

اللهم صلي وسلم وبارك على سيدنا محمد
وعليه وأصحابه أجمعين





مهم جداً

هذا الملف للمراجعة السريعة واخذ الملاحظات عليه فقط ،لانه يحتوي على اقل من 20٪ مما يتم شرحه في الفيديوهات
الاستعجال والاعتماد عليه فقط سوف يجعلك تخسر كمية معلومات وخبرات كثيرة

يجب عليك مشاهدة فيديو الدرس كاملا
لاتنسى عمل لايك ومشاركة القناة لتعلم الفائدة لجميع
لا تنسونا من دعائكم

ProgrammingAdvices.com

Mohammed Abu-Hadhoud





اساسيات مهمة لكل مبرمج
تمثيل البيانات في الكمبيوتر
النظام الثنائي
Binary System

0101
1010

Mohammed Abu-Hadoud

26+ Years of Experience

MRA, PMP®, PgMP®, PMI-RMP®, CW, ITIL®, MCSD, MCSA

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LEARN THE
RIGHT WAY



Computer Foundations

How to represent data in computer?

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26+ Years of Experience

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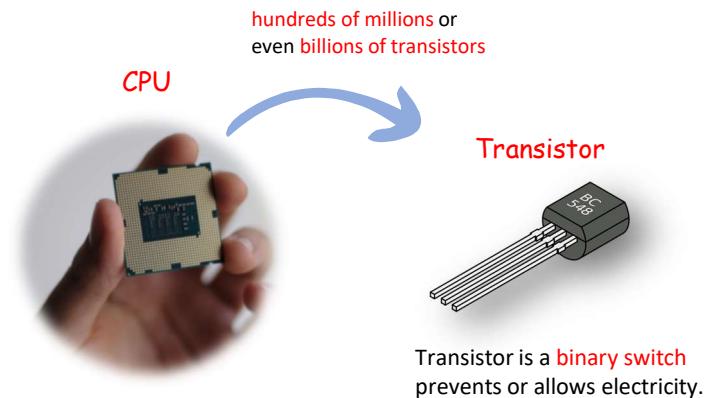


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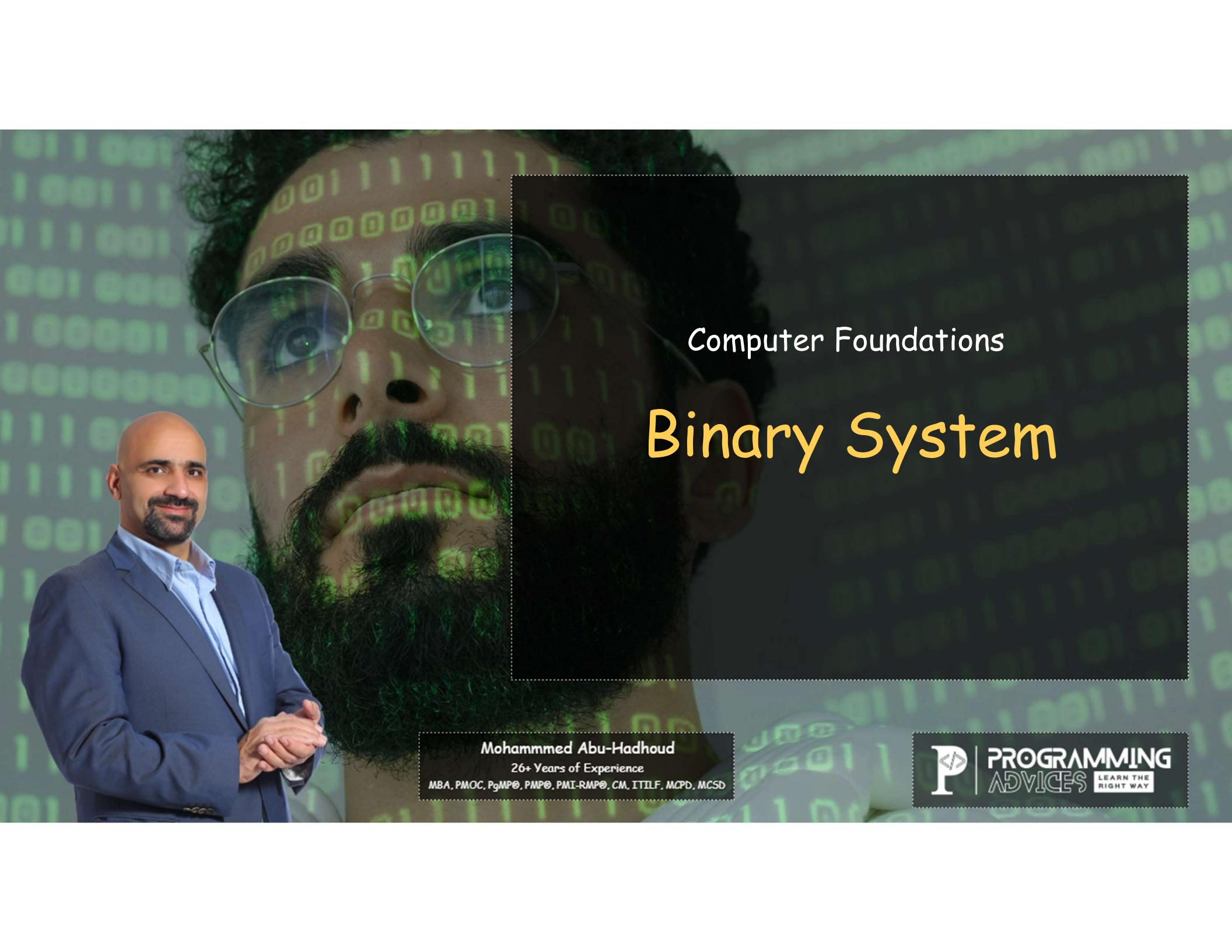
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How Computer Works?

- Computer is an electronic device.
- It deals with electricity On/Off
- It only understands 0's (Off) and 1's (On).
- Everything you see, hear and read on the screen reaches you as the result of "on" or "off" billions of times.
- Computer uses Binary System to represent numbers, letters, commands, images and sounds.



Transistor is a **binary switch** prevents or allows electricity.



