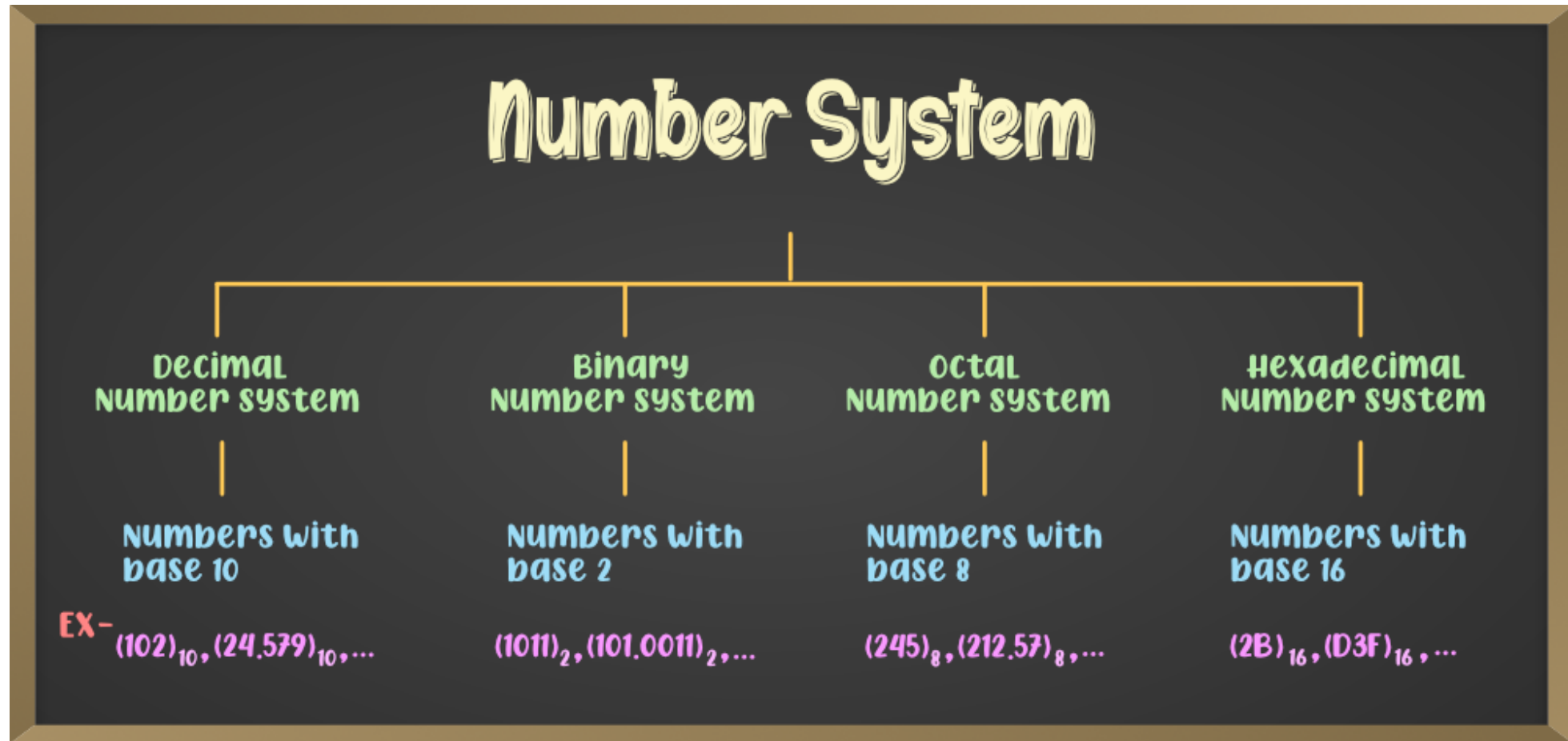


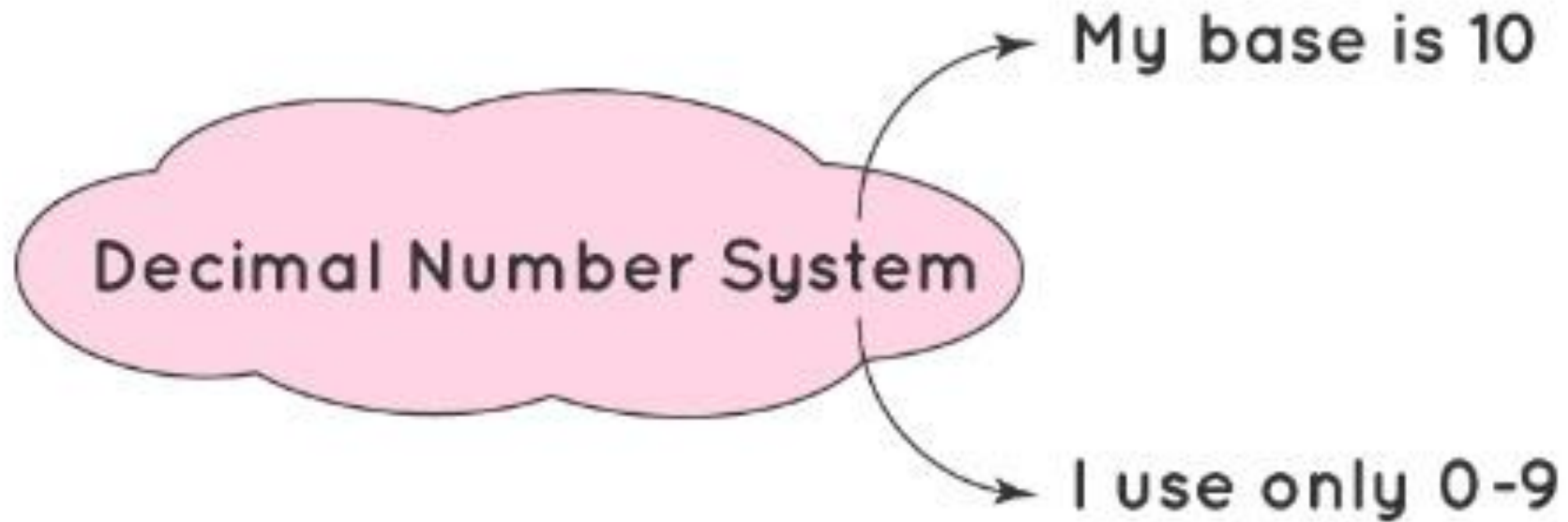
An isometric illustration of a workspace. A silver laptop is open on a dark blue desk, displaying lines of colorful code (blue, yellow, red, and grey) on its