computer?

calculator -> computer

computer -> 1 and 0

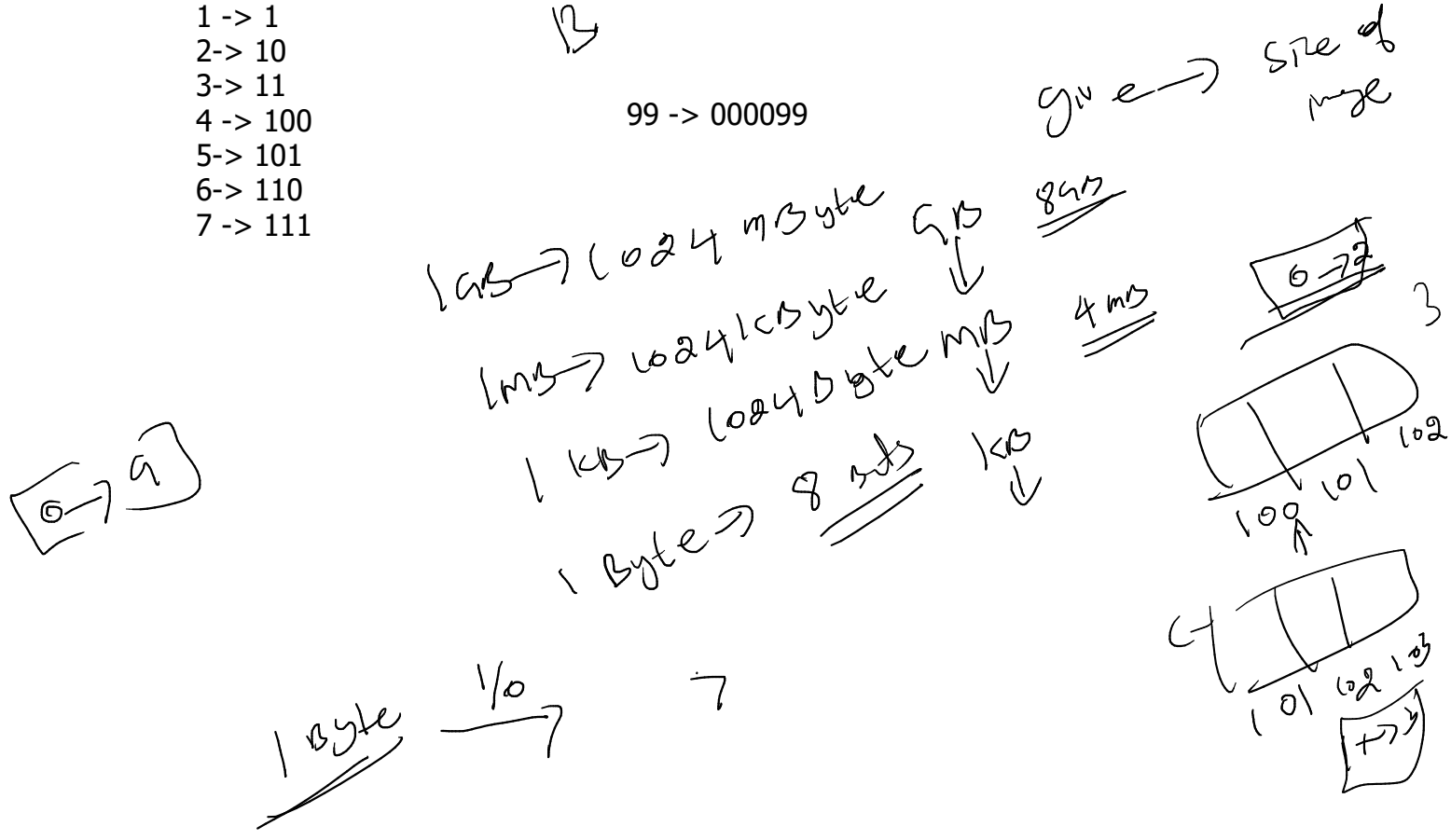
32 -> computer?

how?