Computer Foundations

Binary System

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26+ Years of Experience

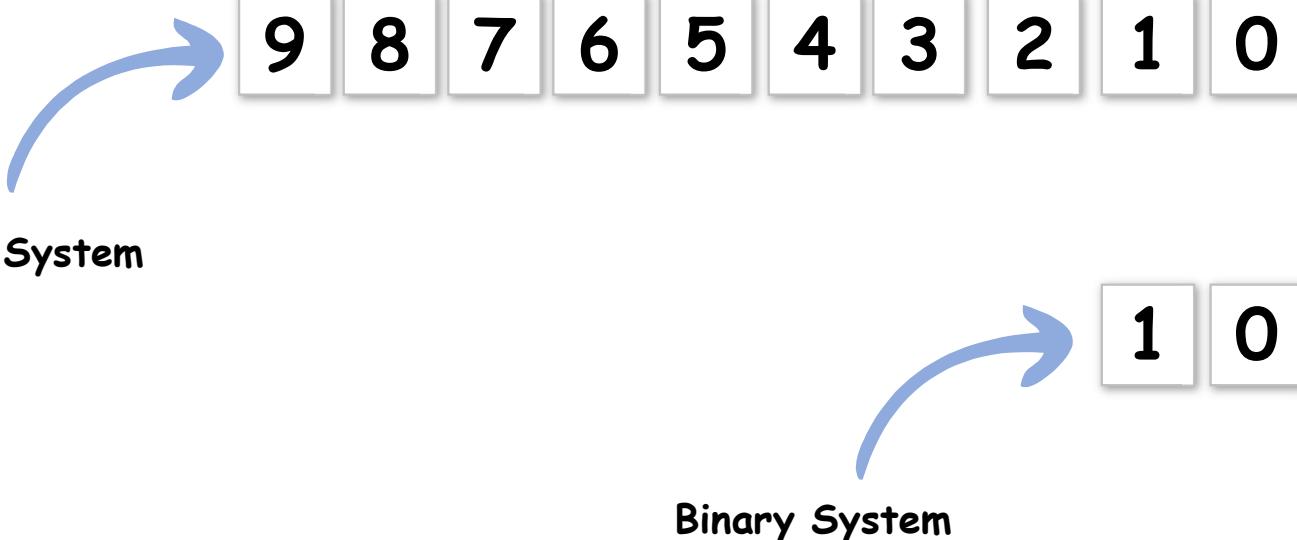
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Decimal vs Binary?





Computer Foundations

What is Bit?

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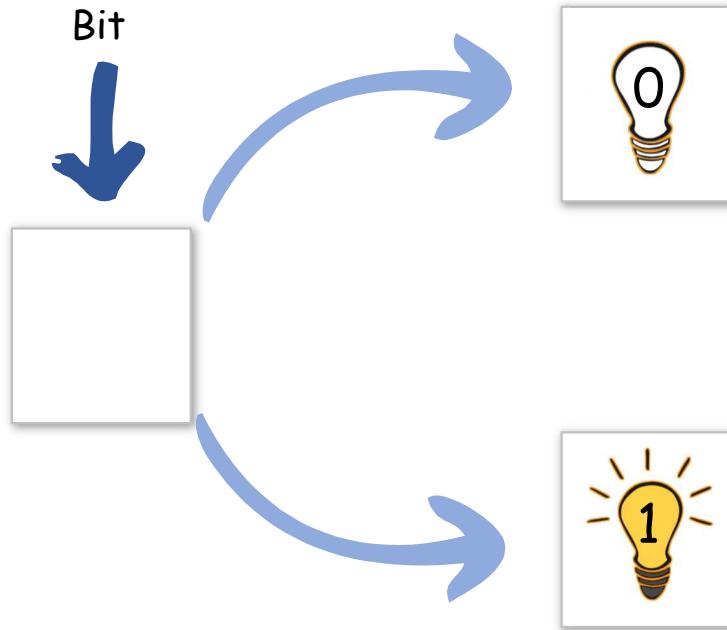
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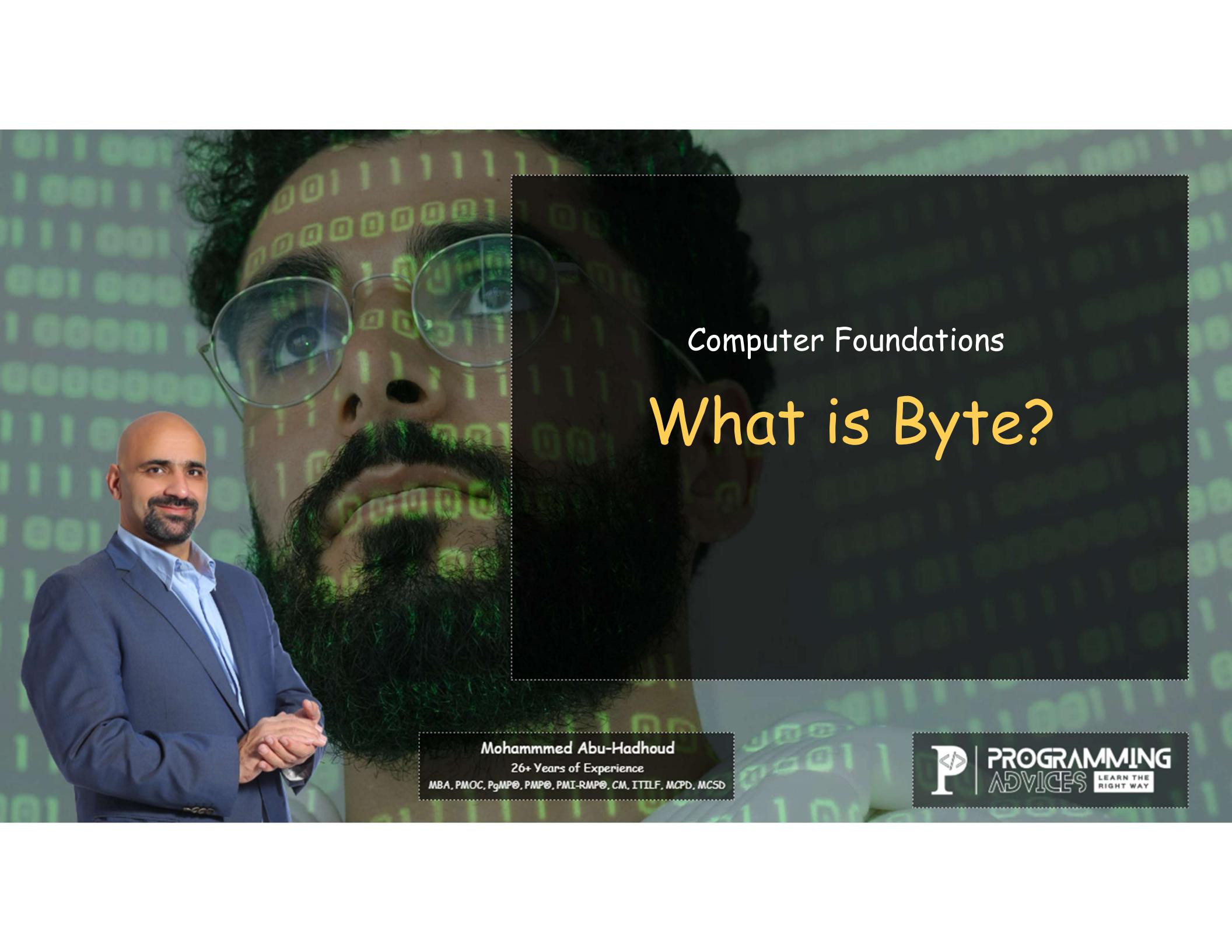
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What is "Bit"?

Remember! .. Computer is an electronic device...it deals with electricity only.



A bit is a **binary digit**,
the smallest increment
of data on a computer



Computer Foundations

What is Byte?

