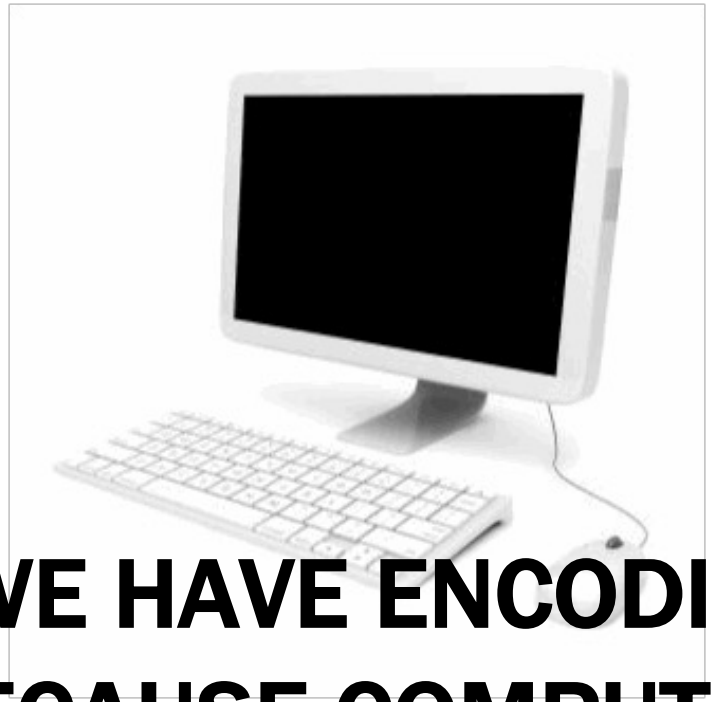
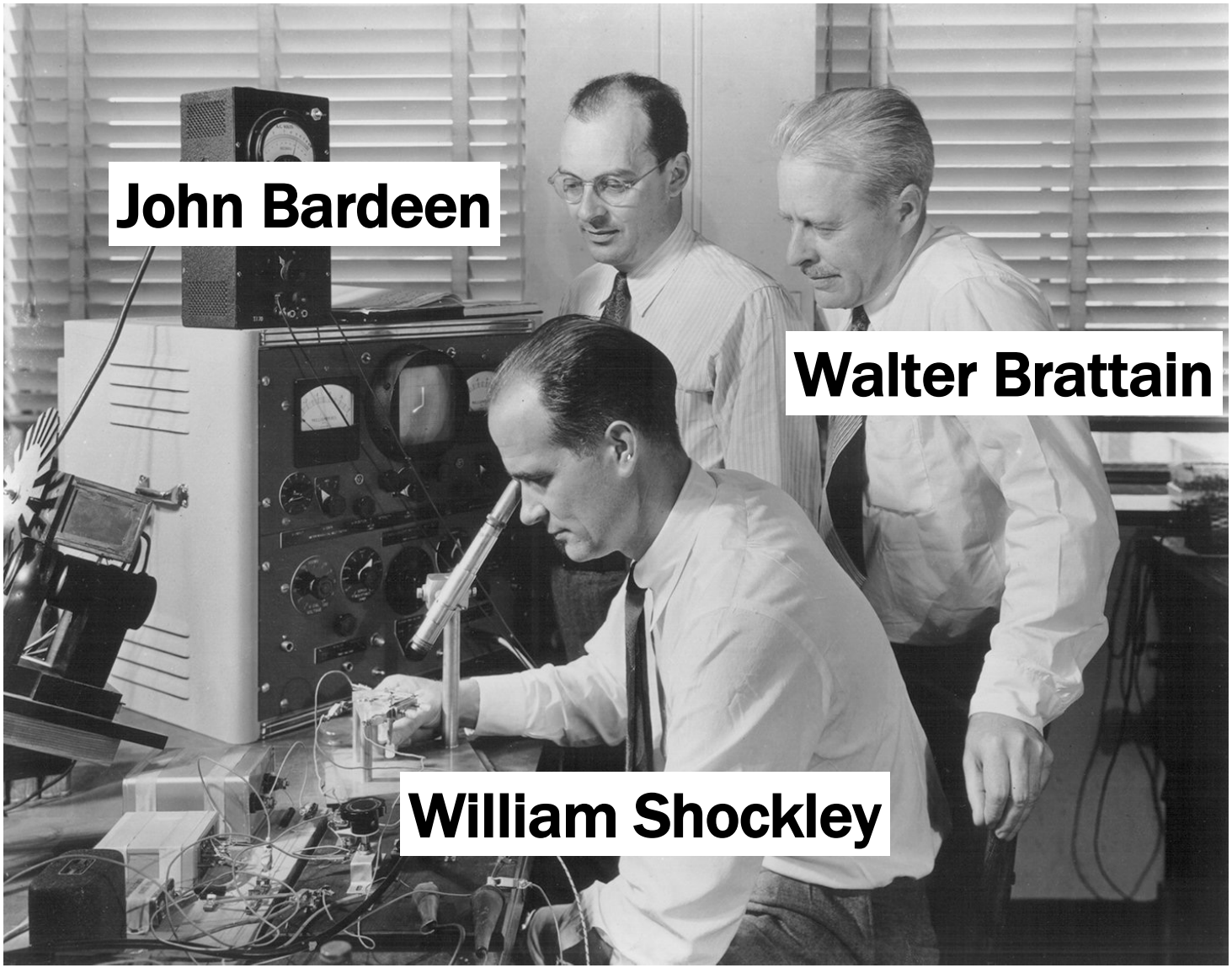
Digital Humanities
Lecture 3
March 6
2026
Mario Verdicchio