convert 32-> 10
convert decimal -> binary

0 -> 0
1 -> 1
2-> 10
3-> 11
4 -> 100
5-> 101
6-> 110
7 -> 111

99 -> 000099



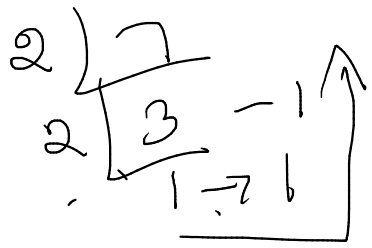
3^2

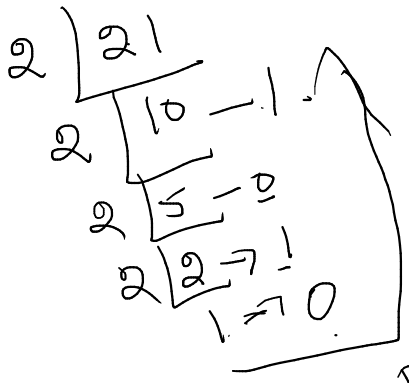
1 Byte → 8 bits

0 → 7

7 6 5 4 3 2 1 0

Decimal → Binary





Dec → Bin
21 → 10101

16 8 4 2 1
1 0 1 0 1

(21)

Dec → Bin
21 → 10101

Dec ←

De → Bi ←

1 0 1 0 1
2^4 2^3 2^2 2^1 2^0

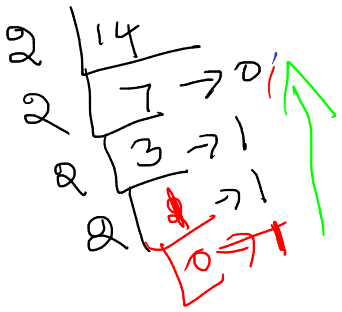
$(2^4 * 1) + (2^3 * 0) + (2^2 * 1) + (2^1 * 0) + (2^0 * 1)$

16 + 0 + 4 + 0 + 1 = 21

14

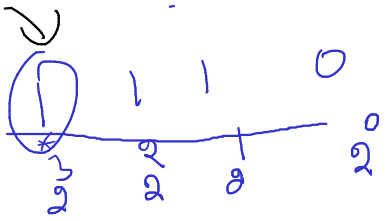
Dec → Binary

14 → 1110



1 1 1 0

Binary → Dec



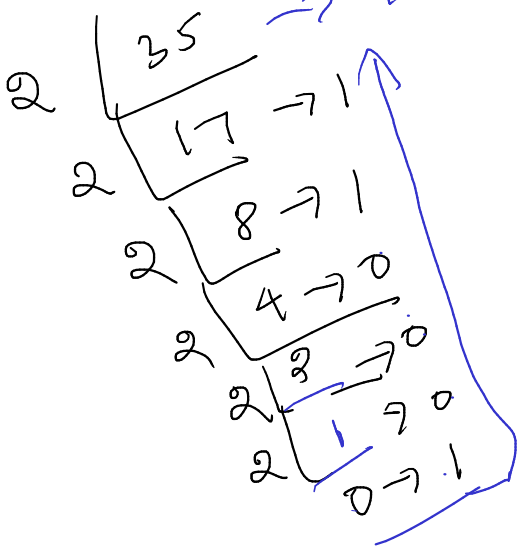
$= (2^3 * 1) + (2^2 * 1) + (2^1 * 1) + (2^0 * 0)$

$= 14 \quad (8 + 4 + 2 + 0)$

$= 14$

100011

35



$2^3 = 1$

0 1 0 0 0 1 1

5 4 3 2 1 0

$(2^5 * 1) + (2^1 * 1) + (2^6 * 1)$

$32 + 2 + 1$

35

7 6 5 4 3 2 1 0

1 0 0 0 1 1

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

$$(2^5 * 1) + (2^4 * 0) + (2^3 * 0) + (2^2 * 0) + (2^1 * 1) + (2^0 * 1)$$

$$32 + 0 + 0 + 0 + 2 + 1$$

$$= 35$$

2 | 11
2 | 5 → 1
2 | 2 → 1
2 | 1 → 0
0 → 1

4 3 2 1 0

11 → 1 0 1 1

2^3 2^2 2^1 2^0

$2 \to 1, 0$

$$= (2^3 * 1) + (2^2 * 0) + (2^1 * 1) + (2^0 * 1)$$

$$= 8 + 0 + 2 + 1 = 11$$

8 | 11
8 | 1 → 3
0 → 1

11 → 13

Binary → 0 1

Octal → 0 1 2 3 4 5 6 7

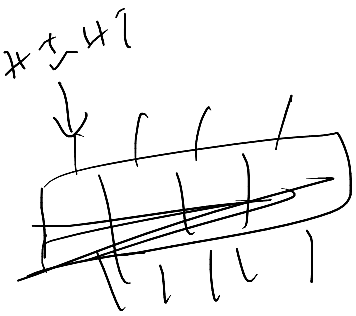
8 → 10 (8^1 8^0)