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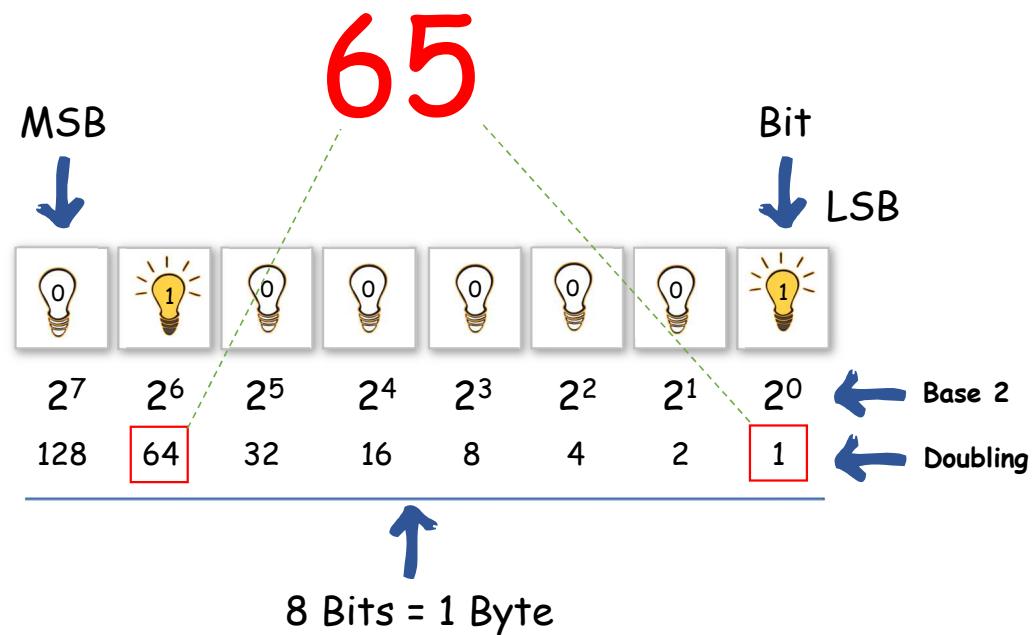
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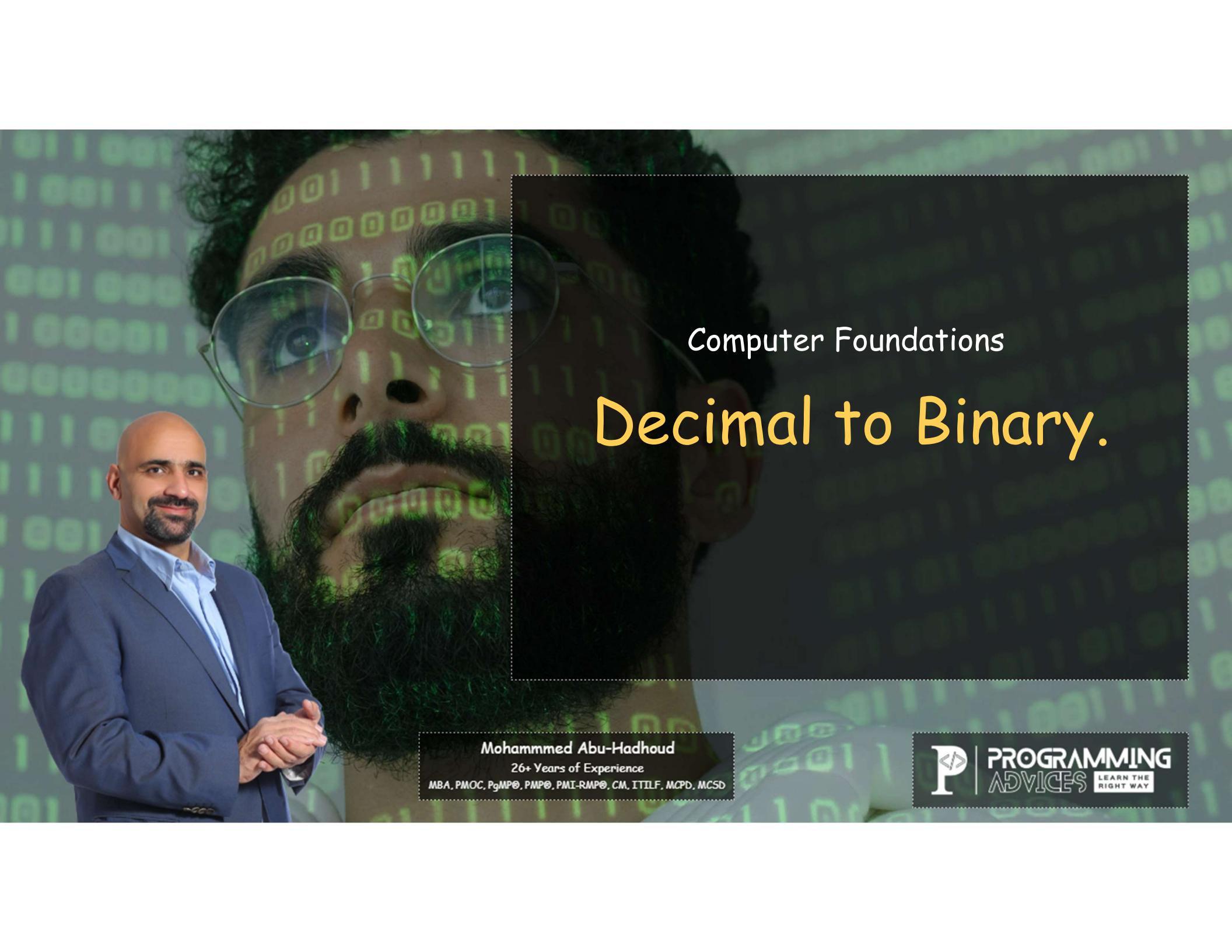


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What is Byte?





Computer Foundations

Decimal to Binary.