WE HAVE ENCODING BECAUSE COMPUTERS ARE DIGITAL



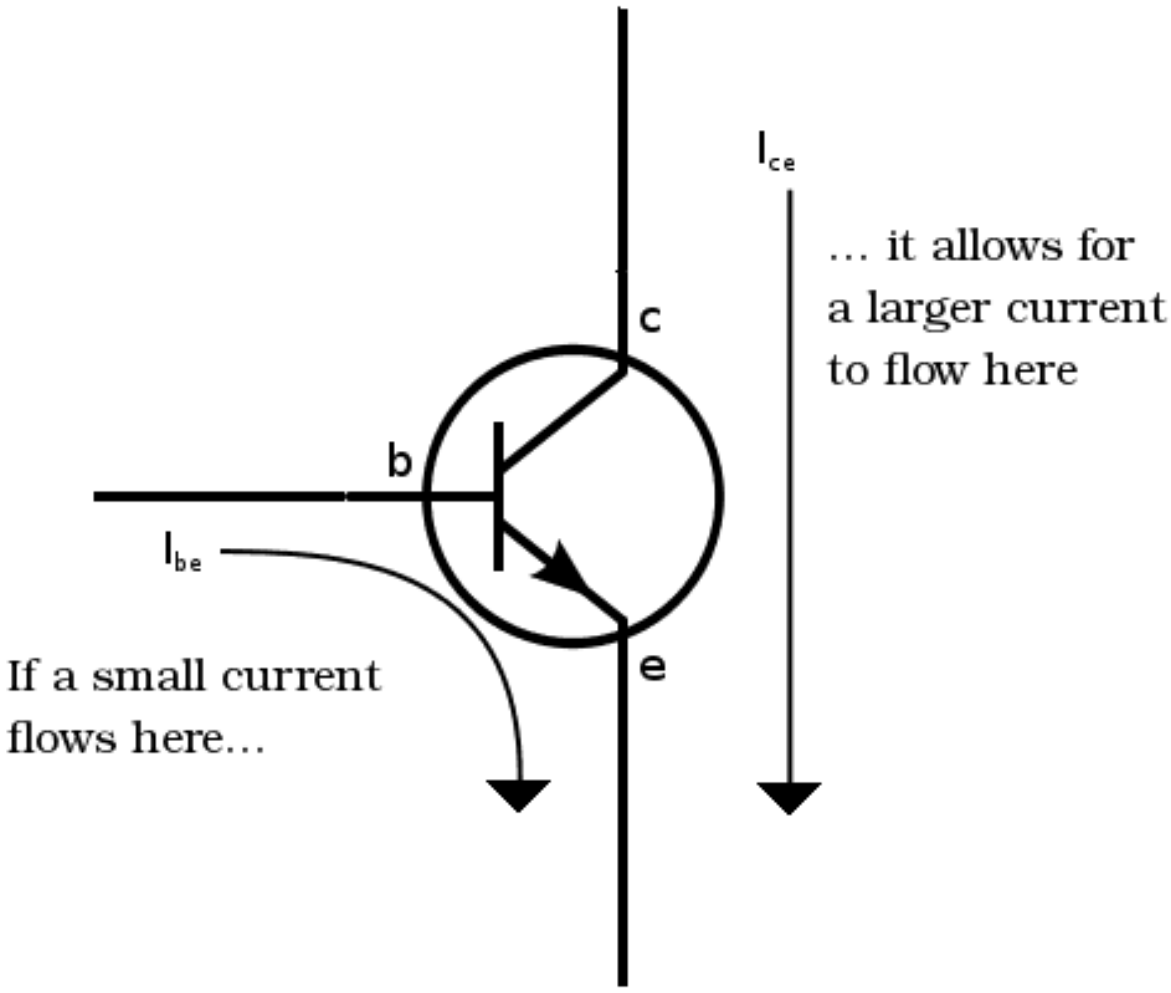
WE HAVE ENCODING
BECAUSE COMPUTERS
HAPPEN TO BE DIGITAL

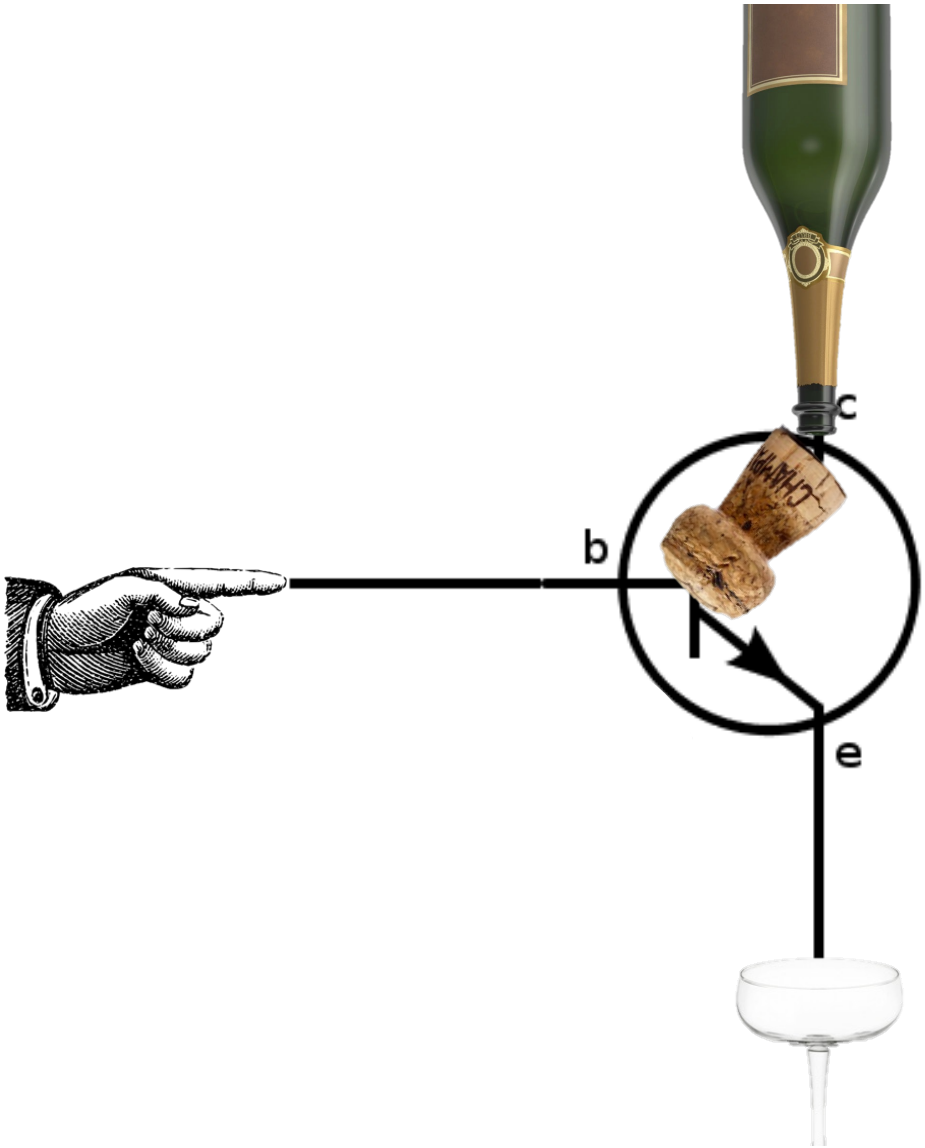

John Bardeen
Walter Brattain
William Shockley

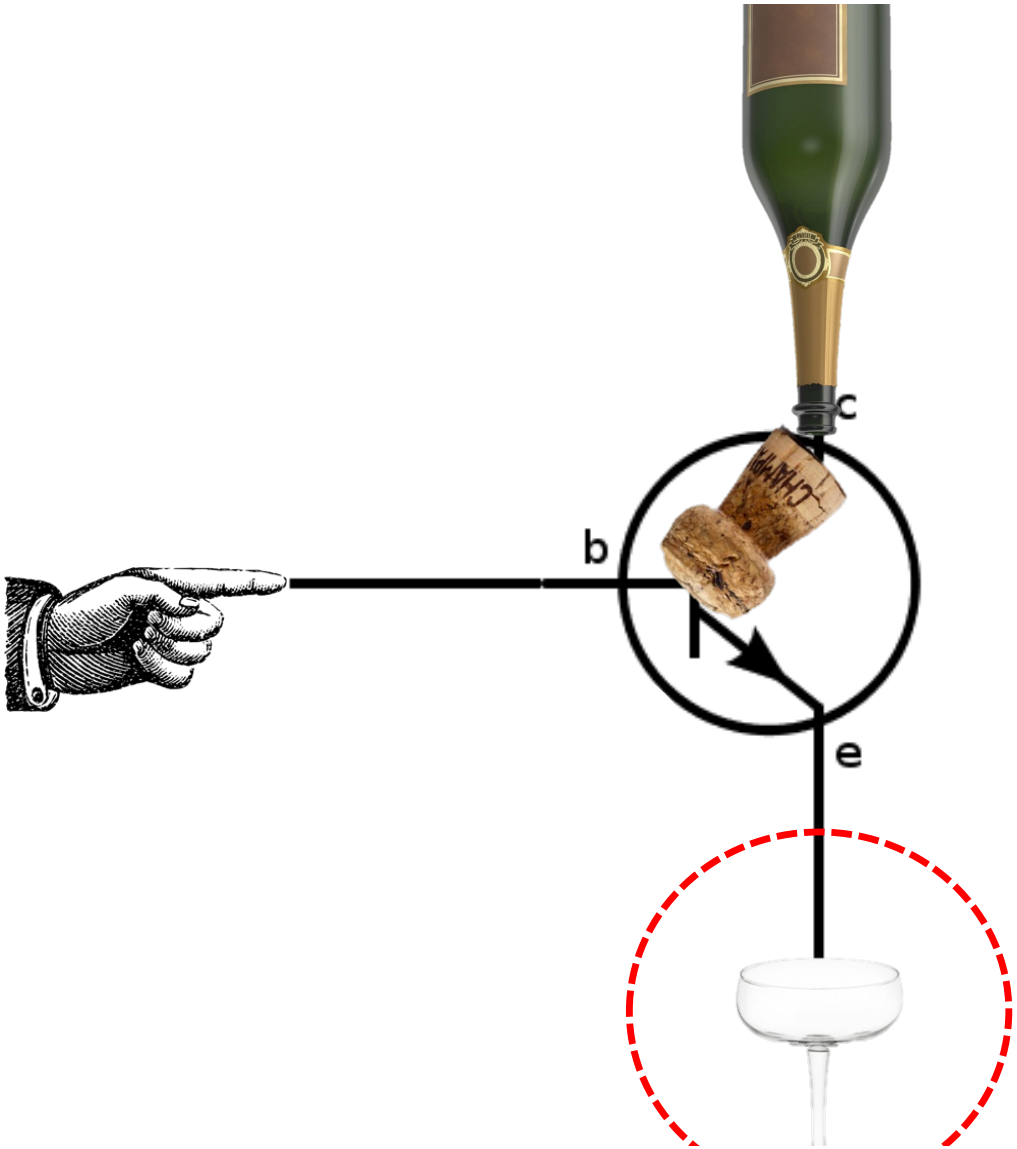
THEY INVENTED THE TRANSISTOR

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
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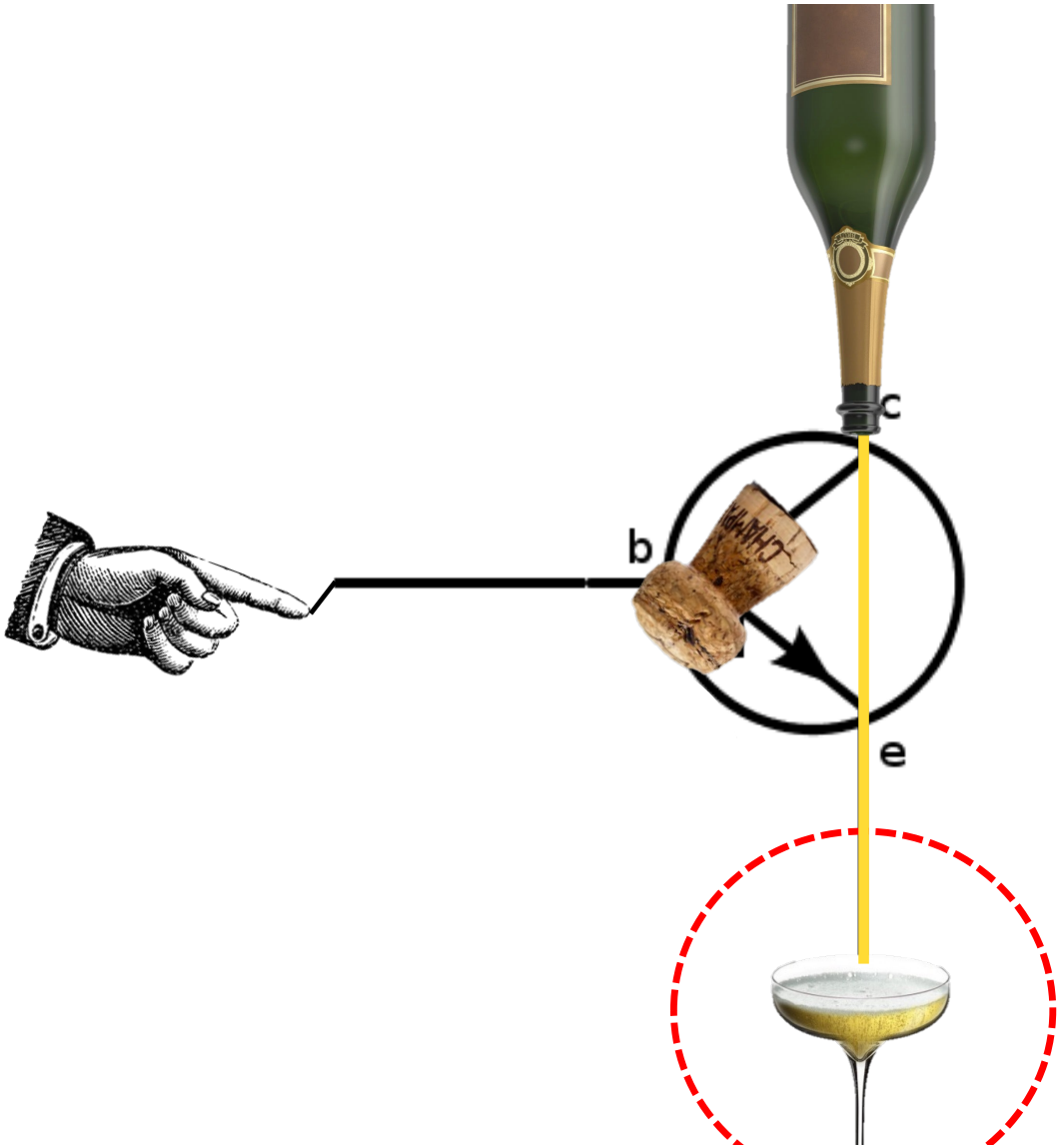
c
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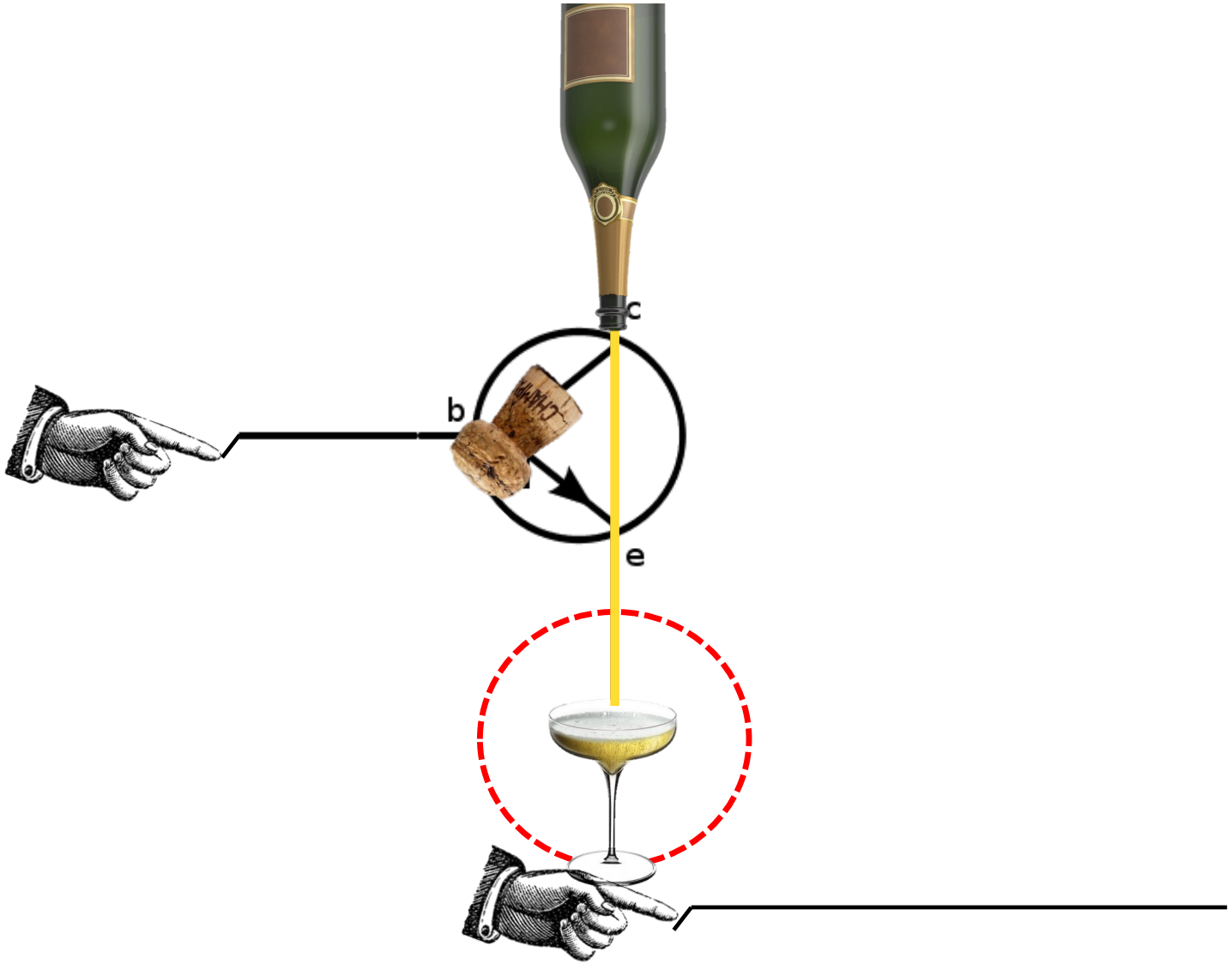
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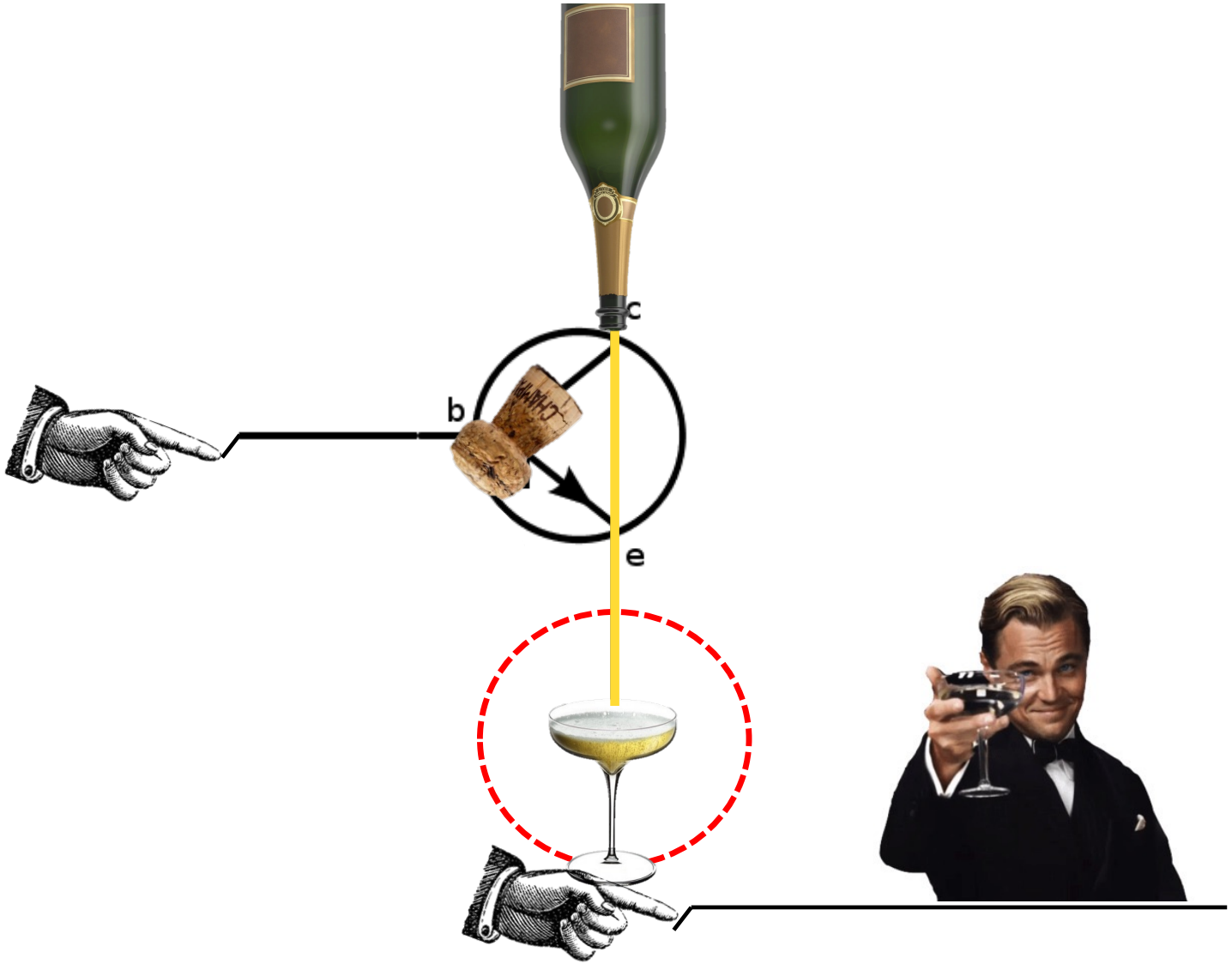
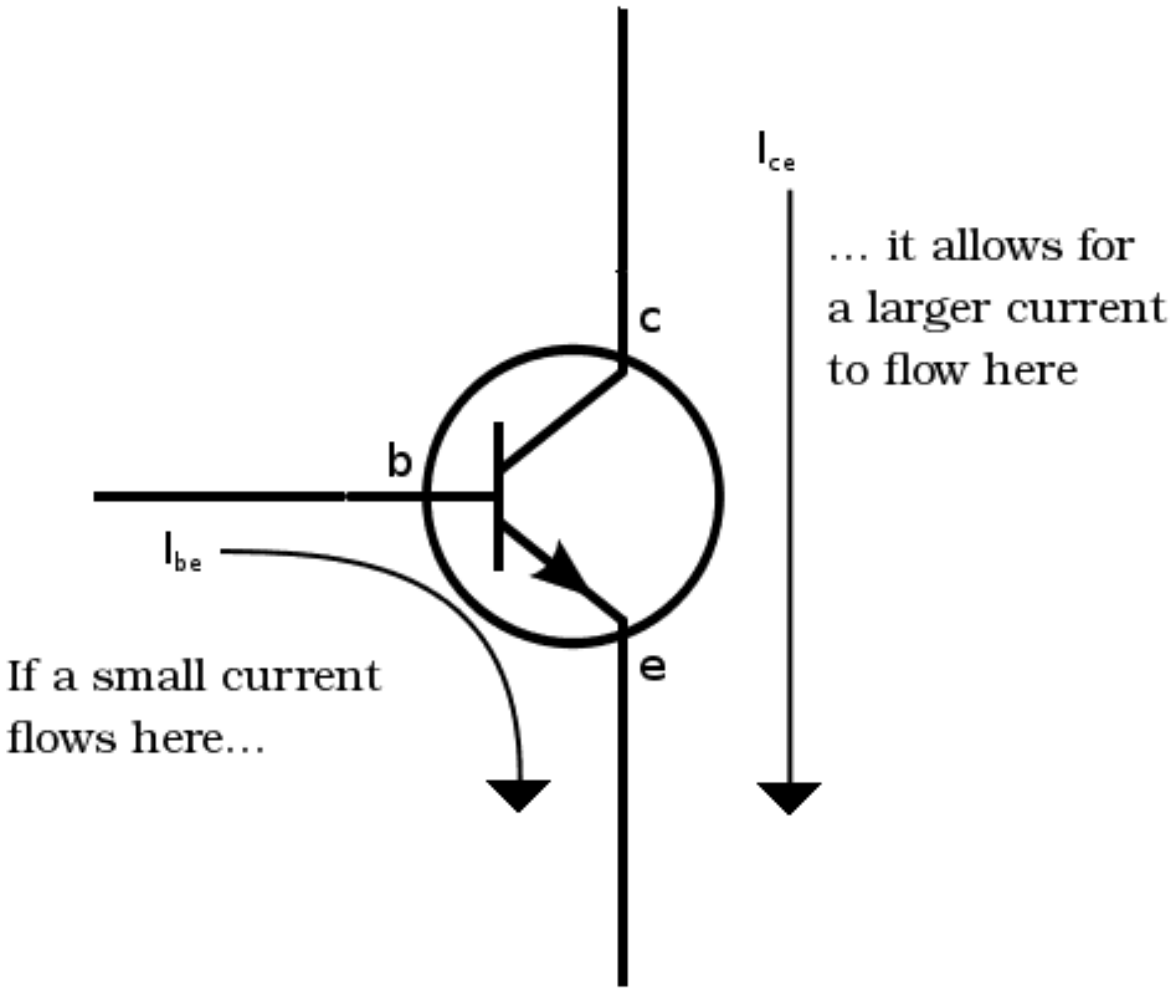