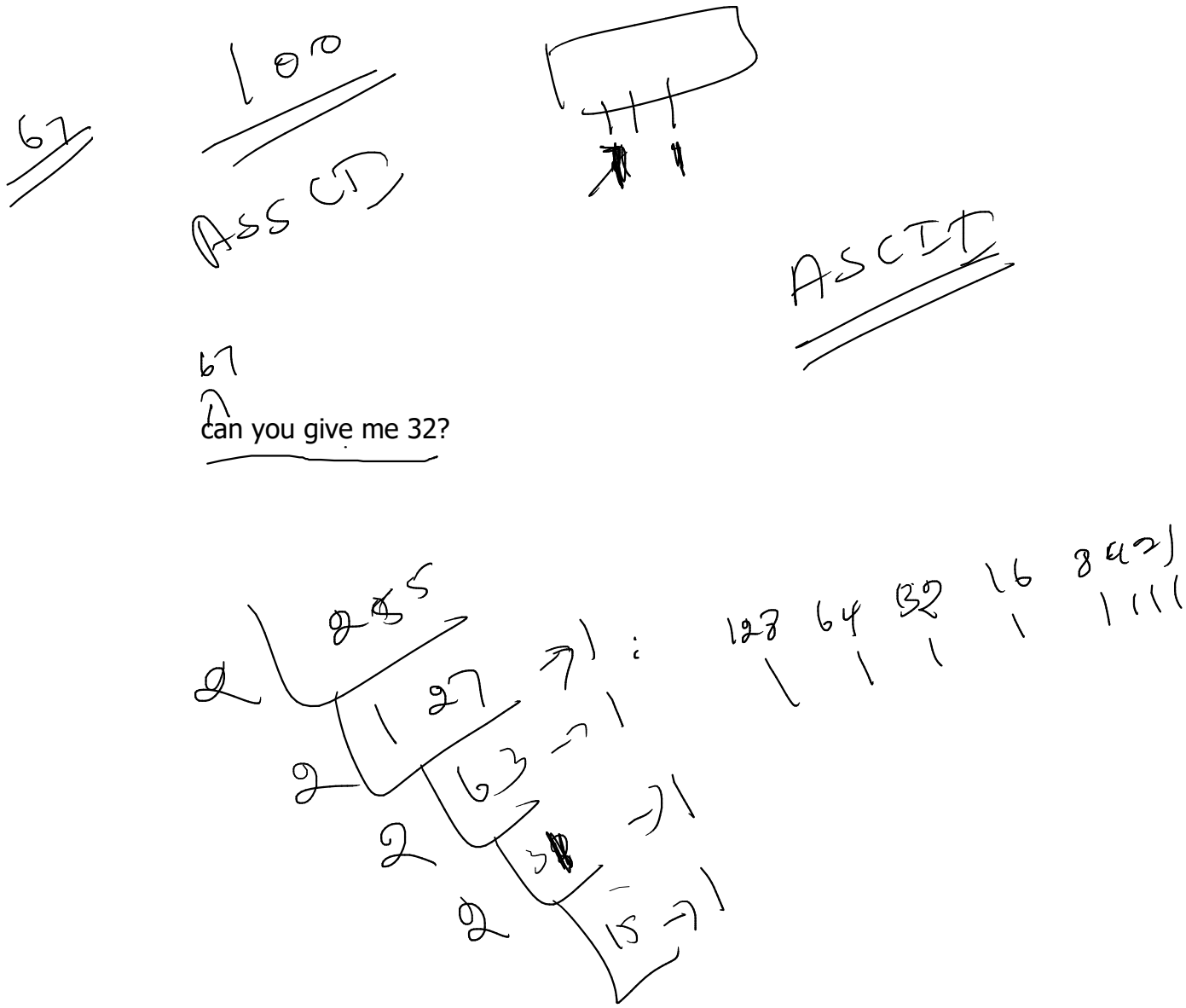
3 → 11

1 0

$(8*1)$ $8^0 * 0$ = 8

011 110





A (char to binary)