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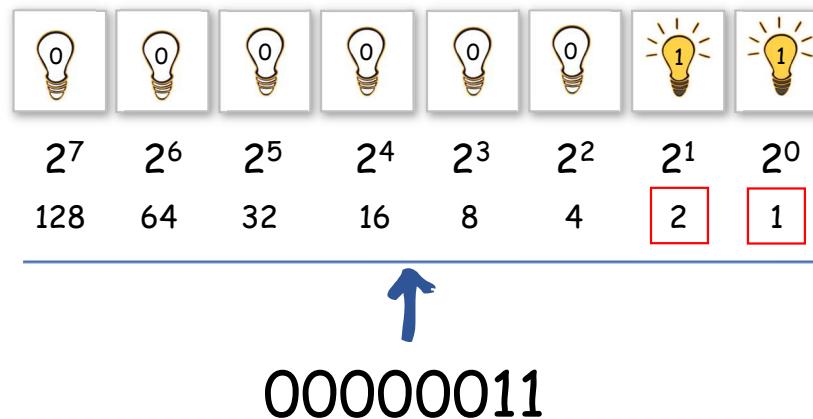
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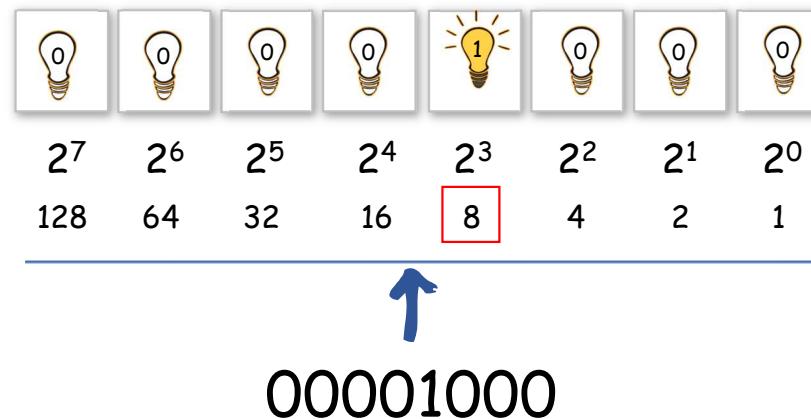
Represent this in binary...

3



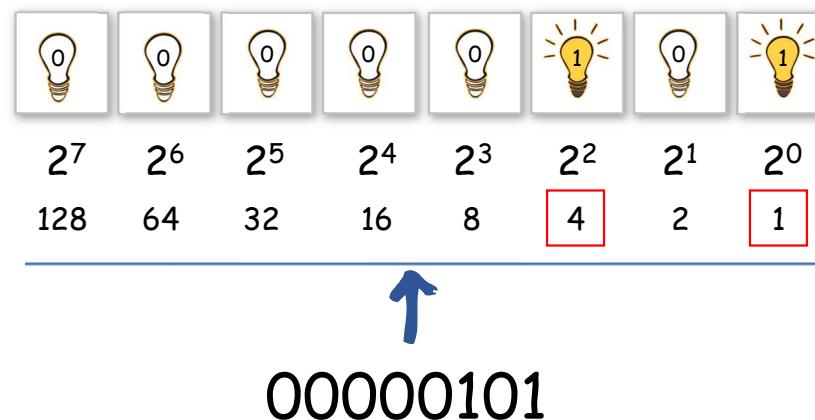
Represent this in binary...

8



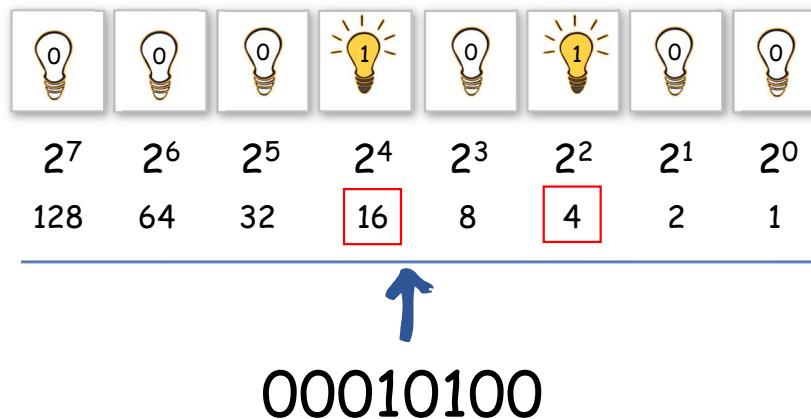
Represent this in binary...

5



Represent this in binary...

