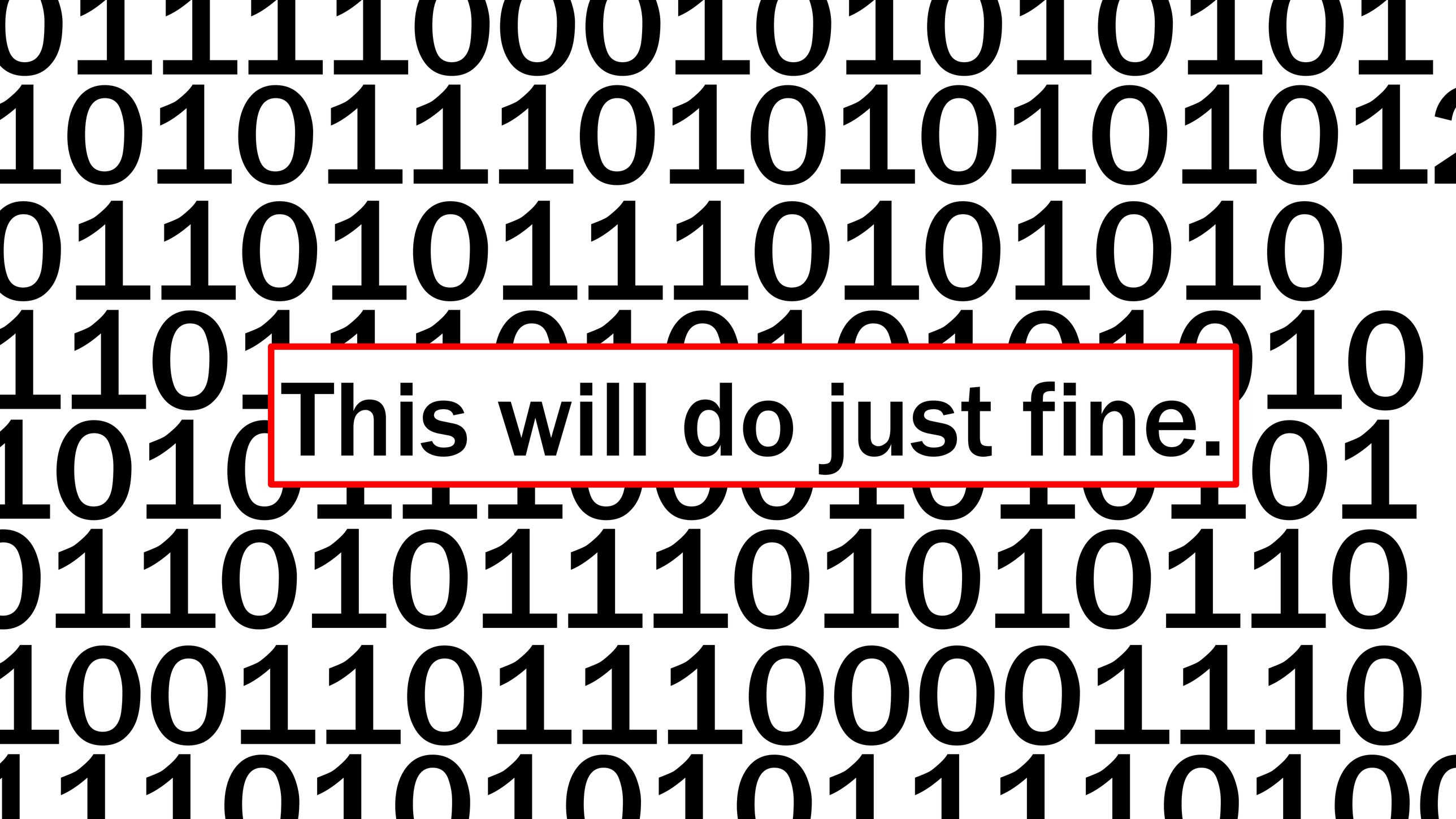

11101101
7 6 5 4 3 2 1 0

$$11101101_2$$

$$=$$

$$237_{10}$$


No need for this.


This will do just fine.

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