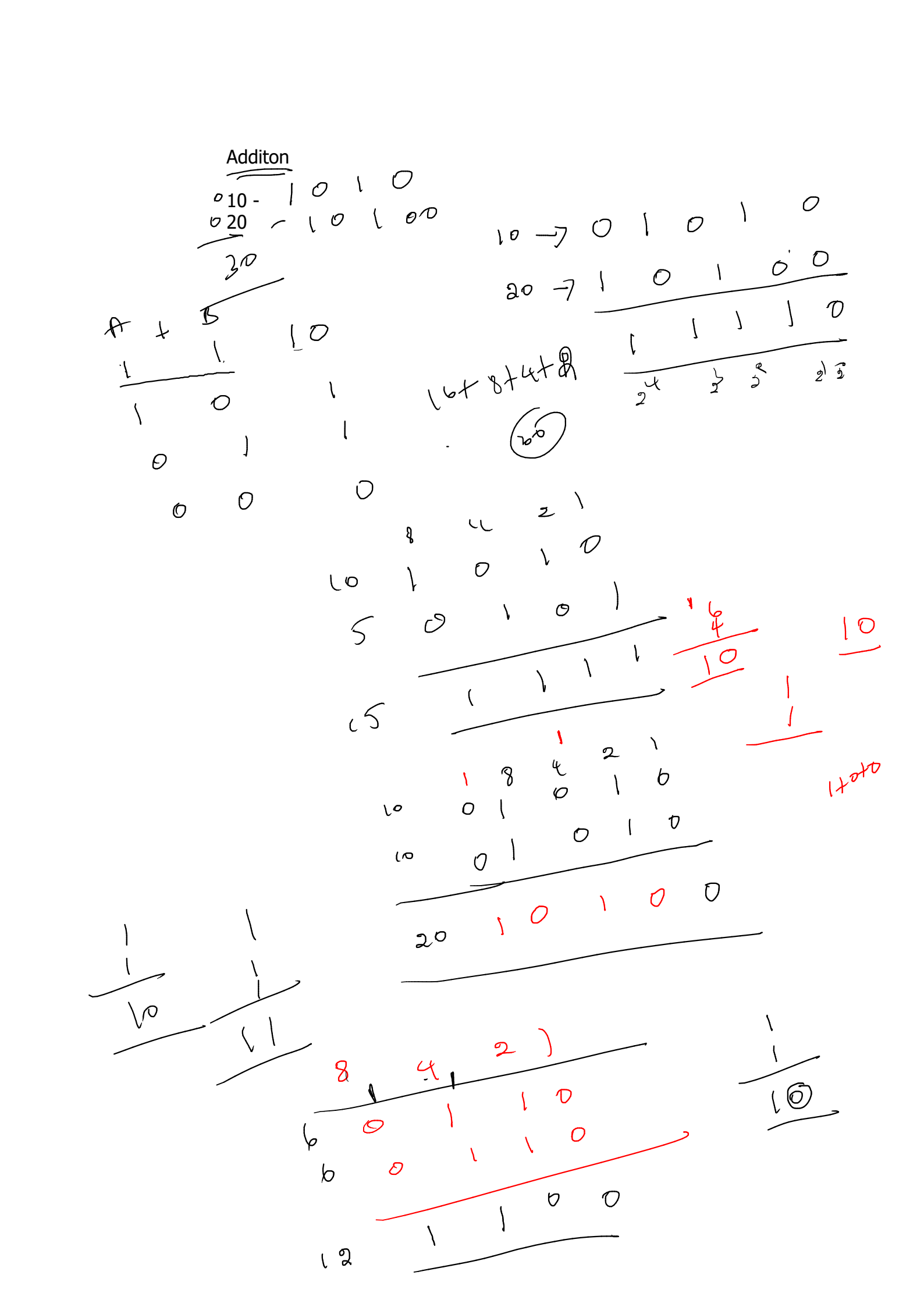
1. get ascii value(decimal) of A
2. convert this decimal to binary
3. store