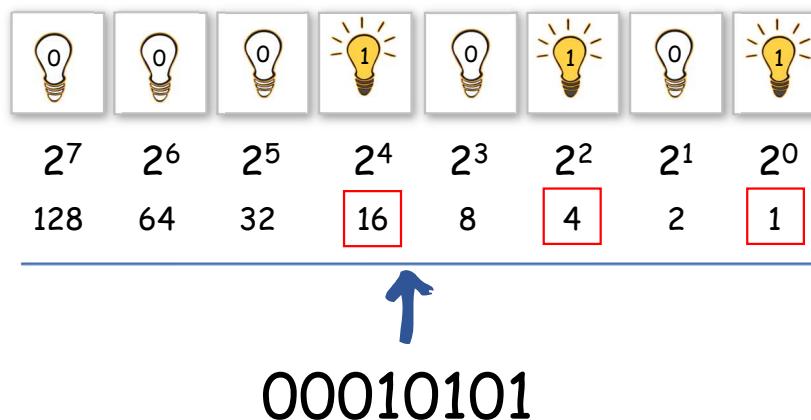
20

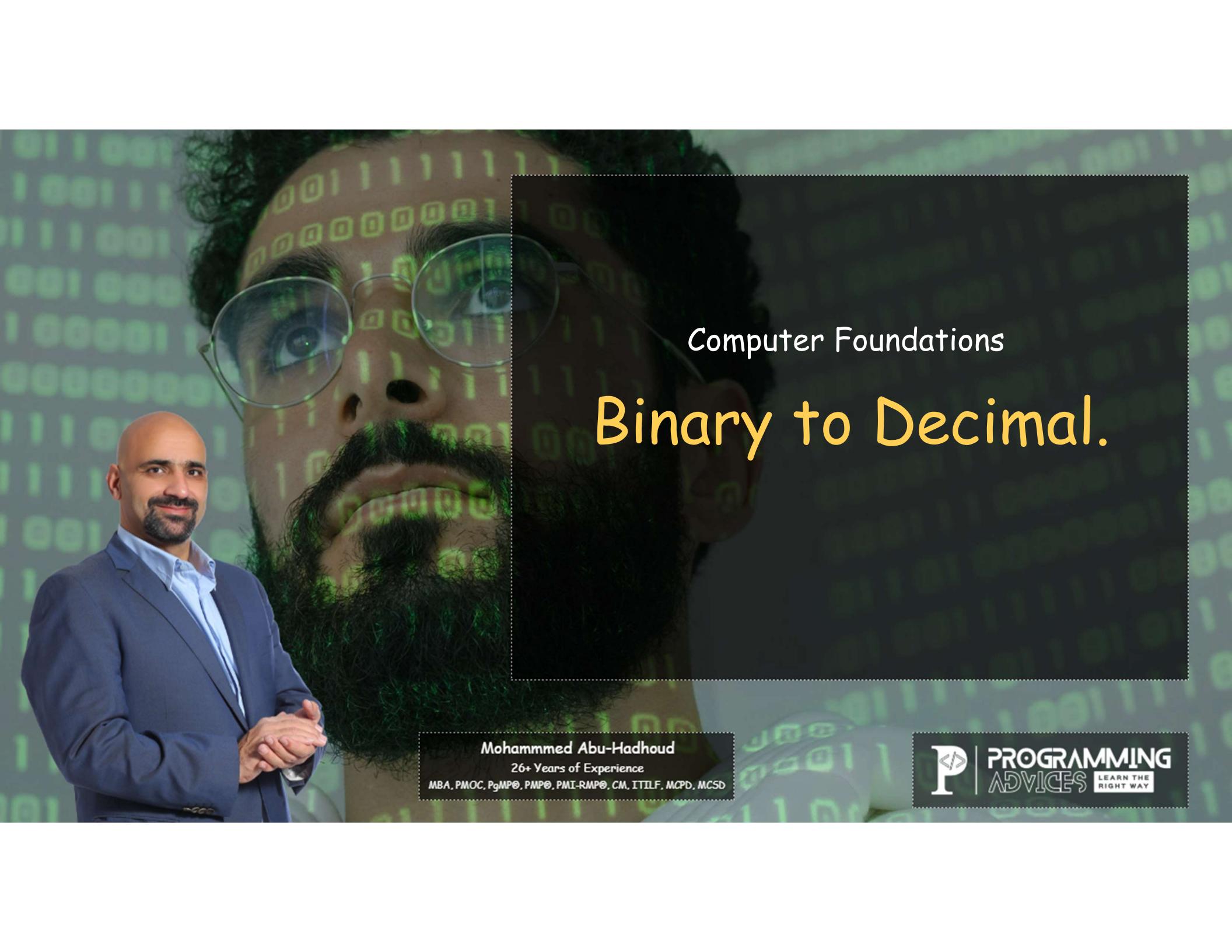


Represent this in binary...

21

Only one way
to represent Data





Computer Foundations

Binary to Decimal.

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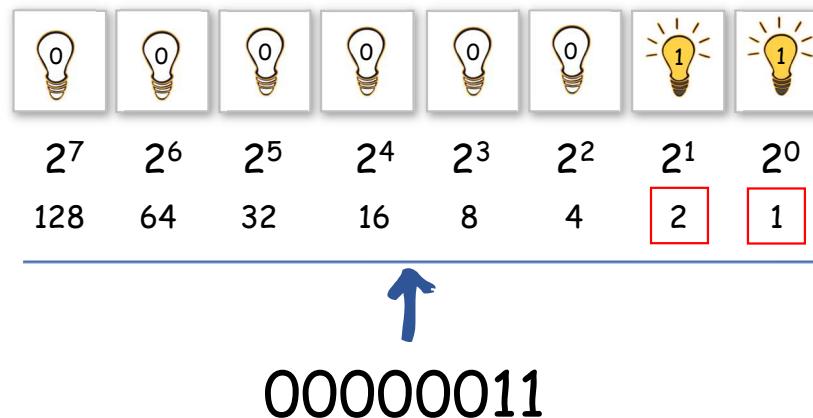
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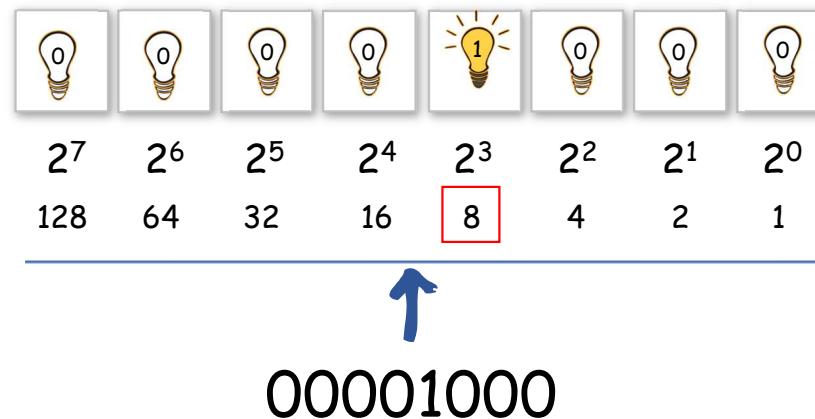
Represent this in decimal...

3



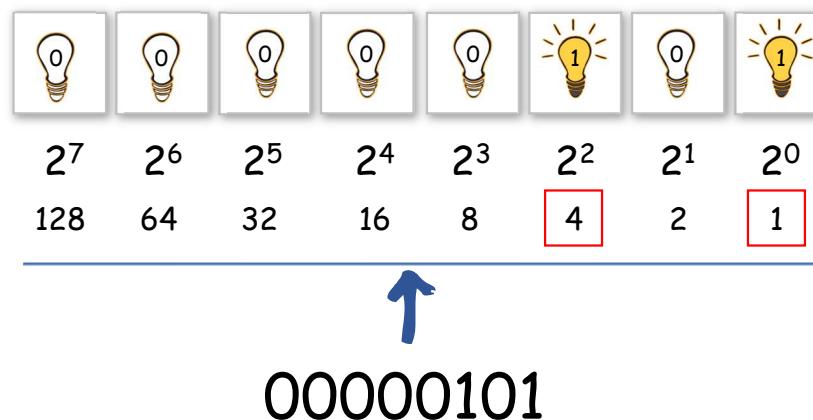
Represent this in decimal...

8



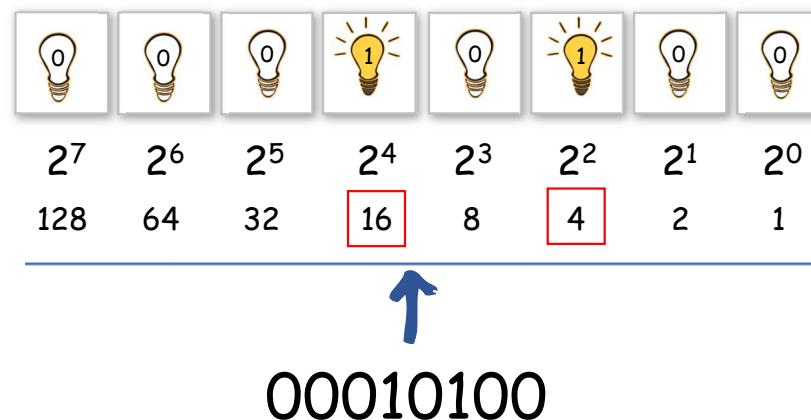
Represent this in decimal...

5



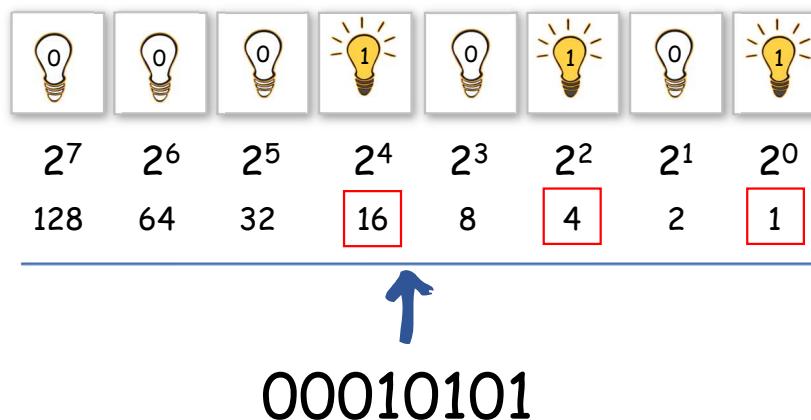
Represent this in decimal...

20



Represent this in binary...