screen. To the left of the laptop is a clear glass filled with blue liquid. The background is a solid red color.

Numbering System

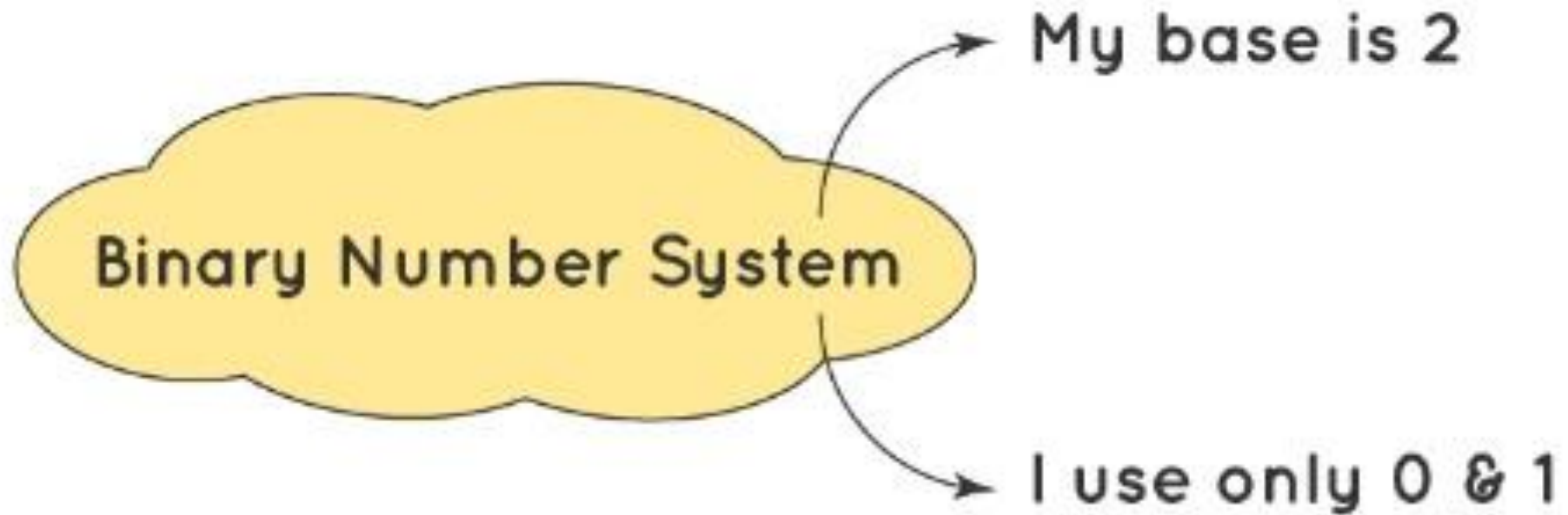
Understand the decimal , binary, octal and hexadecimal number systems.