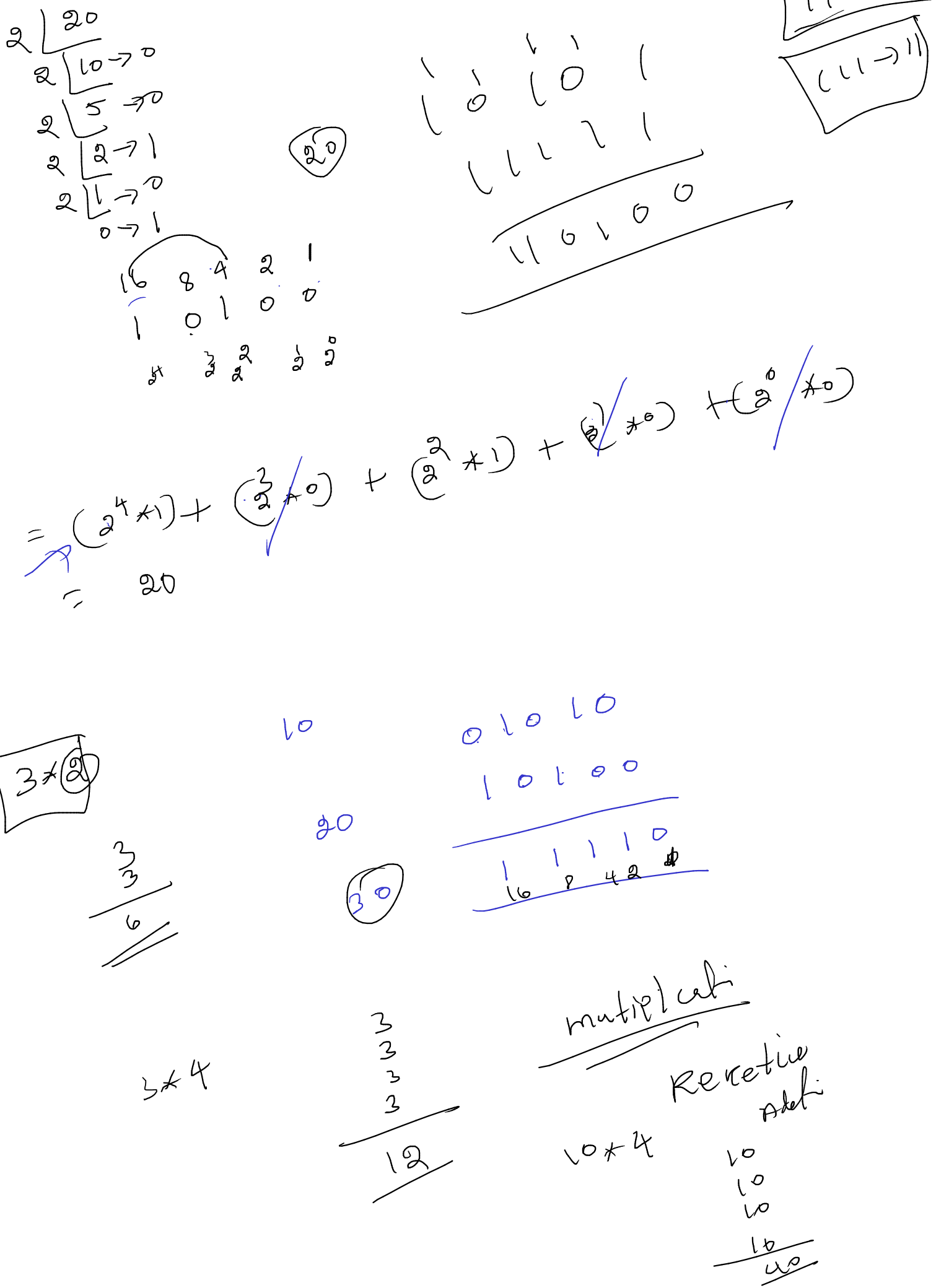
32 (Decimal to binary)