c
b
e


I_{ce}
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b
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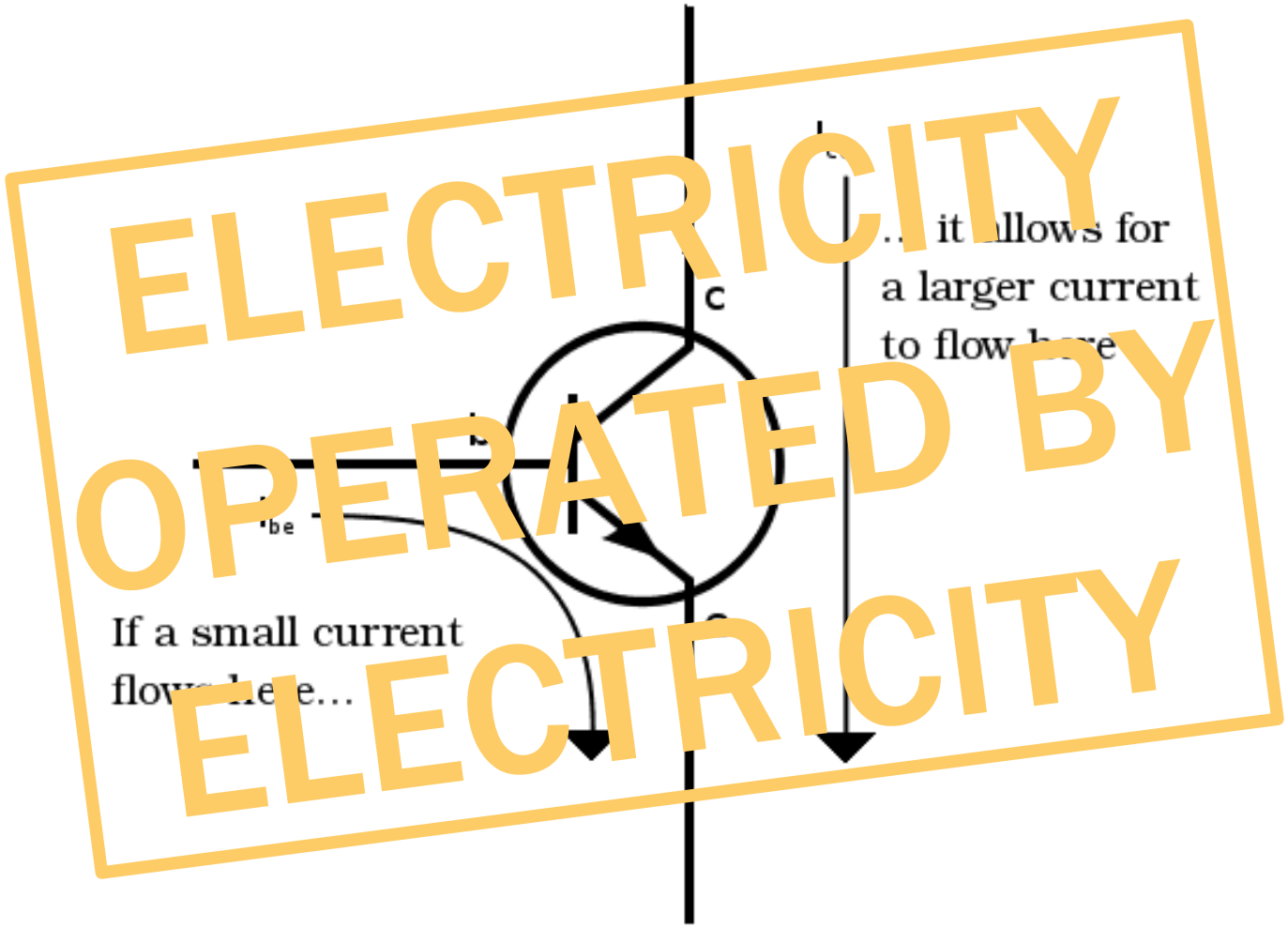


ELECTRICITY
OPERATED BY
ELECTRICITY

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

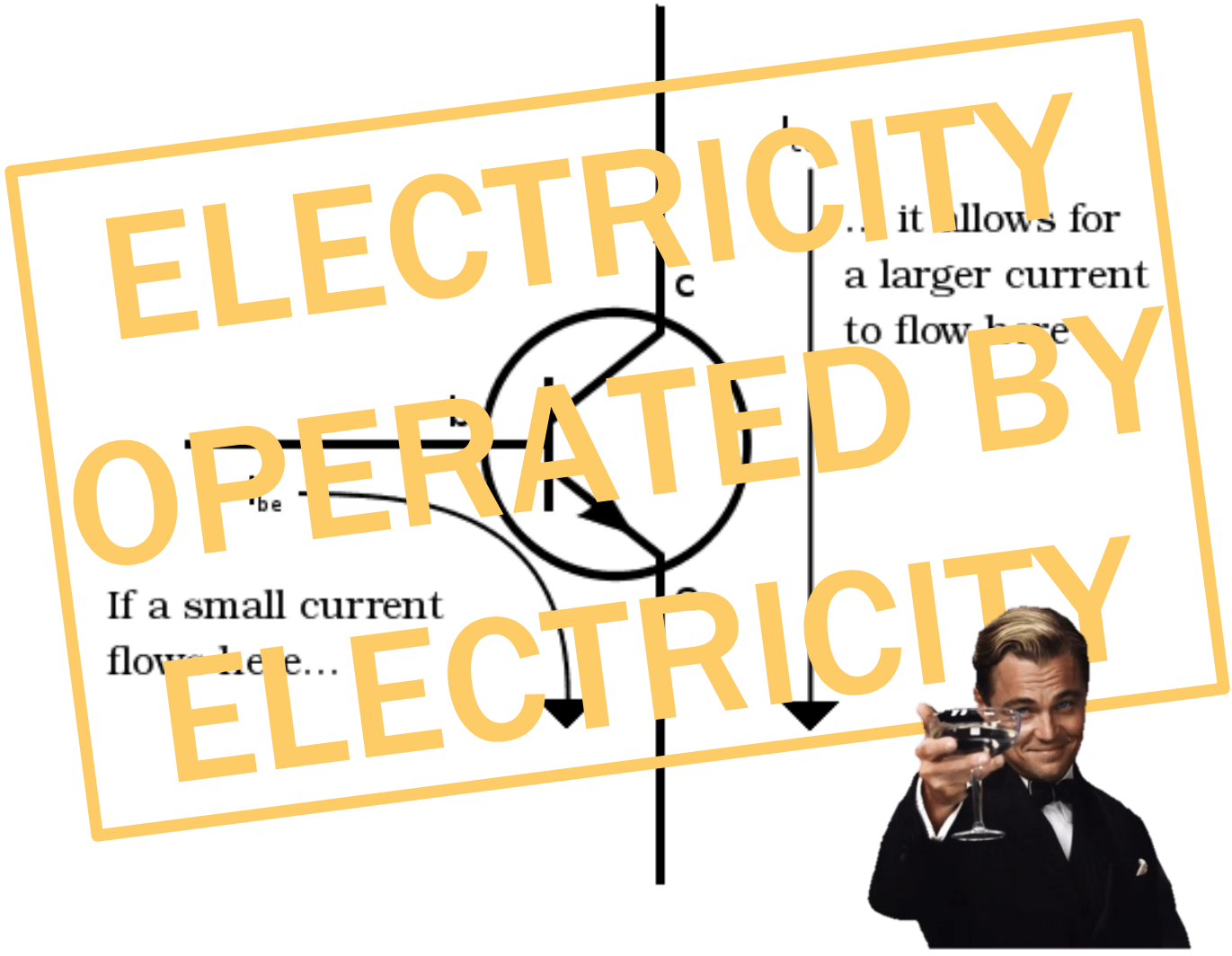
BOO
MECHANICS
BOOOO!