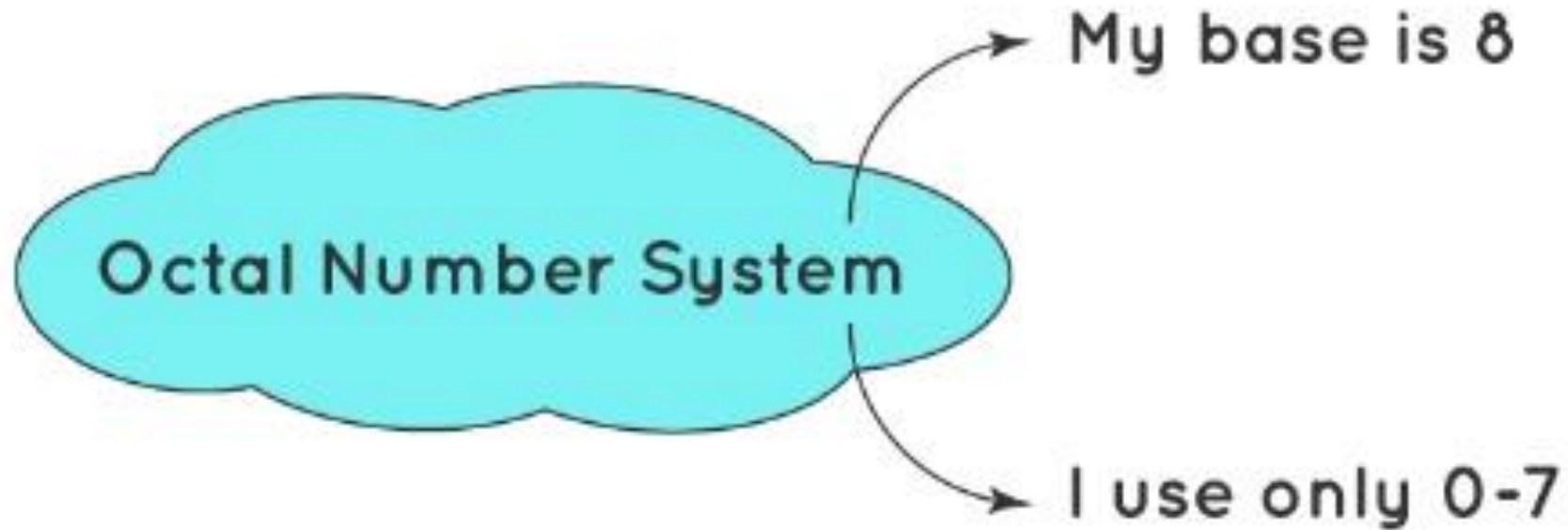
1- Decimal Number System



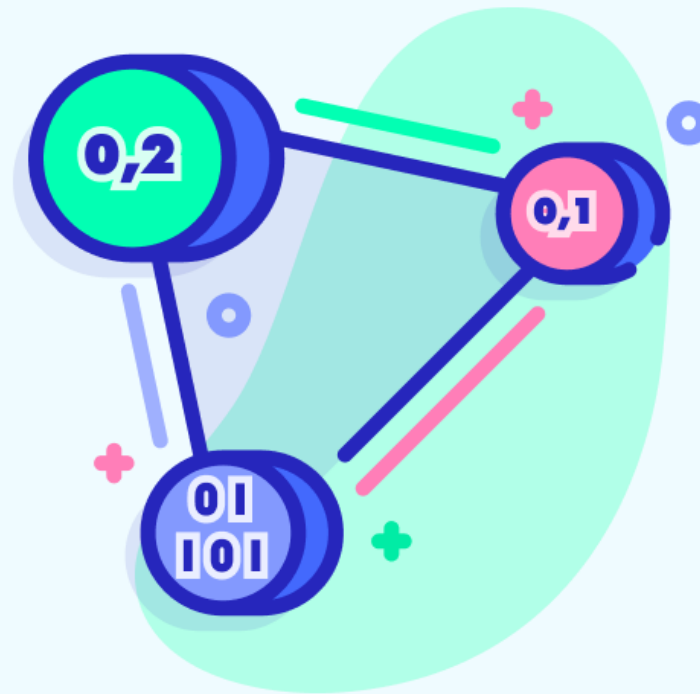
2- Binary Number System



3- Octal Number System



Convert from one number system into another.



1- Decimal to Binary Conversion

Decimal to Binary Conversion

$$(243)_{10} \longrightarrow (?)_2$$

2	243	1
2	121	1
2	60	0
2	30	0
2	15	1
2	7	1
2	3	1
	1	

$$\longrightarrow (11110011)_2$$

2- Decimal to Octal Conversion

Decimal to Octal Conversion

$$(243)_{10} \longrightarrow (?)_8$$

8	243	3
8	30	6
	3	

↑

→

 $\longrightarrow (363)_8$

3- Decimal to Hexadecimal Conversion

Decimal to Hexadecimal Conversion

$$(243)_{10} \longrightarrow (?)_{16}$$

16	243	3
	15	

$$\longrightarrow (15\ 3)_{16} \longrightarrow (F3)_{16}$$

4- Binary to Decimal Conversion

Binary to Decimal Conversion

$$(11101011)_2 \longrightarrow (?)_{10}$$

$$1 \times 2^7 + 1 \times 2^6 + 1 \times 2^5 + 0 \times 2^4 + 1 \times 2^3 + 0 \times 2^2 + 1 \times 2^1 + 1 \times 2^0$$

$$128 + 64 + 32 + 0 + 8 + 0 + 2 + 1$$

$$(235)_{10}$$

5- Binary to Octal Conversion

Binary to Octal Conversion

$$(11101011)_2 \longrightarrow (?)_8$$