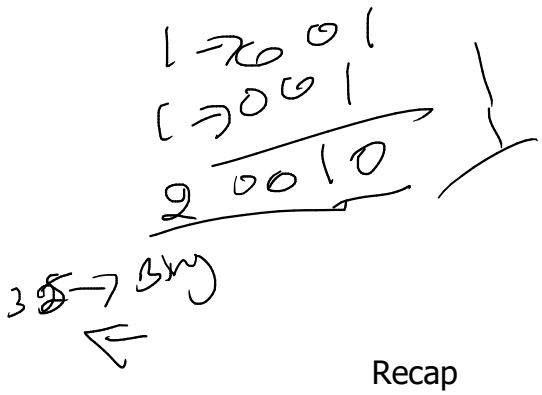
divide by 2

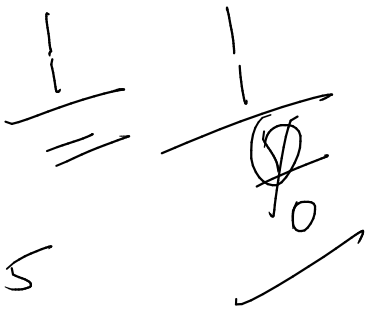
C A N
1000011 11000001 100110

Additon

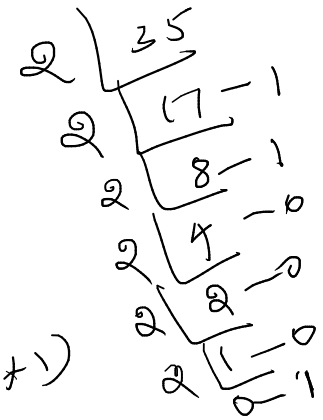


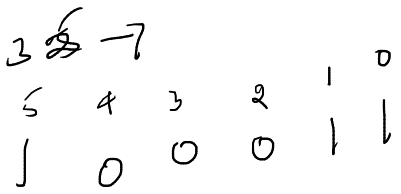

11 → 10
111 → 11
2 | 20
2 | 10 → 0
2 | 5 → 0
2 | 2 → 1
2 | 1 → 0
0 → 1
20
16 8 4 2 1
1 0 1 0 0
2^4 2^3 2^2 2^1 2^0
$= (2^4 * 1) + (2^3 * 0) + (2^2 * 1) + (2^1 * 0) + (2^0 * 0)$
$= 20$
3 * 2
6
10
20
30
0 1 0 1 0
1 0 1 0 0
1 1 1 1 0
16 8 4 2
3 * 4
12
multiplication
Recursive
10 * 4
40