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
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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
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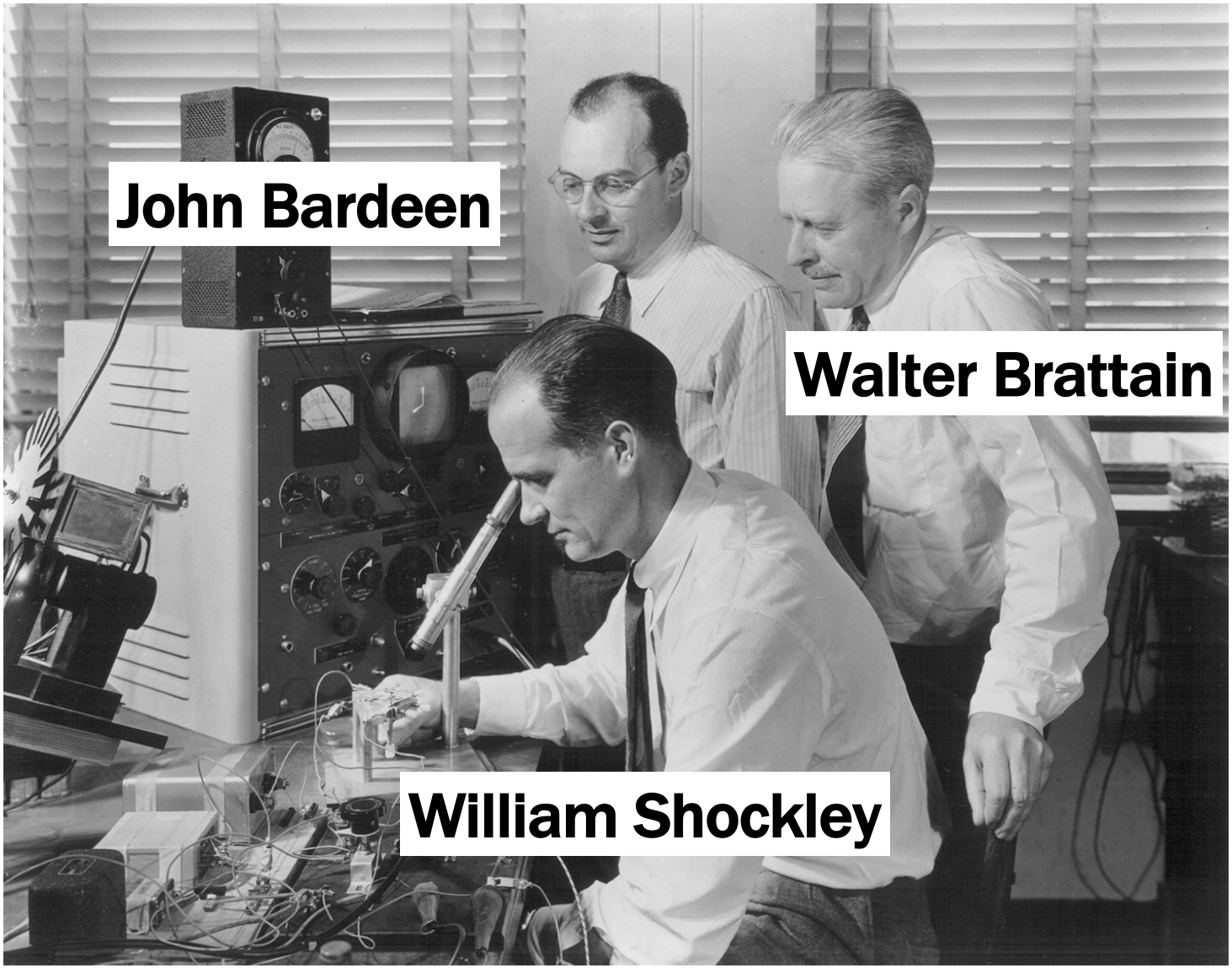
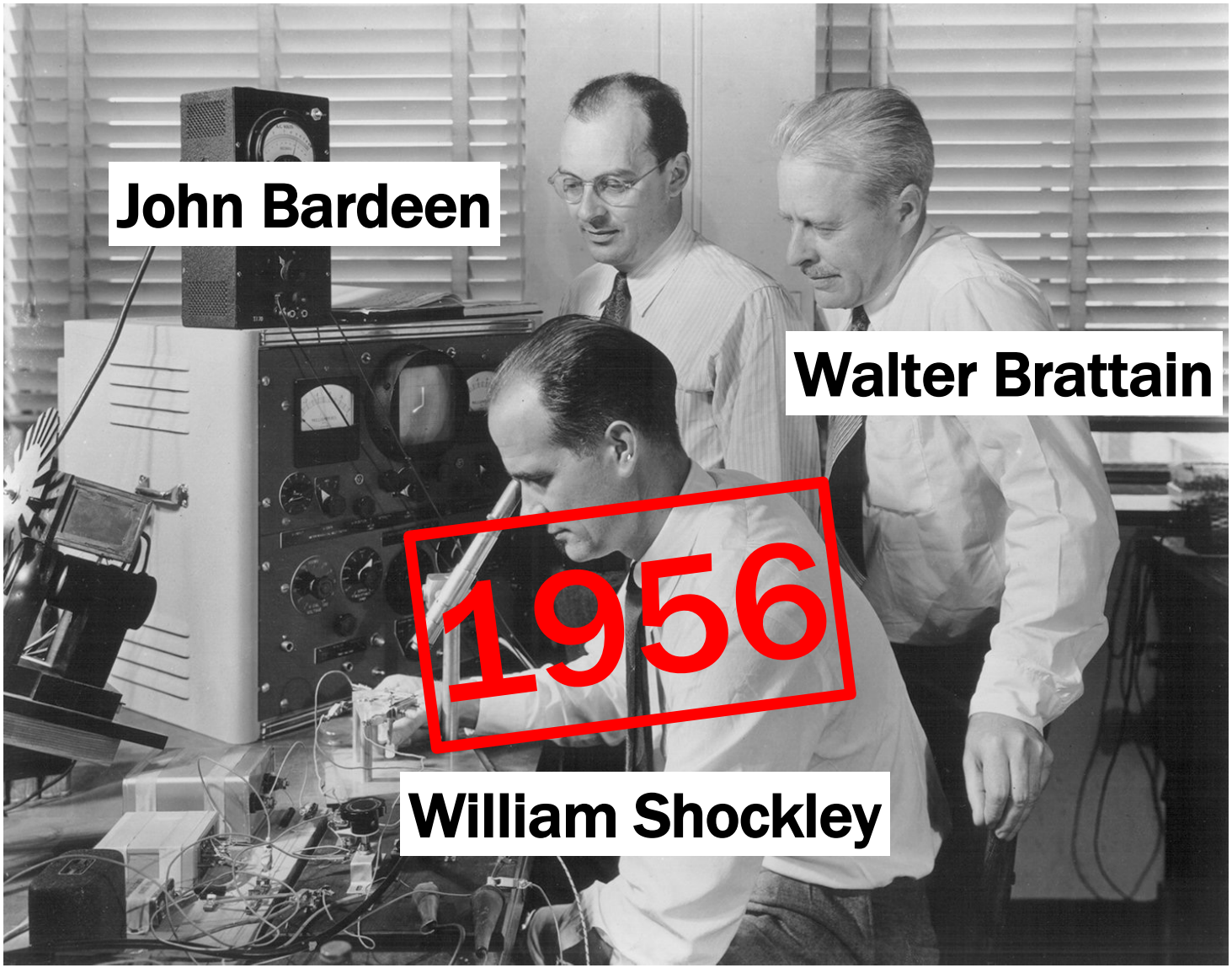
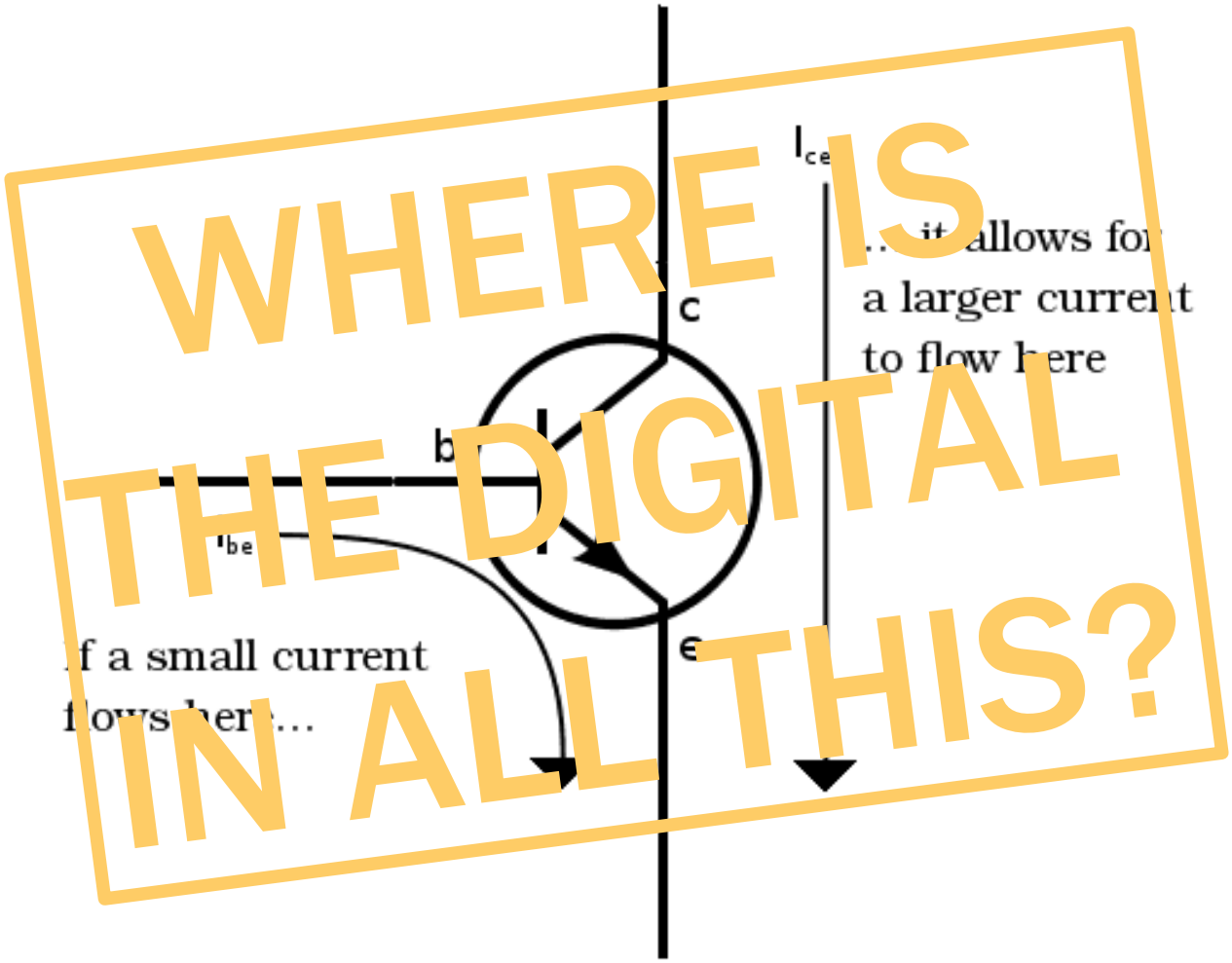

John Bardeen
Walter Brattain
William Shockley


John Bardeen
Walter Brattain
1956
William Shockley

WAIT!

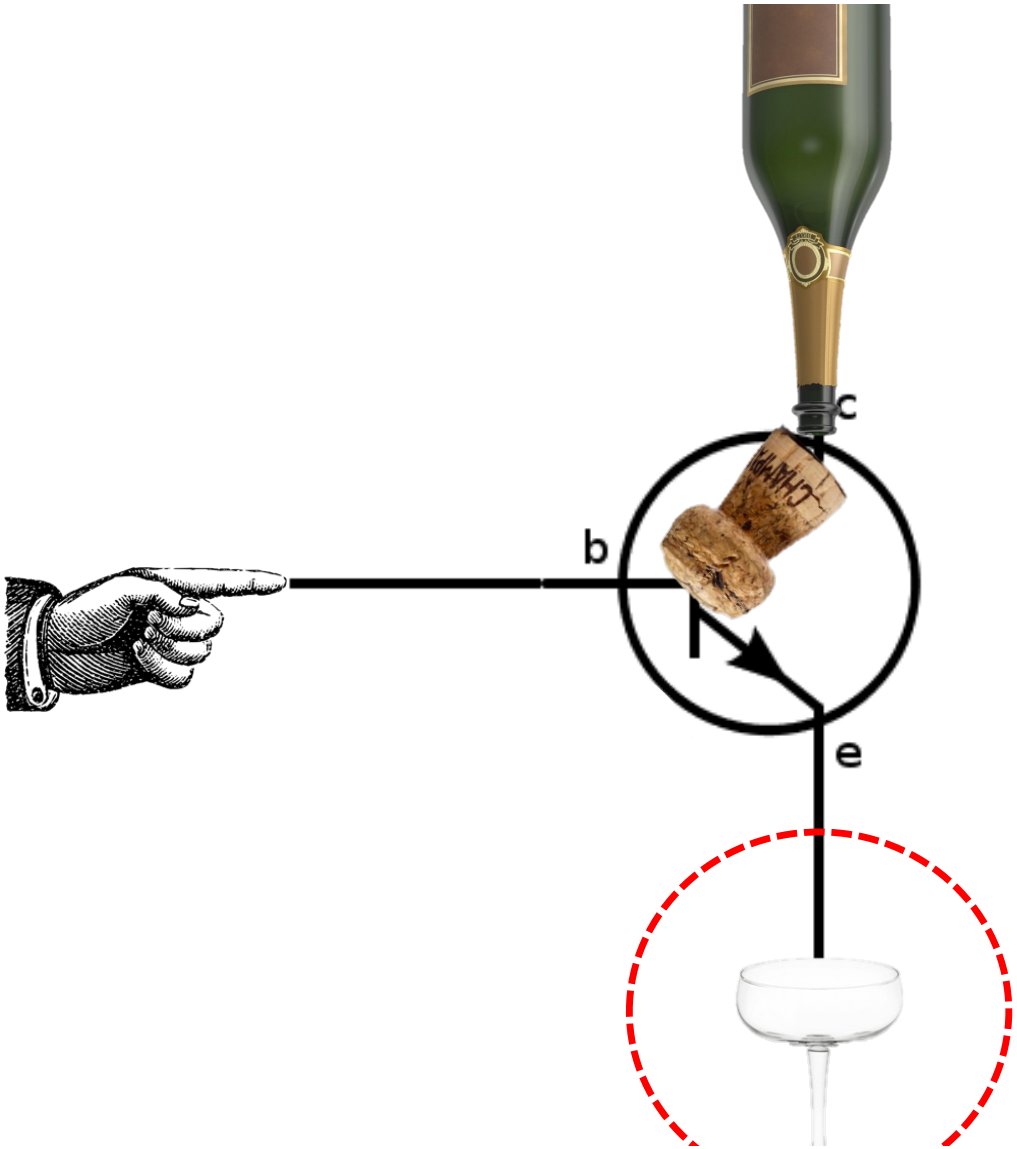

WHERE IS
THE DIGITAL
IN ALL THIS?
I_{ce}
... it allows for
a larger current
to flow here
c
b
I_{be}
e
f a small current
flows her...