21





Computer Foundations

Largest number in a byte?

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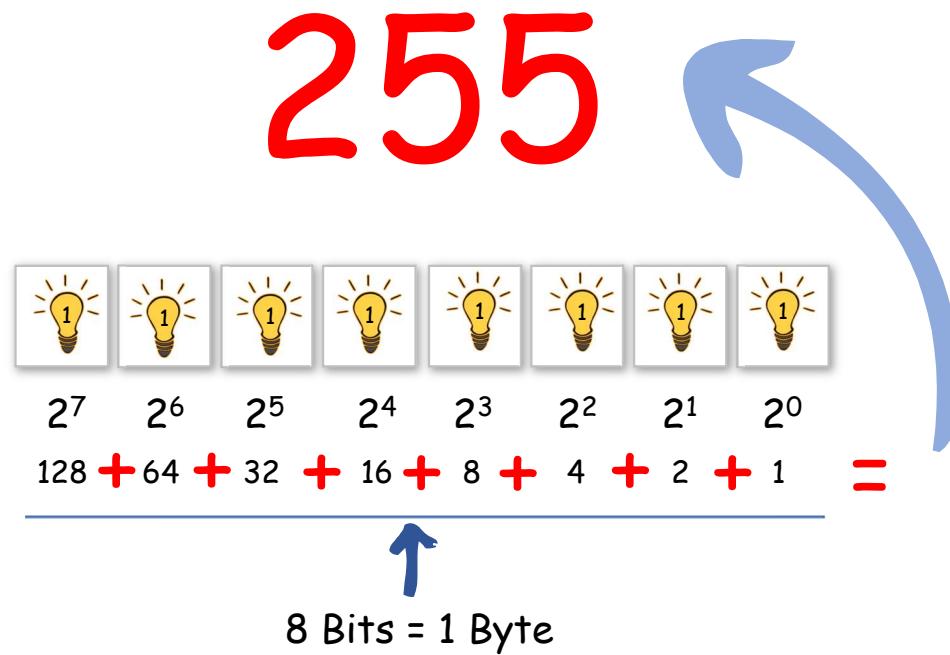
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What is the largest number in byte?

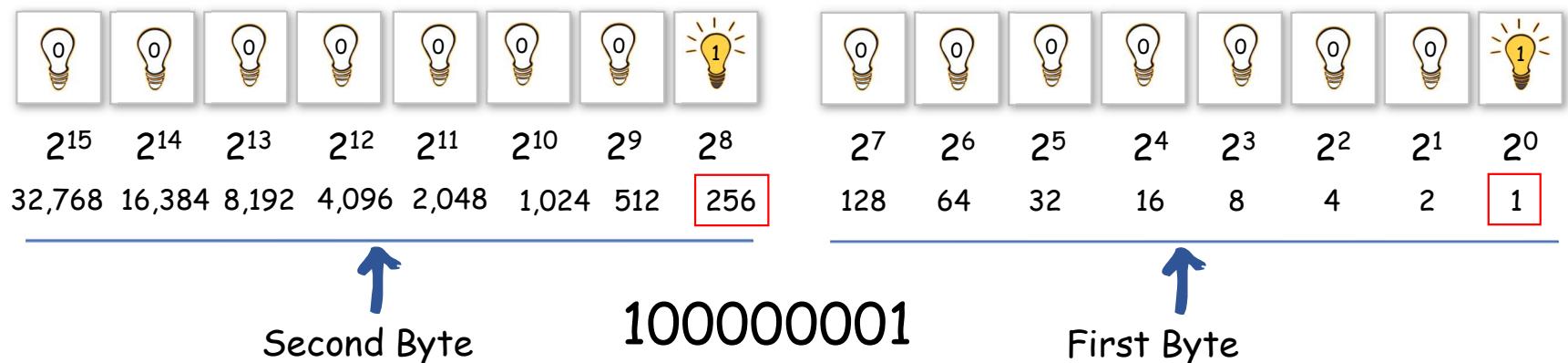


What if I have larger number such as **257**??



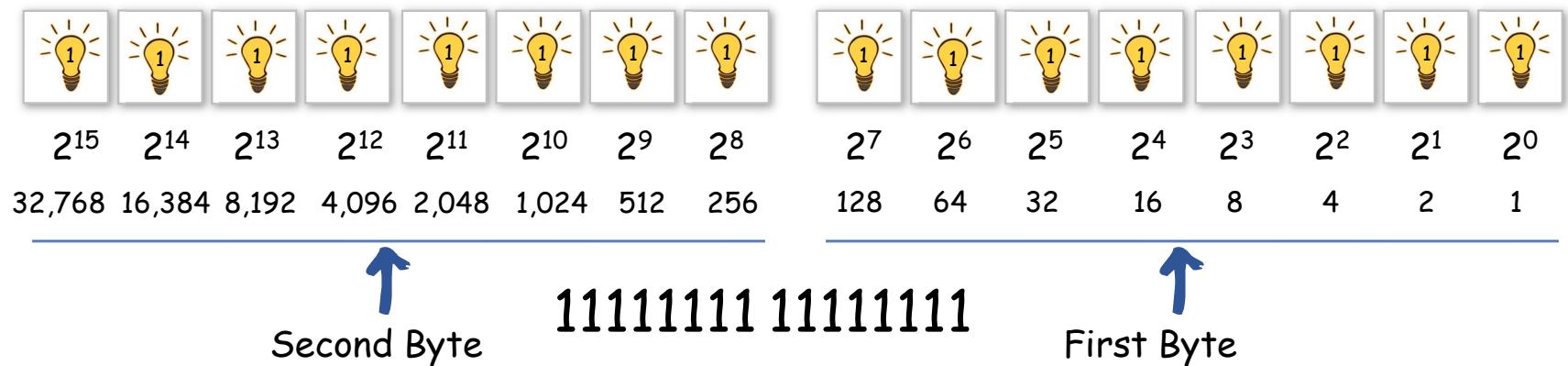
Represent this in binary...