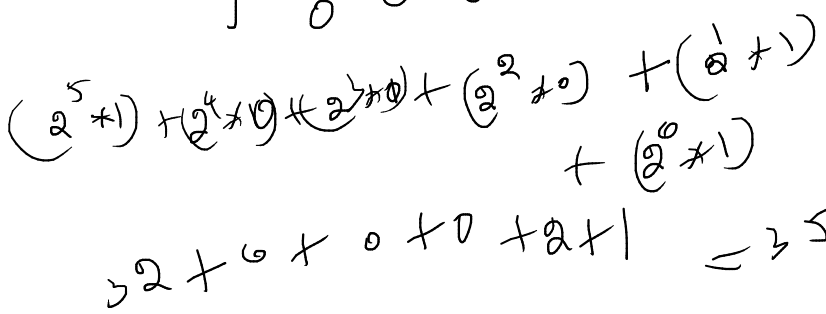




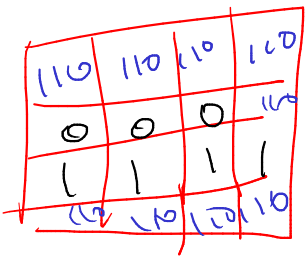
Recap
1. computer
2. 1/0 -> binary







0 → black
1 → white
110 → yellow



data stored in computer
1/0

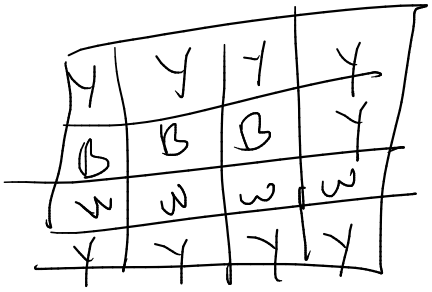
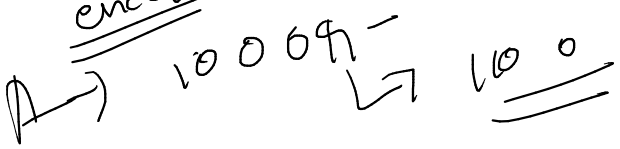
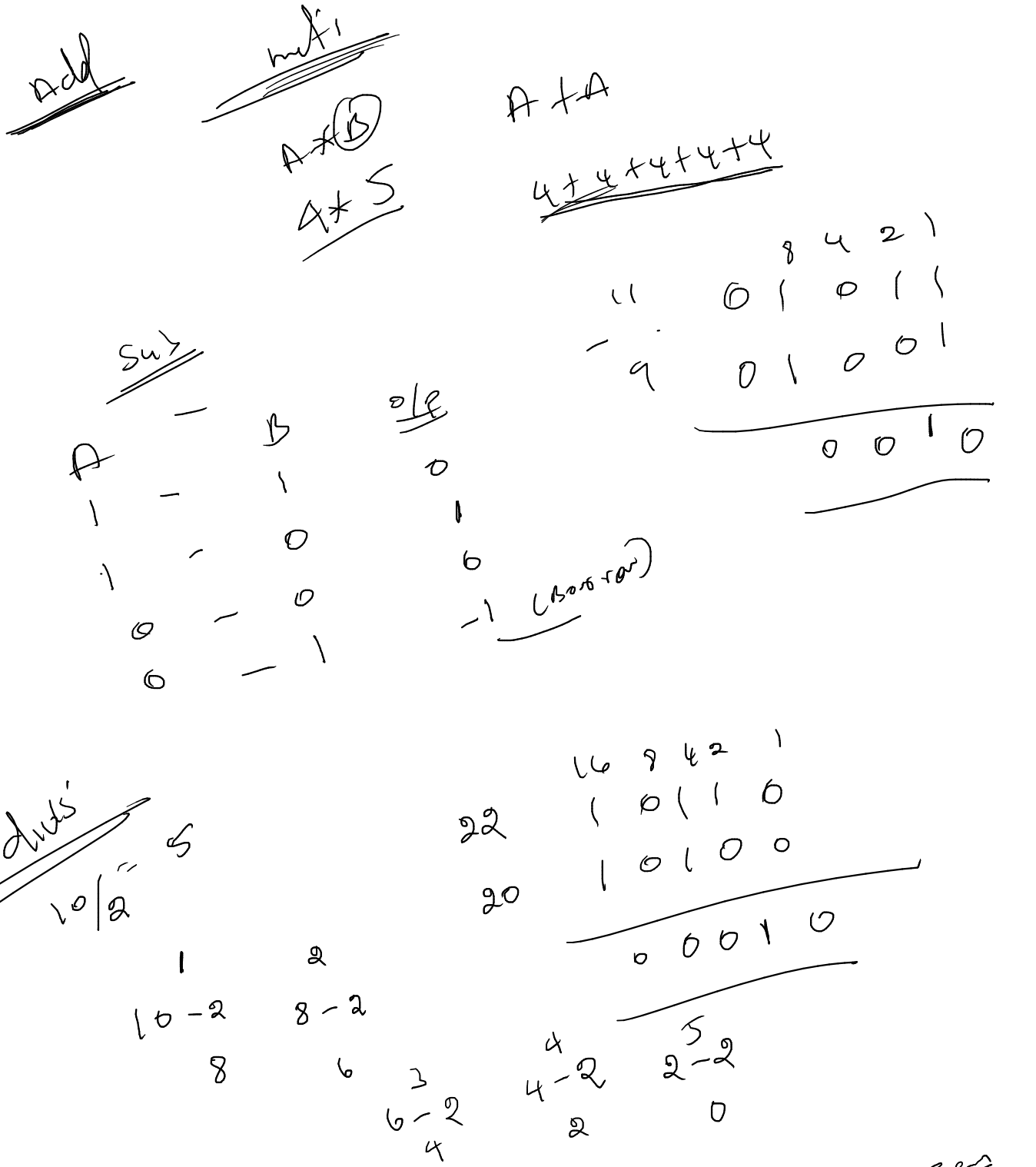