THE MOST FUNDAMENTAL ENCODING OF THEM ALL*

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

0

1


c
b
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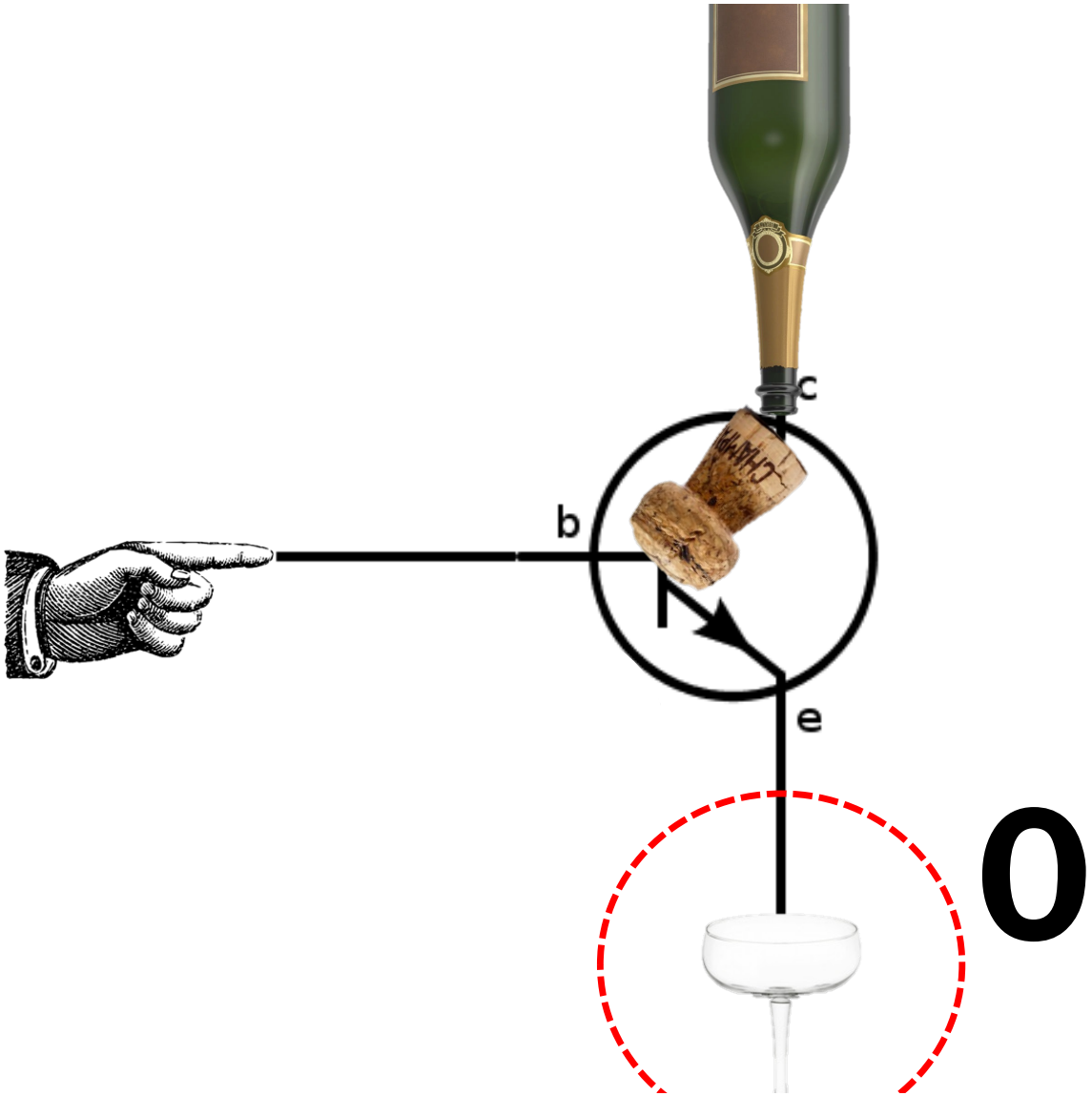
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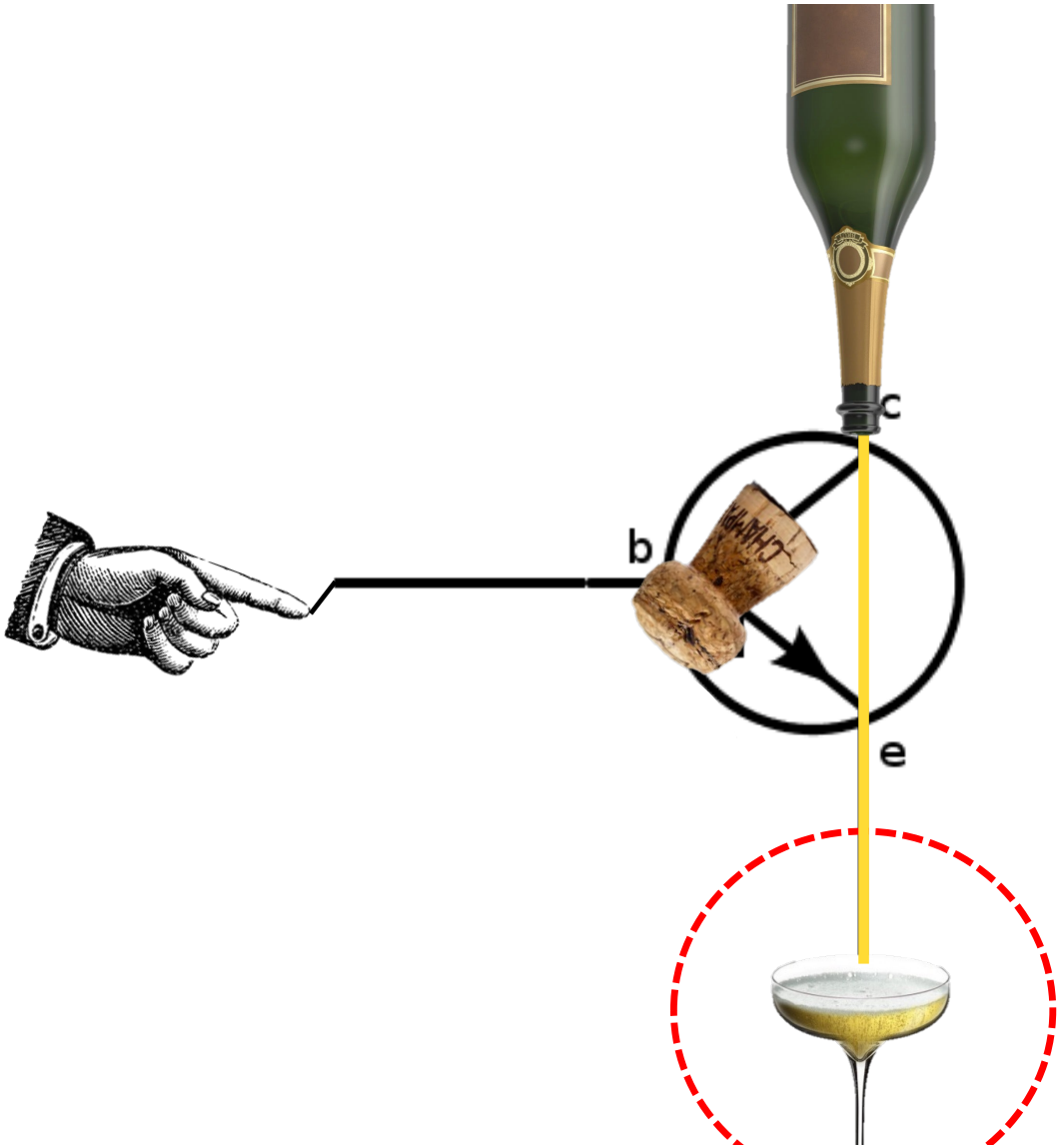
c
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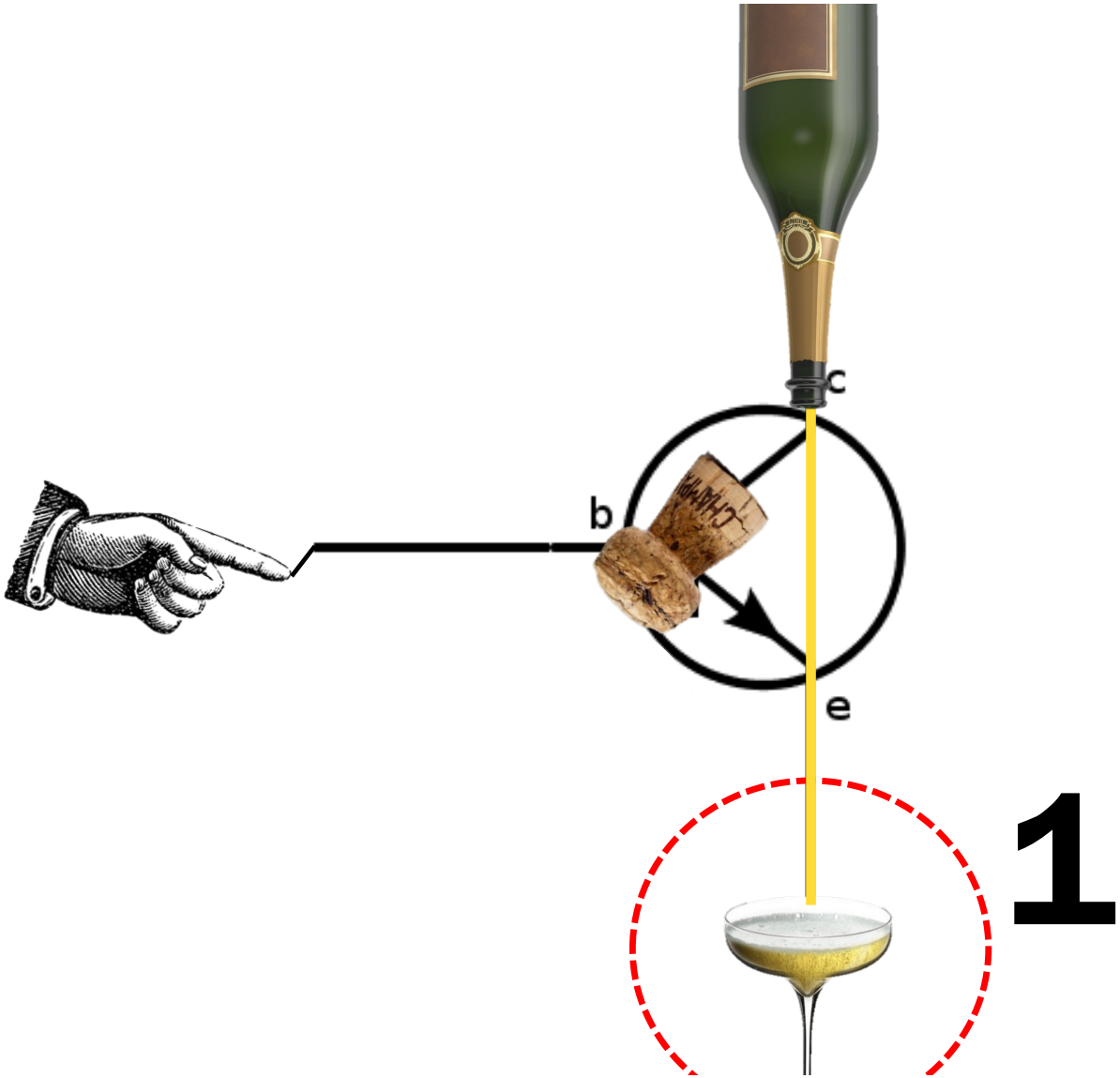
c
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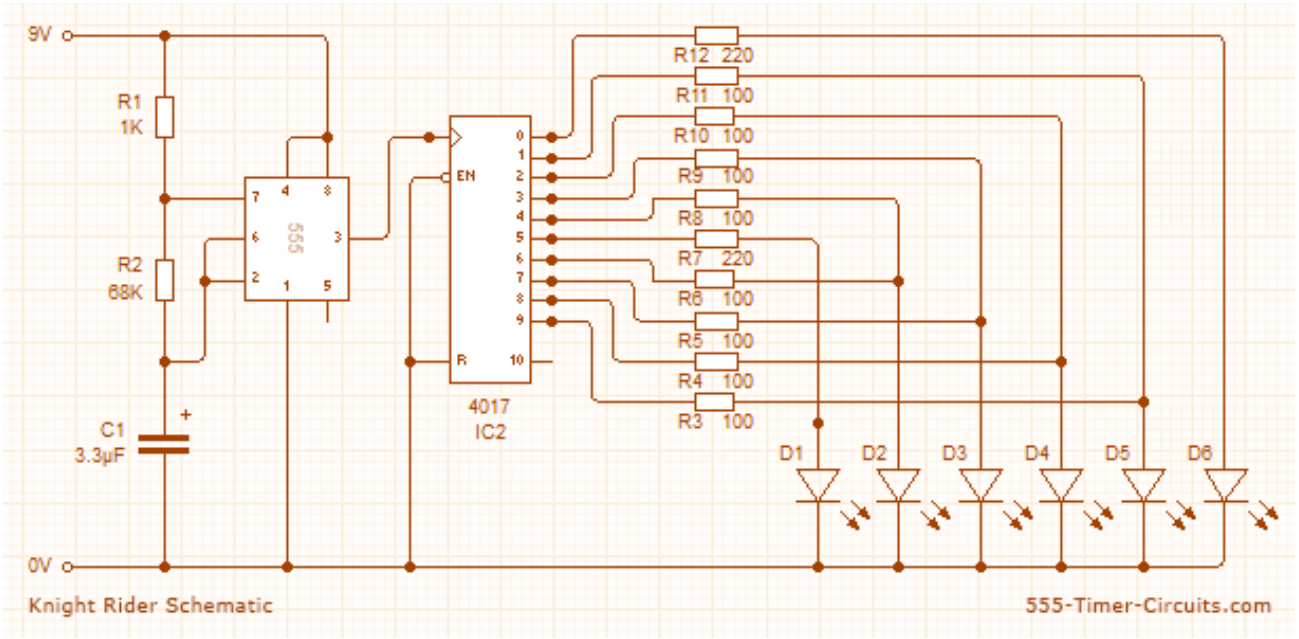
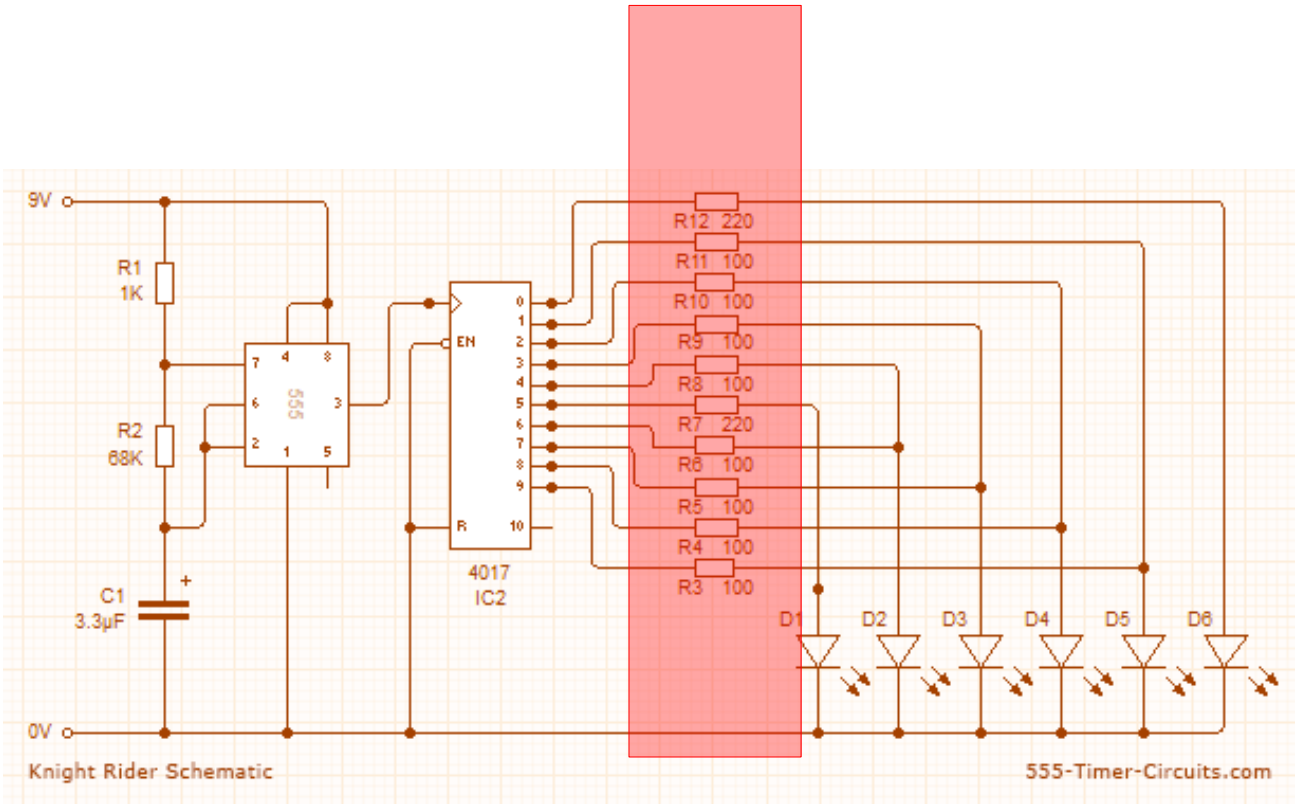
1