$$\begin{array}{ccc} \textcolor{red}{0}11 & 101 & 011 \\ \downarrow & \downarrow & \downarrow \\ 3 & 5 & 3 \end{array} \longrightarrow (353)_8$$

6- Binary to Hexadecimal Conversion

Decimal to Binary Conversion

$$(243)_{10} \longrightarrow (?)_2$$

2	243	1
2	121	1
2	60	0
2	30	0
2	15	1
2	7	1
2	3	1
	1	

$$\longrightarrow (11110011)_2$$

7- Octal to Decimal Conversion

Octal to Decimal Conversion

$$(247)_8 \longrightarrow (?)_{10}$$

$$2 \times 8^2 + 4 \times 8^1 + 7 \times 8^0$$

$$2 \times 64 + 4 \times 8 + 7$$

$$128 + 32 + 7$$

$$(167)_{10}$$

8- Octal to Binary Conversion

Octal to Binary Conversion

$(247)_8 \longrightarrow (?)_2$

$\begin{array}{ccc} \boxed{2} & \boxed{4} & \boxed{7} \\ \downarrow & \downarrow & \downarrow \end{array}$

$010 \quad 100 \quad 111 \longrightarrow \text{equivalent binary bits}$

$\longrightarrow (01010011)_2$

10- Hexadecimal to Binary Conversion

Hexadecimal to Binary Conversion

$(B2E)_{16} \longrightarrow (?)_2$

$\begin{array}{|c|} \hline B \\ \hline \end{array}$ $\begin{array}{|c|} \hline 2 \\ \hline \end{array}$ $\begin{array}{|c|} \hline E \\ \hline \end{array}$