257

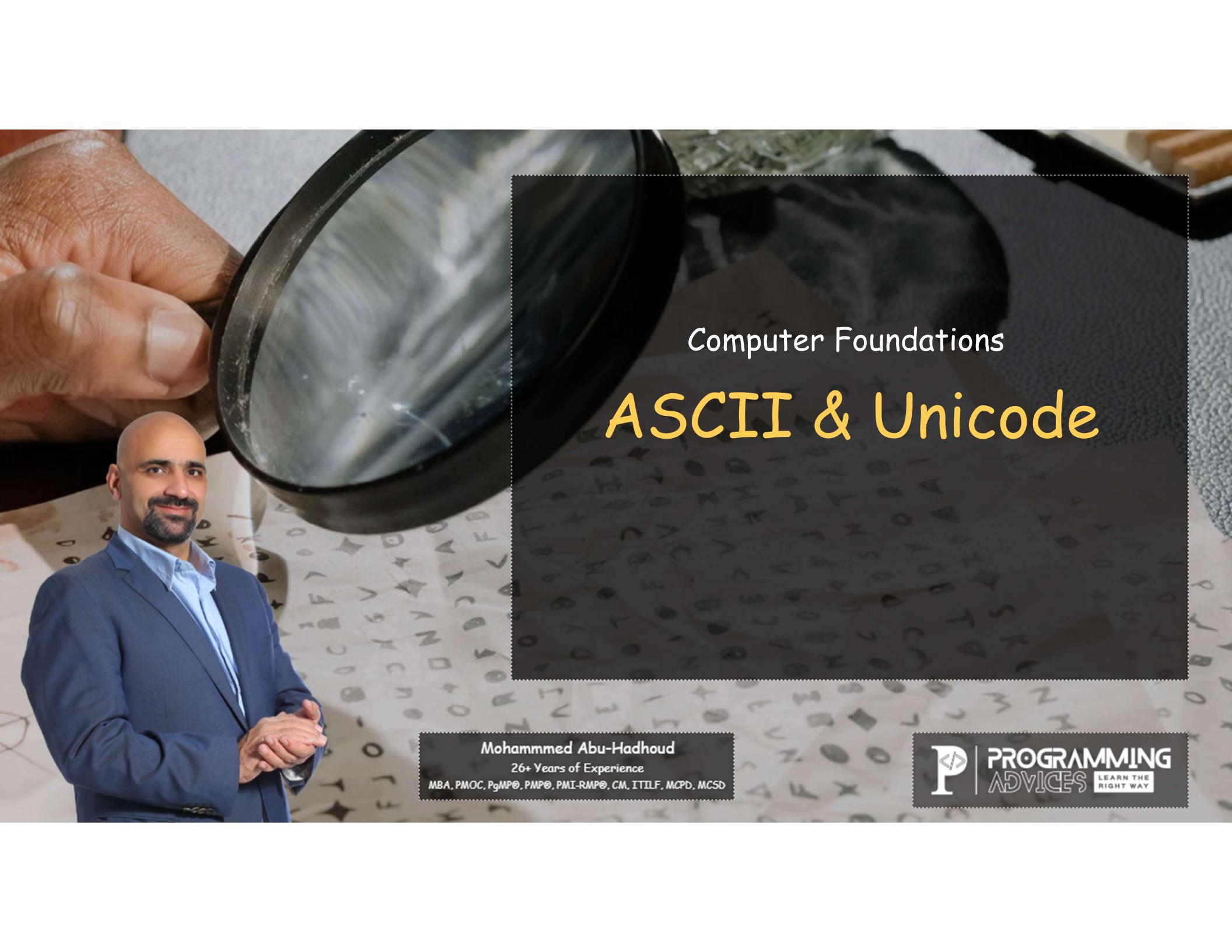


What is the largest number in 2 bytes?

65,535



But! How to represent letters?

A professional man with a beard and bald head, wearing a blue suit, stands on the left side of the image. He is looking towards the camera with his hands clasped. A large magnifying glass is held over him, focusing on a dark rectangular area containing binary code. The background is a light-colored surface covered with a grid of binary digits (0s and 1s).

Computer Foundations

ASCII & Unicode

Mohammed Abu-Hadhoud

26+ Years of Experience

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ASCII

American Standard Code
for Information
Interchange

Letter	Binary	Decimal	Letter	Binary	Decimal
A	01000001	65	a	01100001	97
B	01000010	66	b	01100010	98
C	01000011	67	c	01100011	99
D	01000100	68	d	01100100	100
E	01000101	69	e	01100101	101
F	01000110	70	f	01100110	102
G	01000111	71	g	01100111	103
H	01001000	72	h	01101000	104
I	01001001	73	i	01101001	105
J	01001010	74	j	01101010	106
K	01001011	75	k	01101011	107
L	01001100	76	l	01101100	108
M	01001101	77	m	01101101	109
N	01001110	78	n	01101110	110
O	01001111	79	o	01101111	111
P	01010000	80	p	01110000	112
Q	01010001	81	q	01110001	113
R	01010010	82	r	01110010	114
S	01010011	83	s	01110011	115
T	01010100	84	t	01110100	116
U	01010101	85	u	01110101	117
V	01010110	86	v	01110110	118
W	01010111	87	w	01110111	119
X	01011000	88	x	01111000	120
Y	01011001	89	y	01111001	121
Z	01011010	90	z	01111010	122

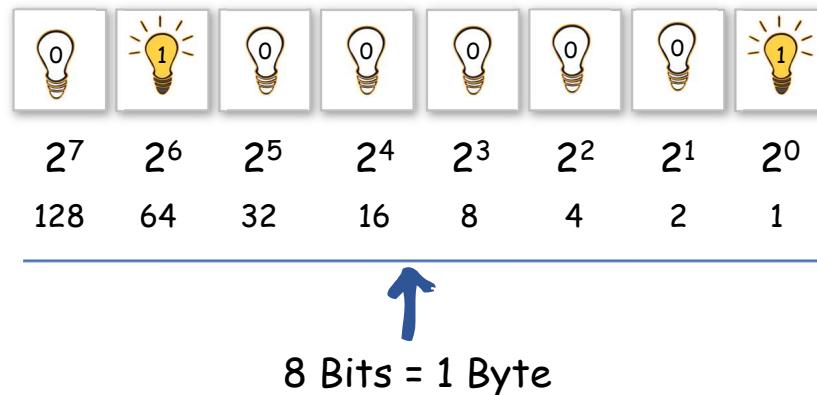
How to represent letters?

65 Or A??

هيجي في بالك طب 65 الجهاز بيخرزنه كرقم ولا حرف

الكمبيوتر بيخرزنه علي حسب السياق يعني لو السياق كلام هتبقي حرف لو ارقام هتبقي رقم وهكذا

65 A



<https://www.rapidtables.org/ar/convert/number/ascii-to-binary.html>



لسه مترفش اسمك باینری
خش شوف بسرعه

This is my name in binary:

Mohammed Abu-Hadhoud

01001101 01101111 01101000 01100001 01101101 01101101
01100101 01100100 00100000 01000001 01100010 01110101
00101101 01001000 01100001 01100100 01101000 01101111
01110101 01100100

Machine Language

What does this mean?

01001001 00100000 01001100 01101111 01110110 01100101
00100000 01011001 01101111 01110101 00100001



I Love You!

ابعدهاله 😂



But!

How to represent Arabic letters?