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
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D2
D3
D4
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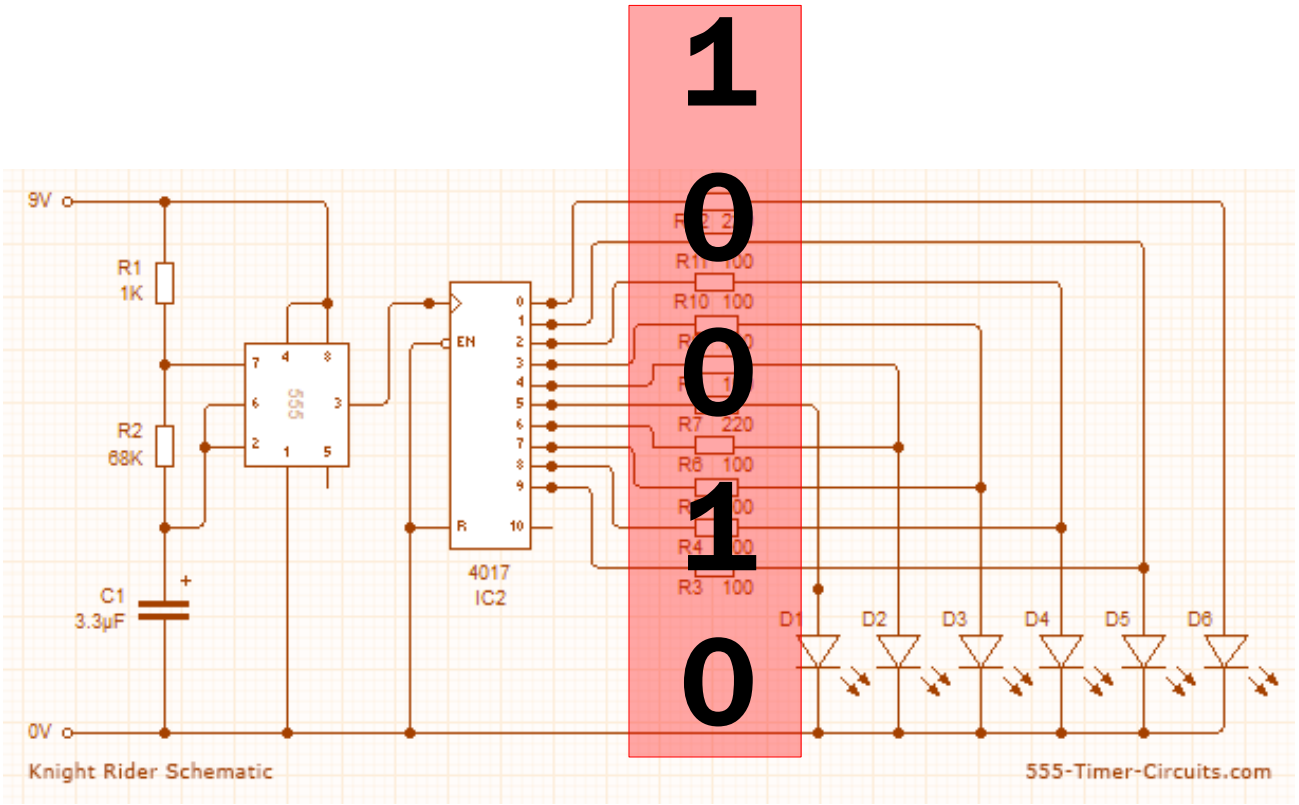
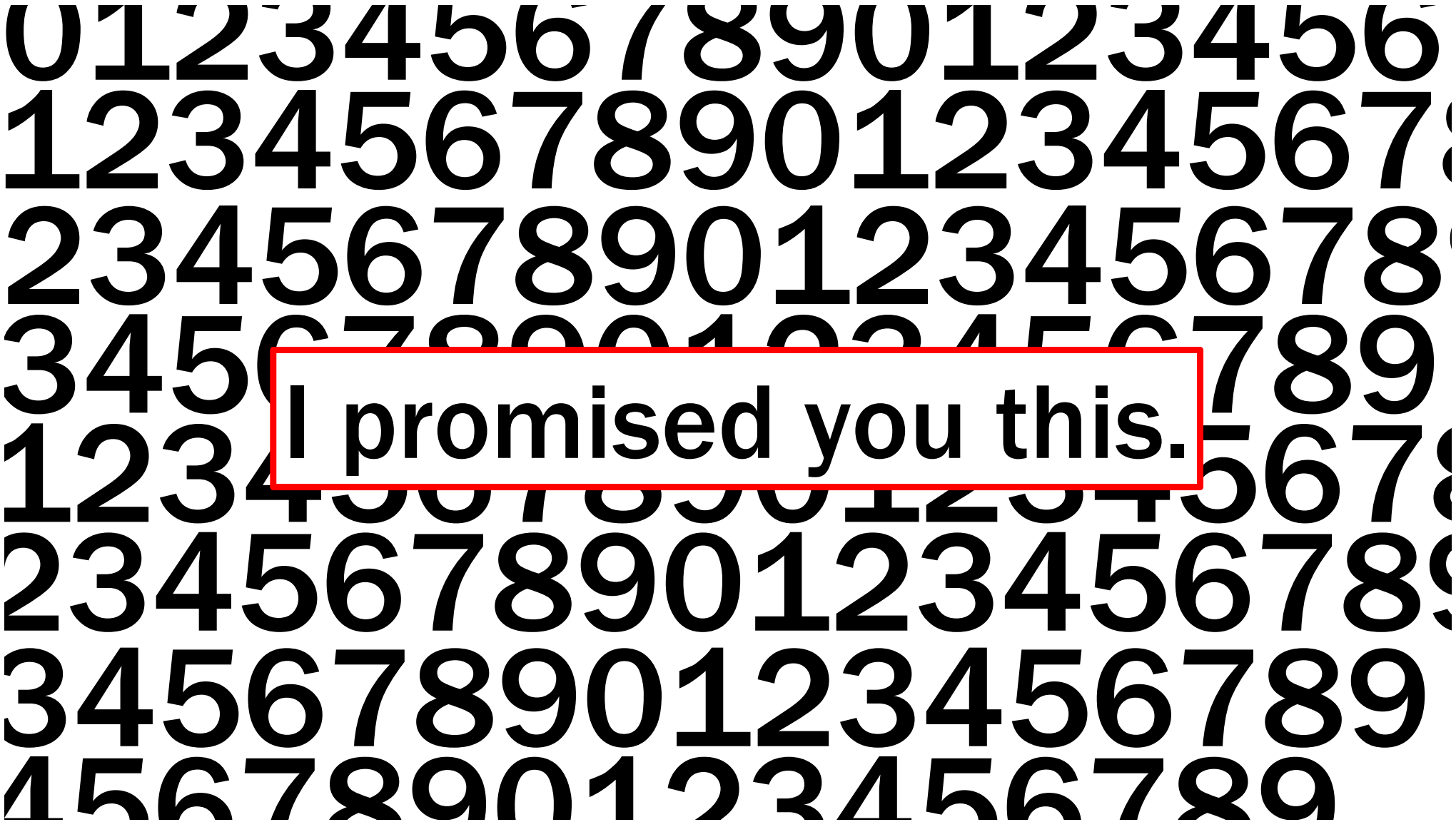
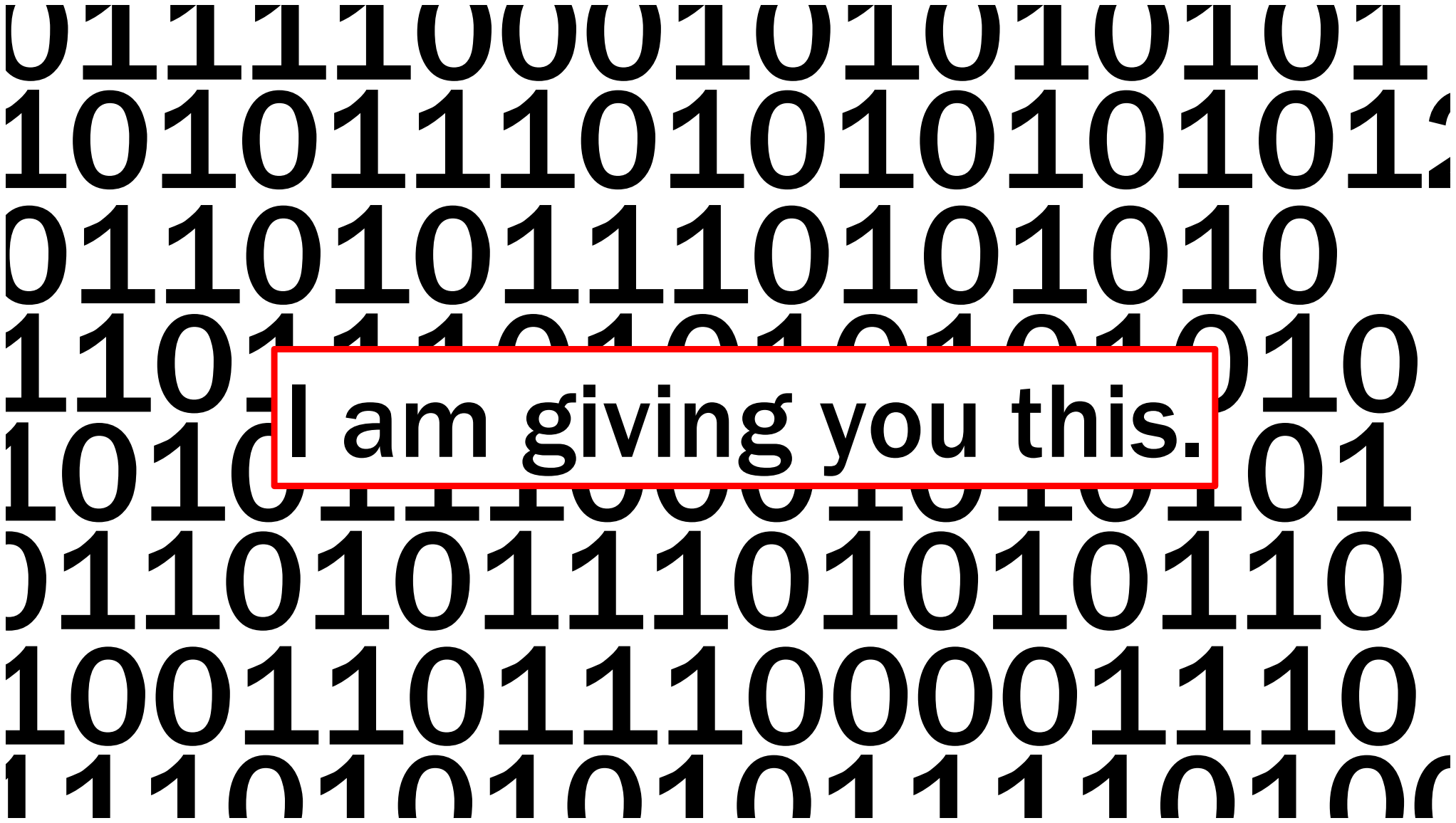

1
0
0
1
0
9V
R1
1K
R2
68K
C1
3.3µF
0V
555
EN
R
4017
IC2
R10 100
R7 220
R6 100
R3 100
D1
D2
D3
D4
D5
D6
Knight Rider Schematic
555-Timer-Circuits.com