11

2

14



Equivalent decimal
value



1011

0010

1110



Equivalent binary
bits

→ $(101100101110)_2$

11- Hexadecimal to Decimal Conversion

Hexadecimal to Decimal Conversion

$$(8EB4)_{16} \longrightarrow (?)_{10}$$

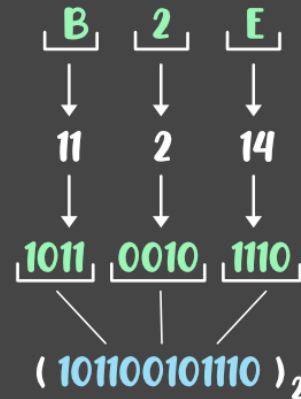
$$\begin{array}{r} 8 \quad 14 \quad 11 \quad 4 \\ 8 \times 16^3 + 14 \times 16^2 + 11 \times 16^1 + 4 \times 16^0 \\ 32768 + 3584 + 176 + 4 \\ (36532)_{10} \end{array}$$

12- Hexadecimal to Octal Conversion

Hexadecimal to Octal Conversion

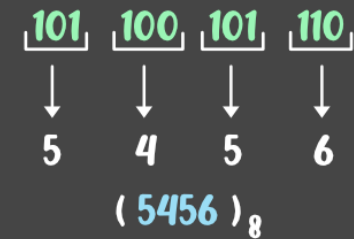
Hexadecimal to Binary

$(B2E)_{16} \longrightarrow (?)_8$



Binary to Octal

$(101100101110)_2$

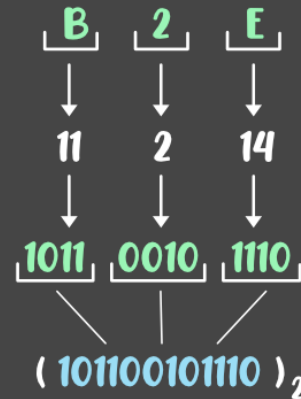


12- Hexadecimal to Octal Conversion

Hexadecimal to Octal Conversion

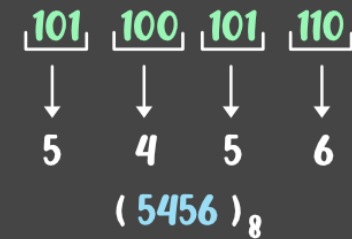
Hexadecimal to Binary

$(B2E)_{16} \longrightarrow (?)_8$



Binary to Octal

$(101100101110)_2$



Apply arithmetic operations to binary numbers.



1-Binary Addition

Binary Number 1	Binary Number 2	Addition	Carry
0	0	0	0
1	0	1	0
0	1	1	0
1	1	0	1

2-Binary Subtraction

Binary Number 1	Binary Number 2	Subtraction	Borrow
0	0	0	0
1	0	1	0
0	1	1	1
1	1	0	0

Text in Binary

A → 1000001

B → 1000010

ASCII Table

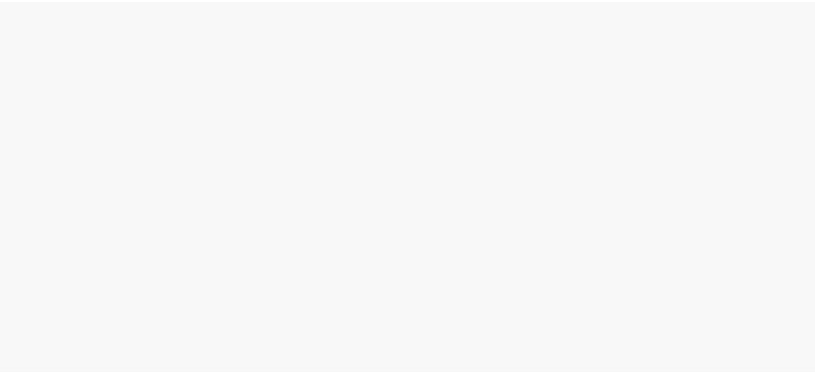
[illegible]