Computer Foundations

Unicode

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26+ Years of Experience

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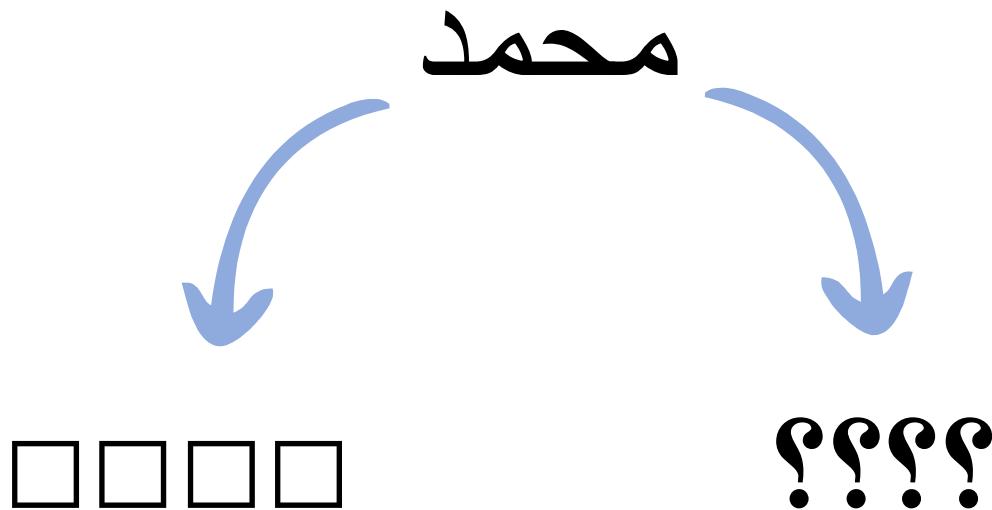


ASCII

American Standard Code
for Information
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E	01000101	69	e	01100101	101
F	01000110	70	f	01100110	102
G	01000111	71	g	01100111	103
H	01001000	72	h	01101000	104
I	01001001	73	i	01101001	105
J	01001010	74	j	01101010	106
K	01001011	75	k	01101011	107
L	01001100	76	l	01101100	108
M	01001101	77	m	01101101	109
N	01001110	78	n	01101110	110
O	01001111	79	o	01101111	111
P	01010000	80	p	01110000	112
Q	01010001	81	q	01110001	113
R	01010010	82	r	01110010	114
S	01010011	83	s	01110011	115
T	01010100	84	t	01110100	116
U	01010101	85	u	01110101	117
V	01010110	86	v	01110110	118
W	01010111	87	w	01110111	119
X	01011000	88	x	01111000	120
Y	01011001	89	y	01111001	121
Z	01011010	90	z	01111010	122

Problem:



اوسع من الاسكي شويه بتحتني على جميع الحروف والارقام والاستيكرز وكل حاجه بكل لغات العالم

UNICODE

Unicode is an International character encoding standard

Unicode is a universal character encoding standard that assigns a code to every character and symbol in every language in the world.

ASCII

VS

UNICODE

American Standard Code for Information Interchange

Universal Coding System

Supports specific characters (less space)

Large number of characters (large space)

Has 2 standards:
7-bit ASCII - 128 characters
8-bit ASCII - 256 characters

It has 3 standards:
UTF 8 - 256 characters
UTF 16 - 65,536 characters
UTF 32 - 4,294,967,296 characters

Only one language

Any combination of languages

Differences



اساسيات مهمة لكل مبرمج

اكبر رقم في رقعة الشطرنج
Binary System

0|0|0
0|0|0

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26+ Years of Experience

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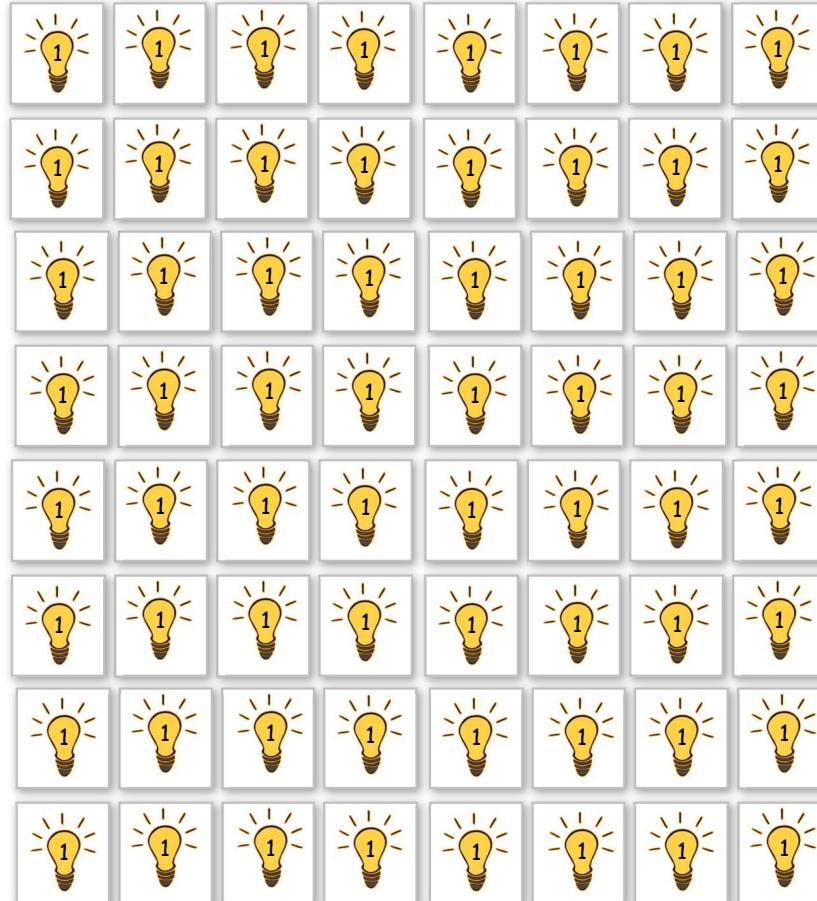
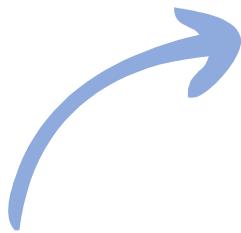
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64 Bits = 8 Bytes



128	64	32	16	8	4	2	1
32,768	16,384	8,192	4,096	2,048	1,024	512	256
8,388,608	4,194,304	2,097,152	1,048,576	524,288	262,144	131,072	65,536
2,147,483,648	1,073,741,824	536,870,912	268,435,456	134,217,728	67,108,864	33,554,432	16,777,216
5.49756E+11	2.74878E+11	1.37439E+11	68,719,476,736	34,359,738,368	17,179,869,184	8,589,934,592	4,294,967,296
??							

9,223,372,036,854,780,000

128	64	32	16	8	4	2	1
32,768	16,384	8,192	4,096	2,048	1,024	512	256
8,388,608	4,194,304	2,097,152	1,048,576	524,288	262,144	131,072	65,536
2,147,483,648	1,073,741,824	536,870,912	268,435,456	134,217,728	67,108,864	33,554,432	16,777,216
5.49756E+11	2.74878E+11	1.37439E+11	68,719,476,736	34,359,738,368	17,179,869,184	8,589,934,592	4,294,967,296
??							

18,446,744,073,709,600,000



Homework



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1- Represent those numbers in binary...

- 512
- 44
- 129
- 717
- 999



يلا ي حببي حل

2- Write your name in binary and put it in the comments.

Thank you ☺

01010100 01101000 01100001 01101110 01101011 00100000
01111001 01101111 01110101 00100000 00111010 00101001
00001010

وقل استغفروا ربكم انه كان غفارا