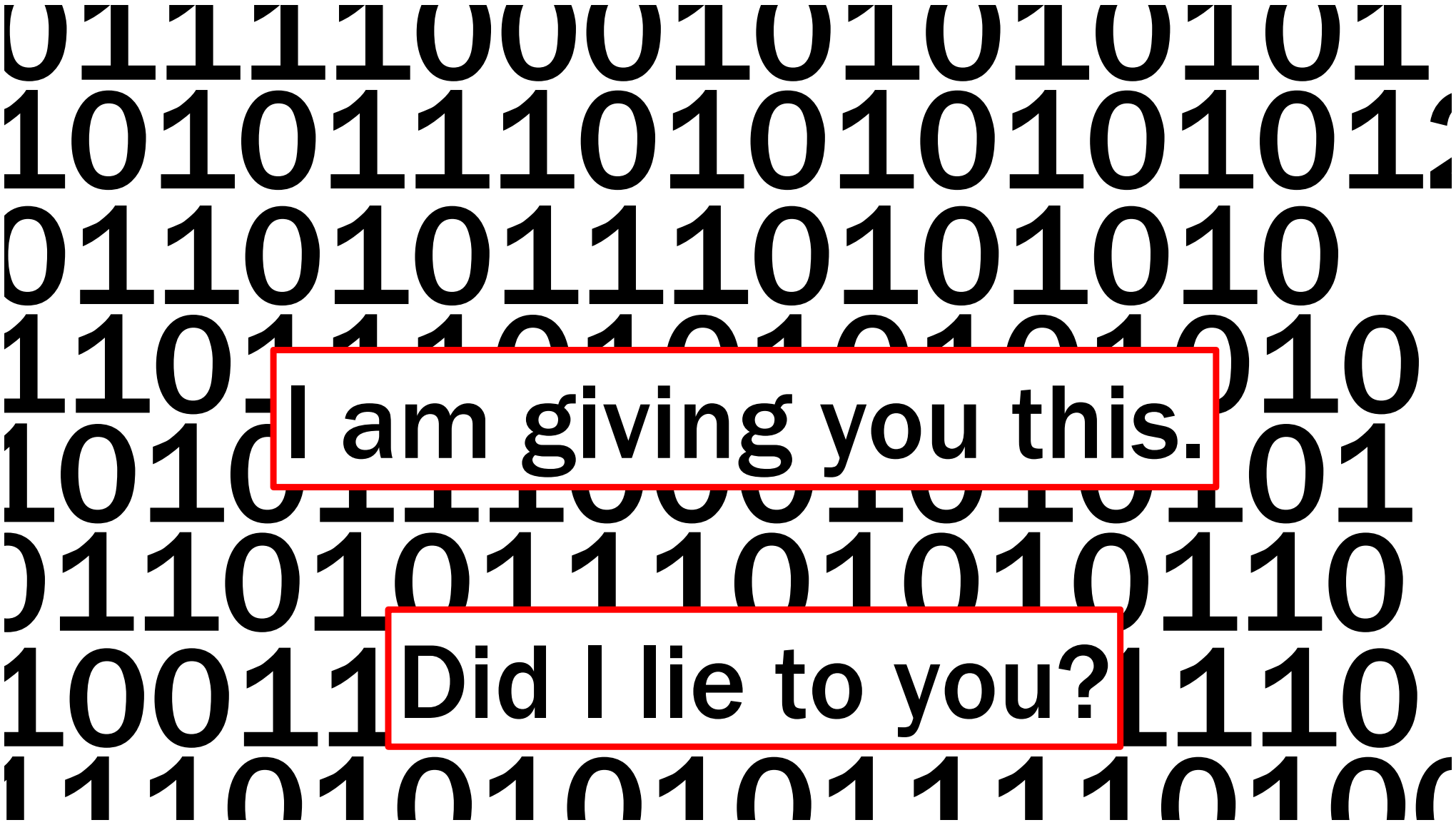
ARE THE DIGITS REALLY THERE?

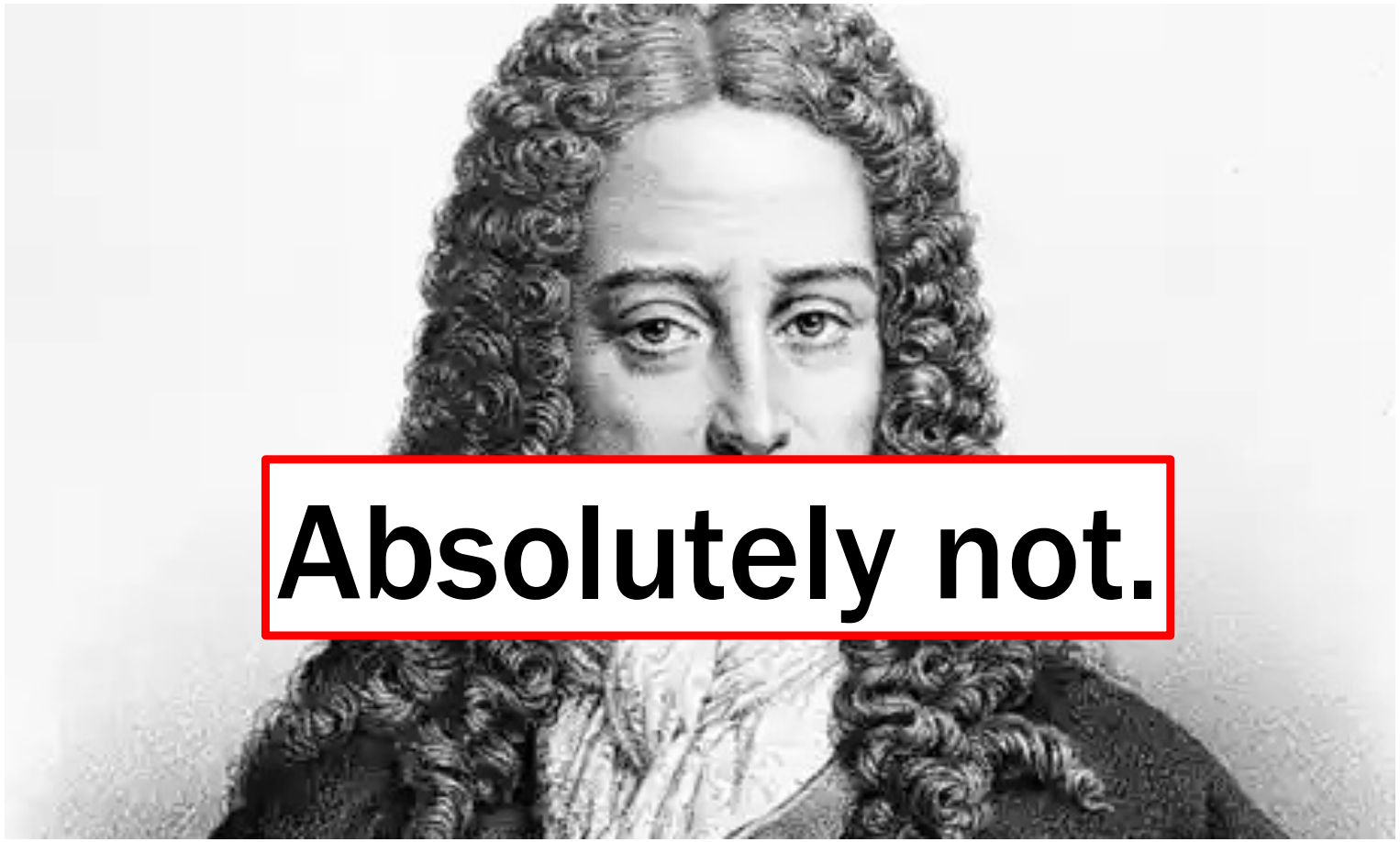
EYE OF THE BEHOLDER.

WAIT!


I promised you this.


I am giving you this.


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


Absolutely not.

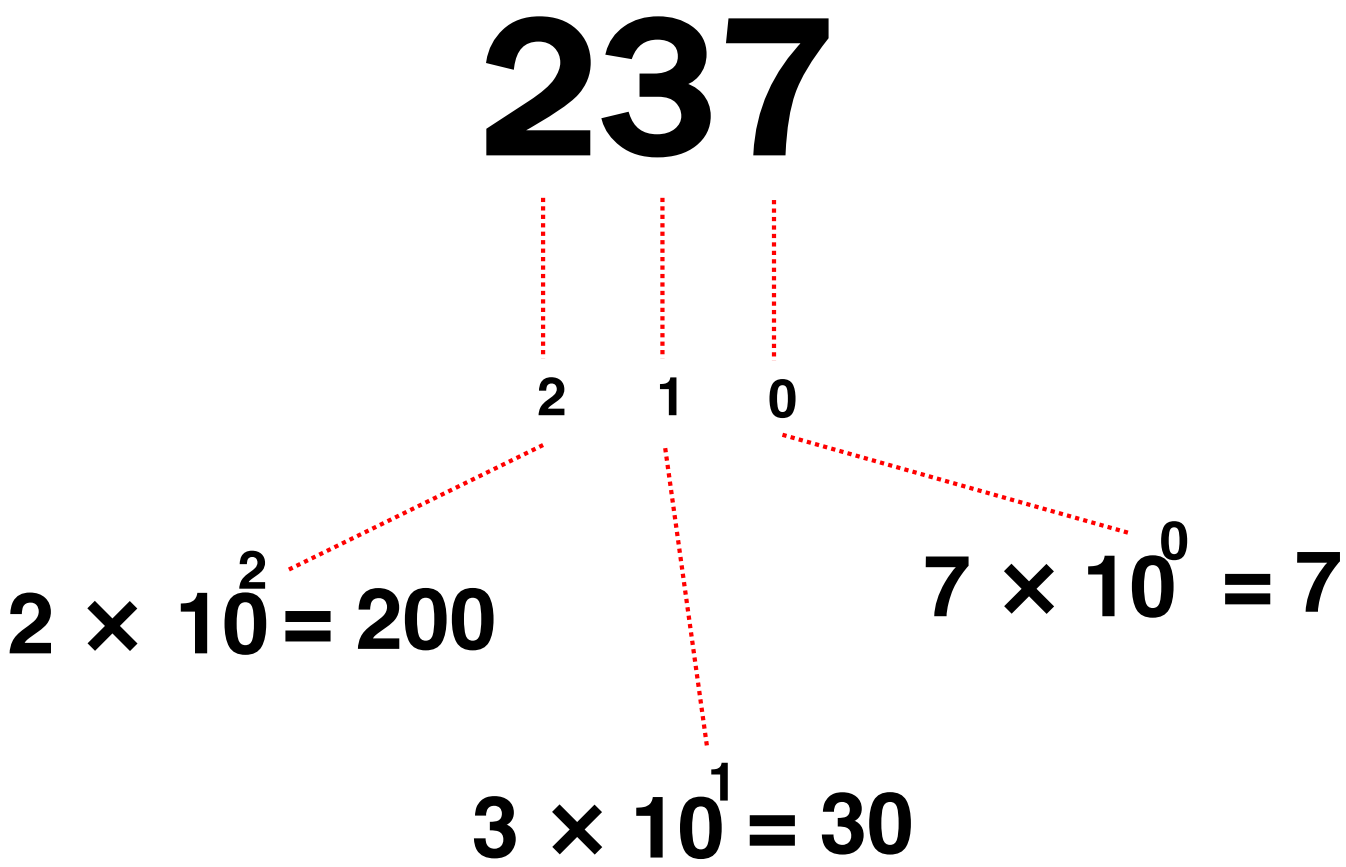
Gottfried Wilhelm Leibniz
(1646-1716)

THE BINARY SYSTEM

{0;1}

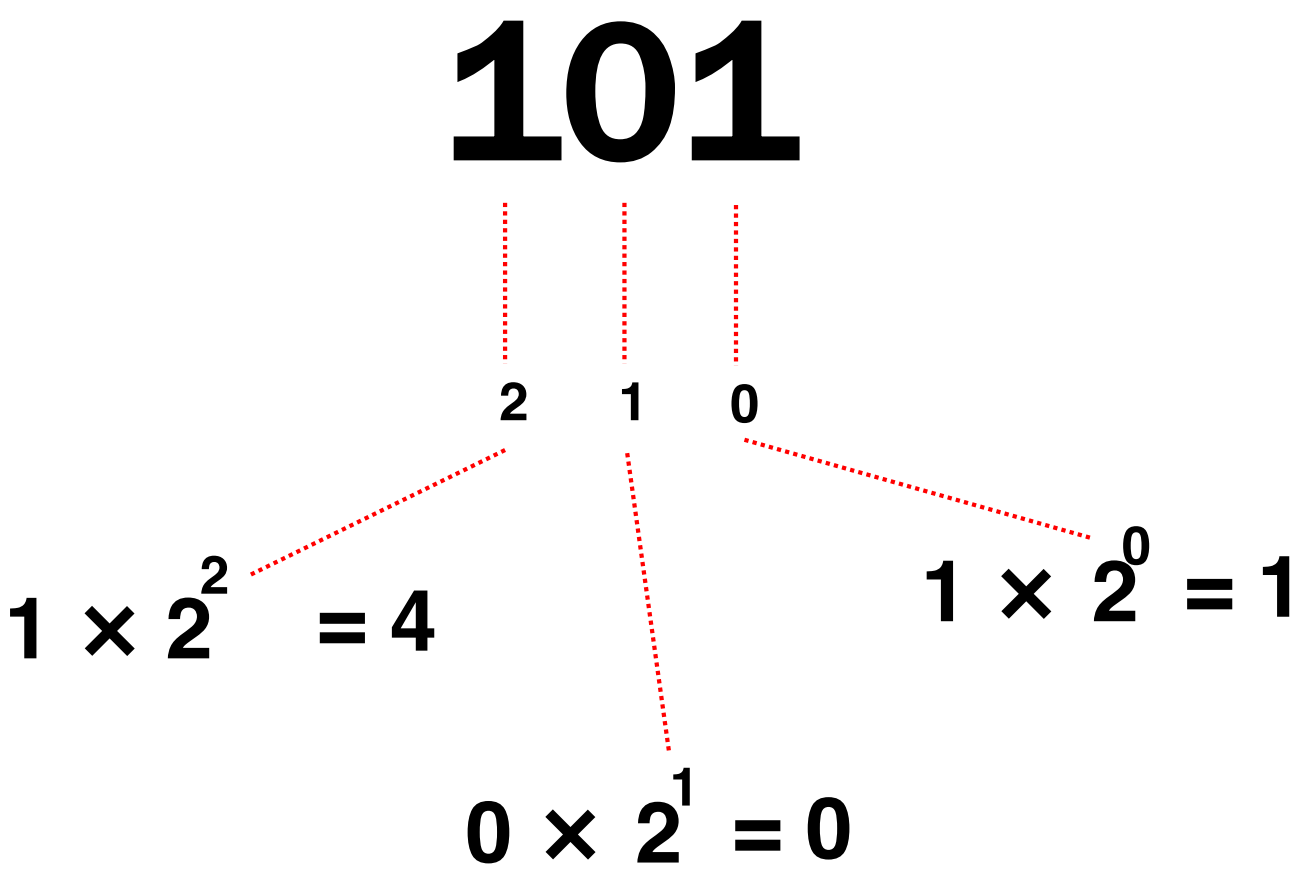
THE DECIMAL SYSTEM {0;1;2;3;4;5;6;7;8;9}