01001000
01000101
01001100
01001100
01001111

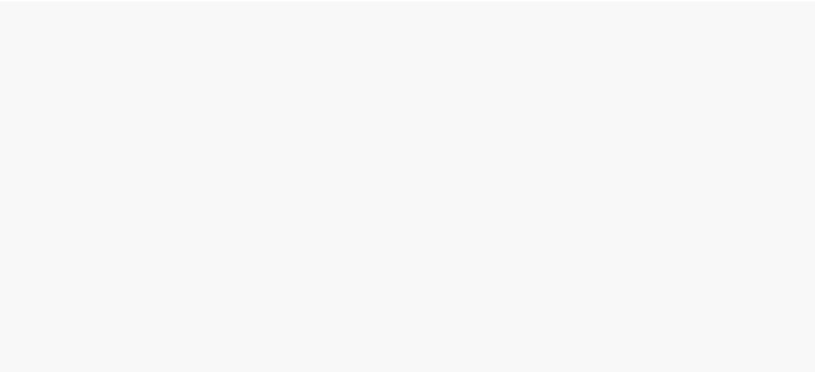
01010111
01001111
01010010
01001100
01000100

[HELLO WORLD]

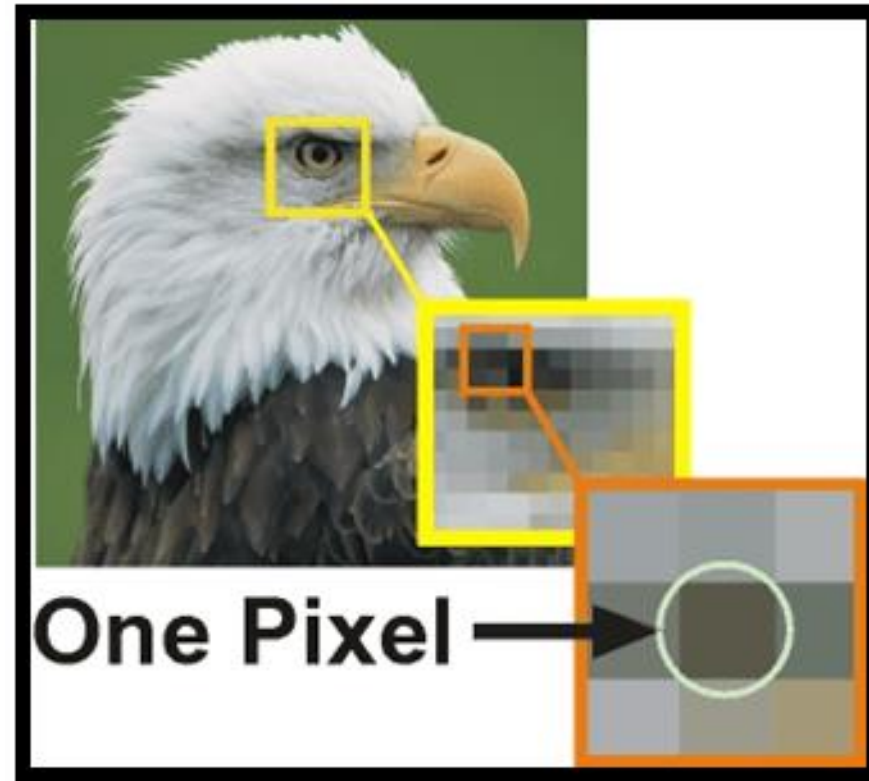