image -> 1/0

48FPS

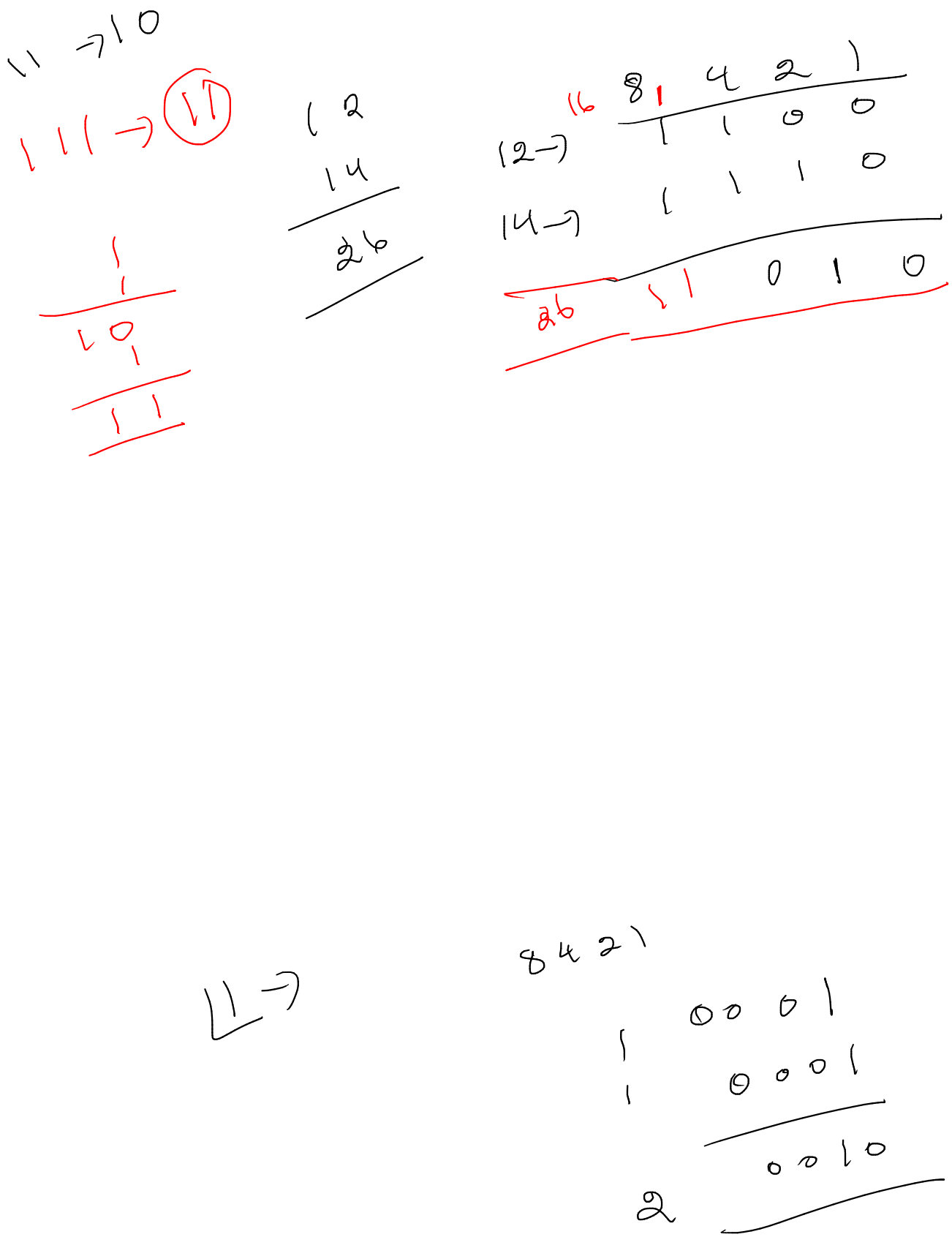
encode





addition -> adddding
subraction -> sub

multiplication -> reptive addition
division -> reptive subraction



Adding two numbers

algorithm for adding two numbers

1. start
2. input num1 and num2
3. do addition and store it ans. ans = num1+num2
4. output the ans
5. stop

psudocode
1. start
2. input num1, num2
3. ans = num1+num2;
4. output ans
5. stop