237


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

THE BINARY SYSTEM

{0;1}

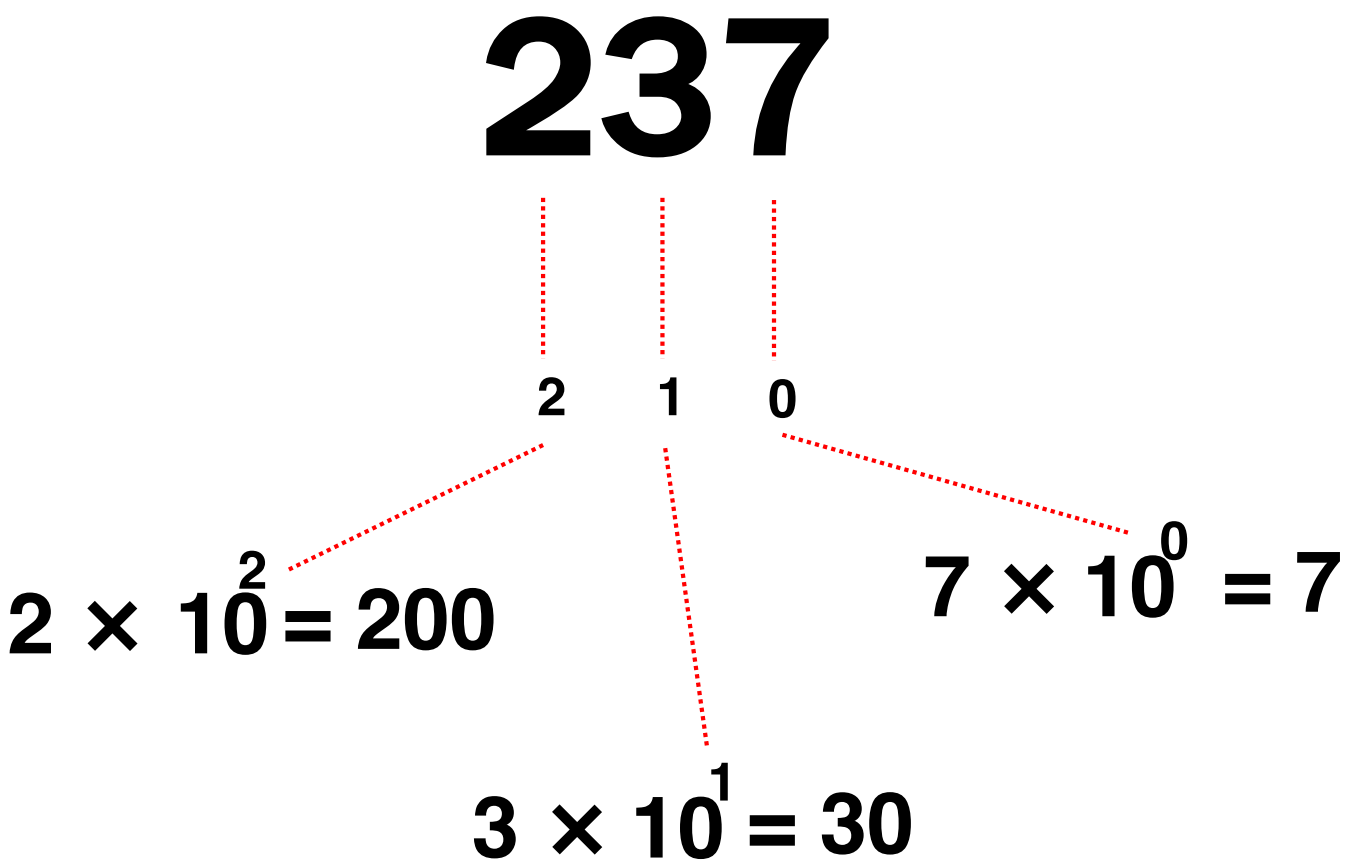

101
2 1 0
1 × 2^2 = 4
0 × 2^1 = 0
1 × 2^0 = 1

101
in binary
encodes
the number 5

$$101_2$$

$$=$$

$$5_{10}$$


237
2 1 0
2 × 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)

$$237 =$$

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

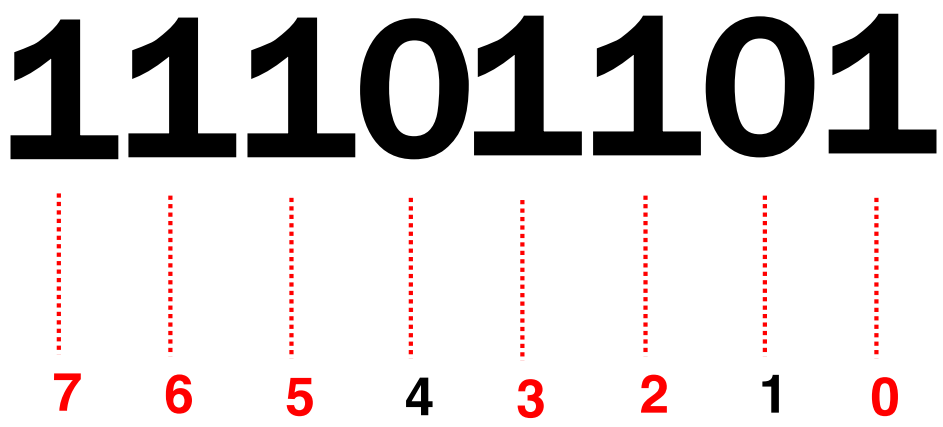
$$+ 2^3 + 2^2 + 2^0$$

$$237 =$$

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

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

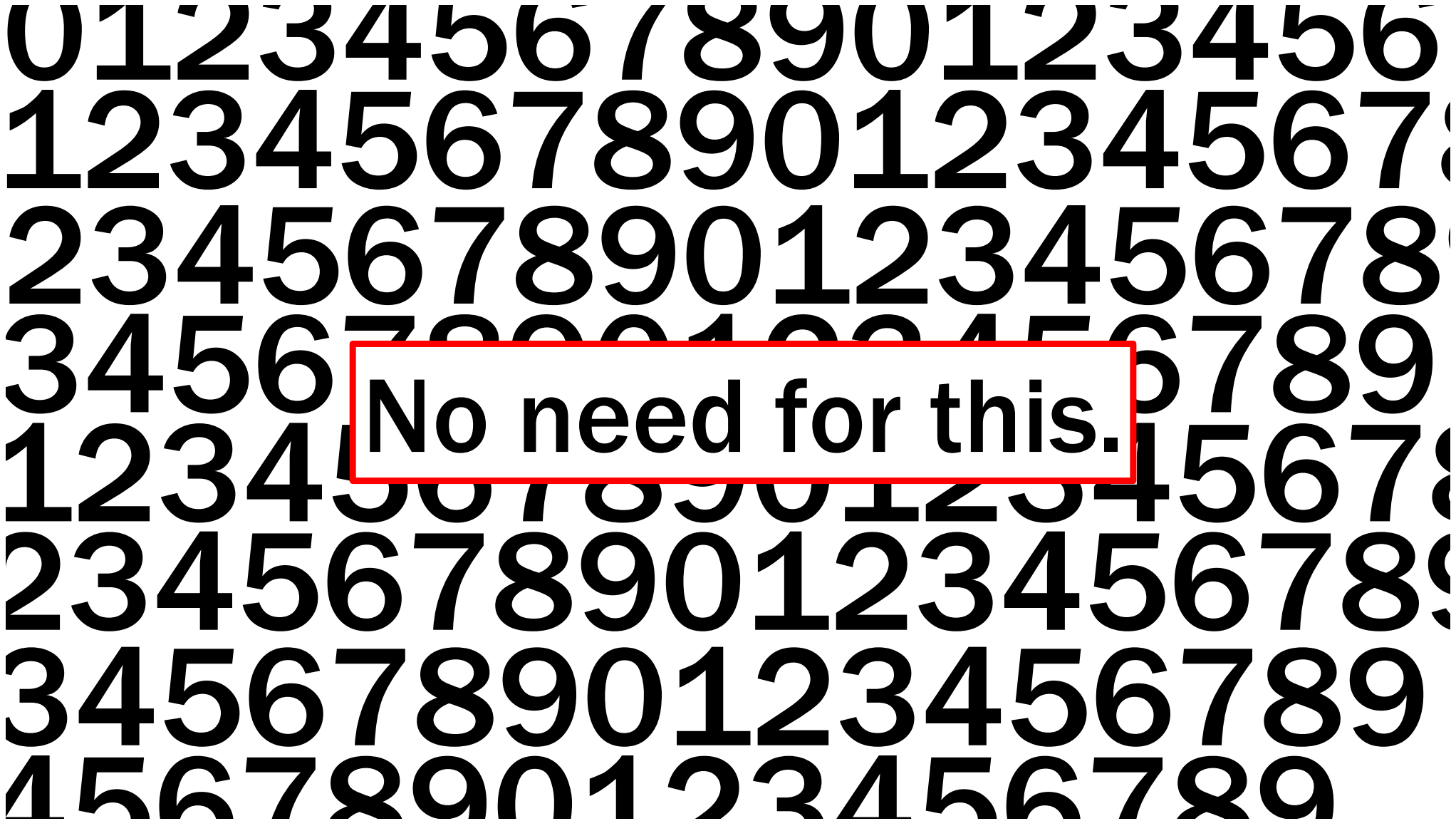
(put a 1 in the positions
indicated by the exponents,
0 in the other positions)

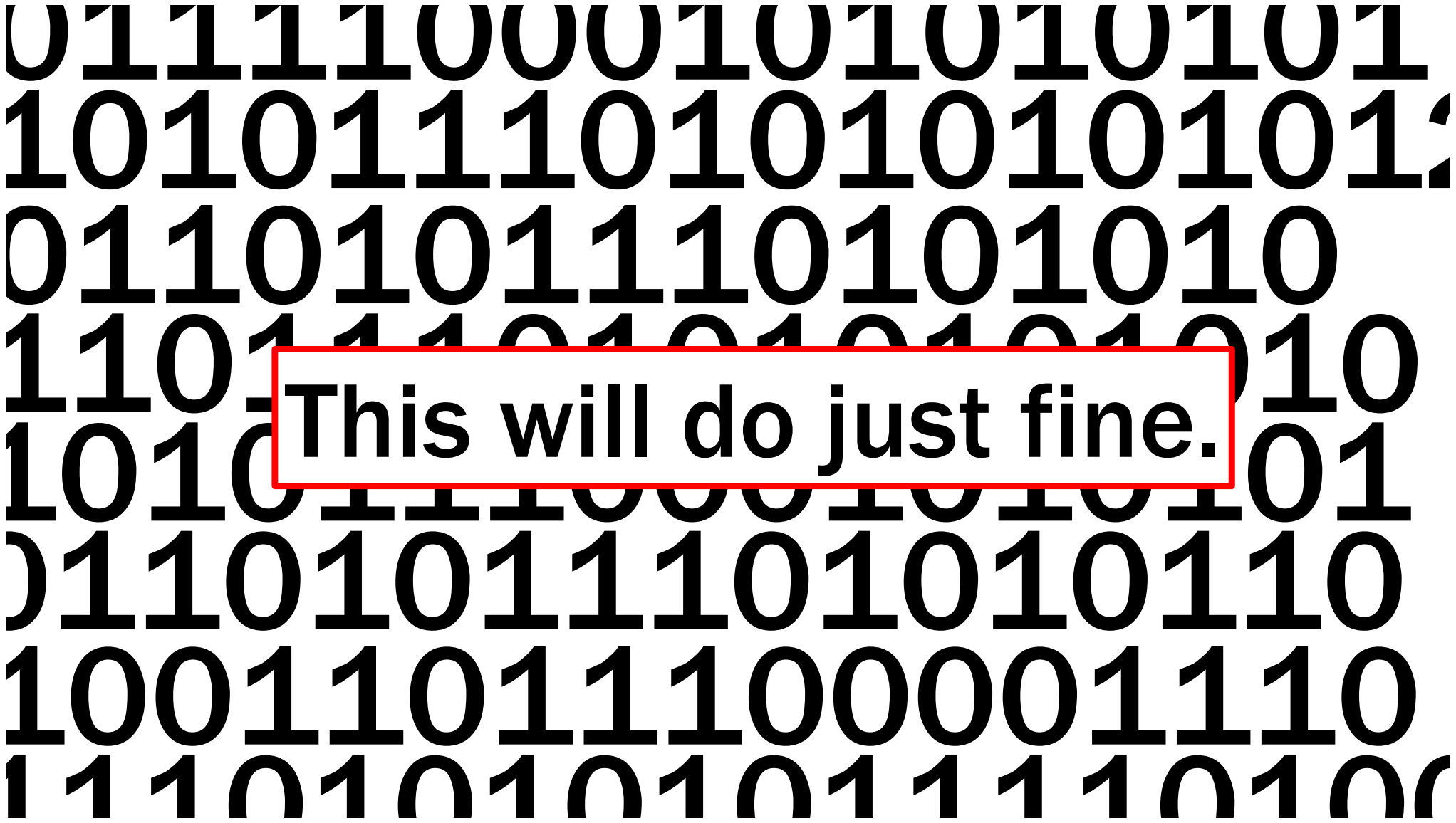

11101101
7 6 5 4 3 2 1 0

$$11101101_2$$

$$=$$

$$237_{10}$$


No need for this.


This will do just fine.

BIBLIOGRAPHY

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- **Verdicchio M., The digital in digital art*, Studi di estetica*, anno XLVI, IV serie, 3/2018**
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WEBGRAPHY

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