hi! In Binary


















01101000
01101001

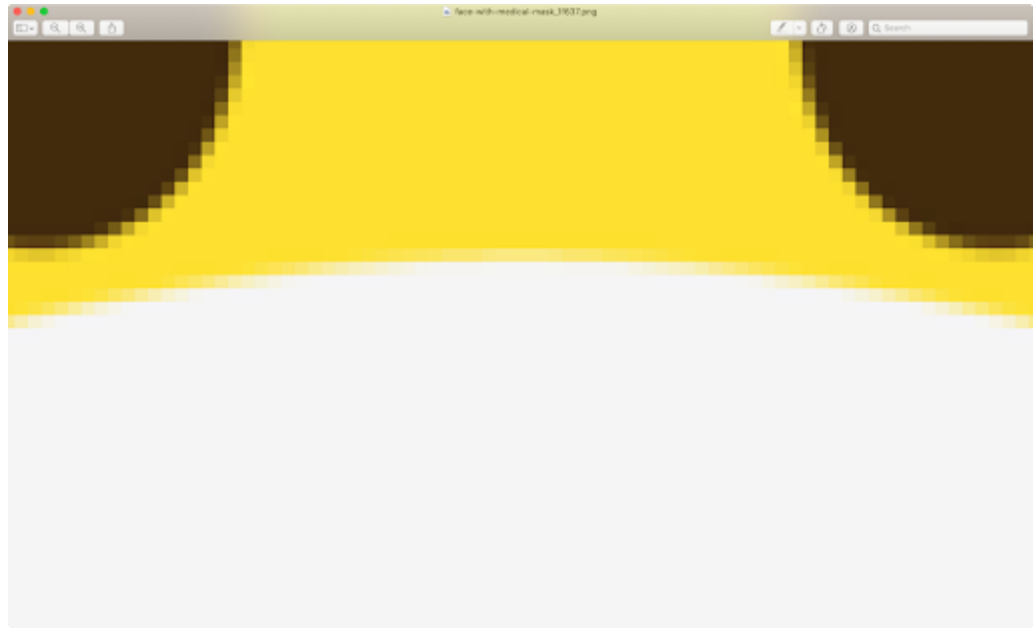


Images Making

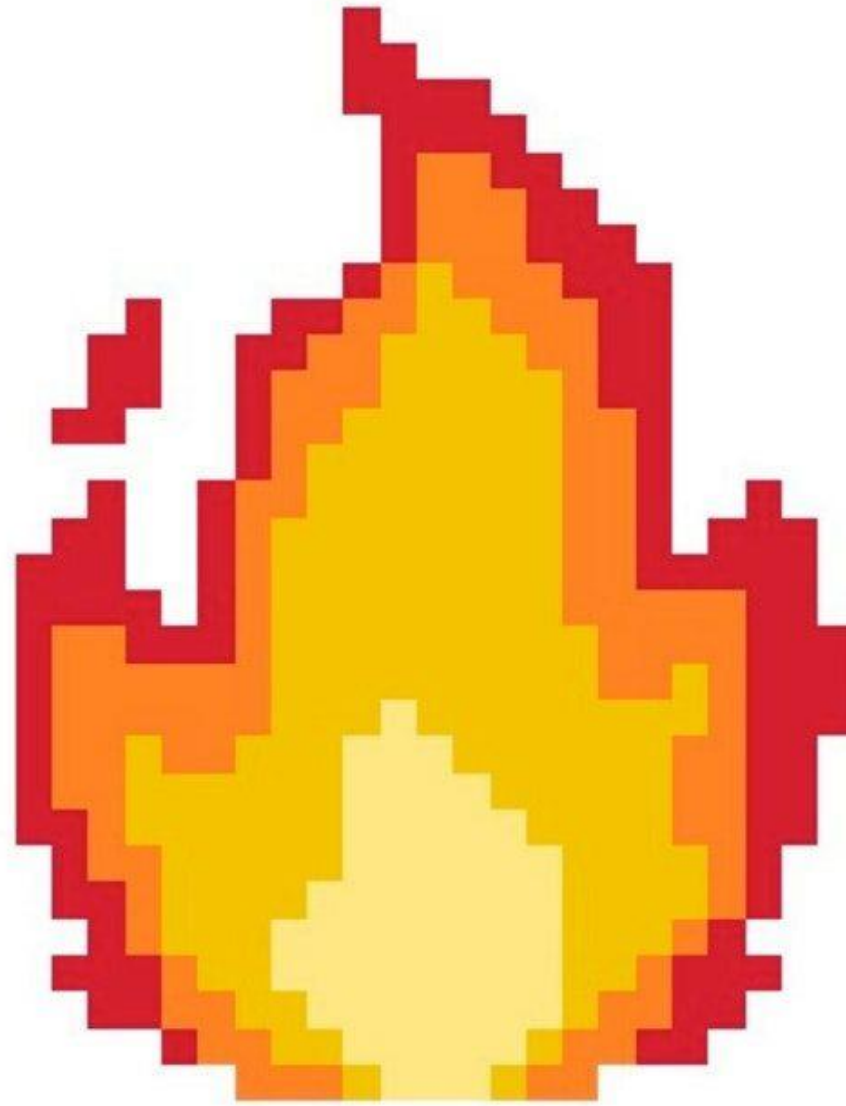


Colors In Hexadecimal Code

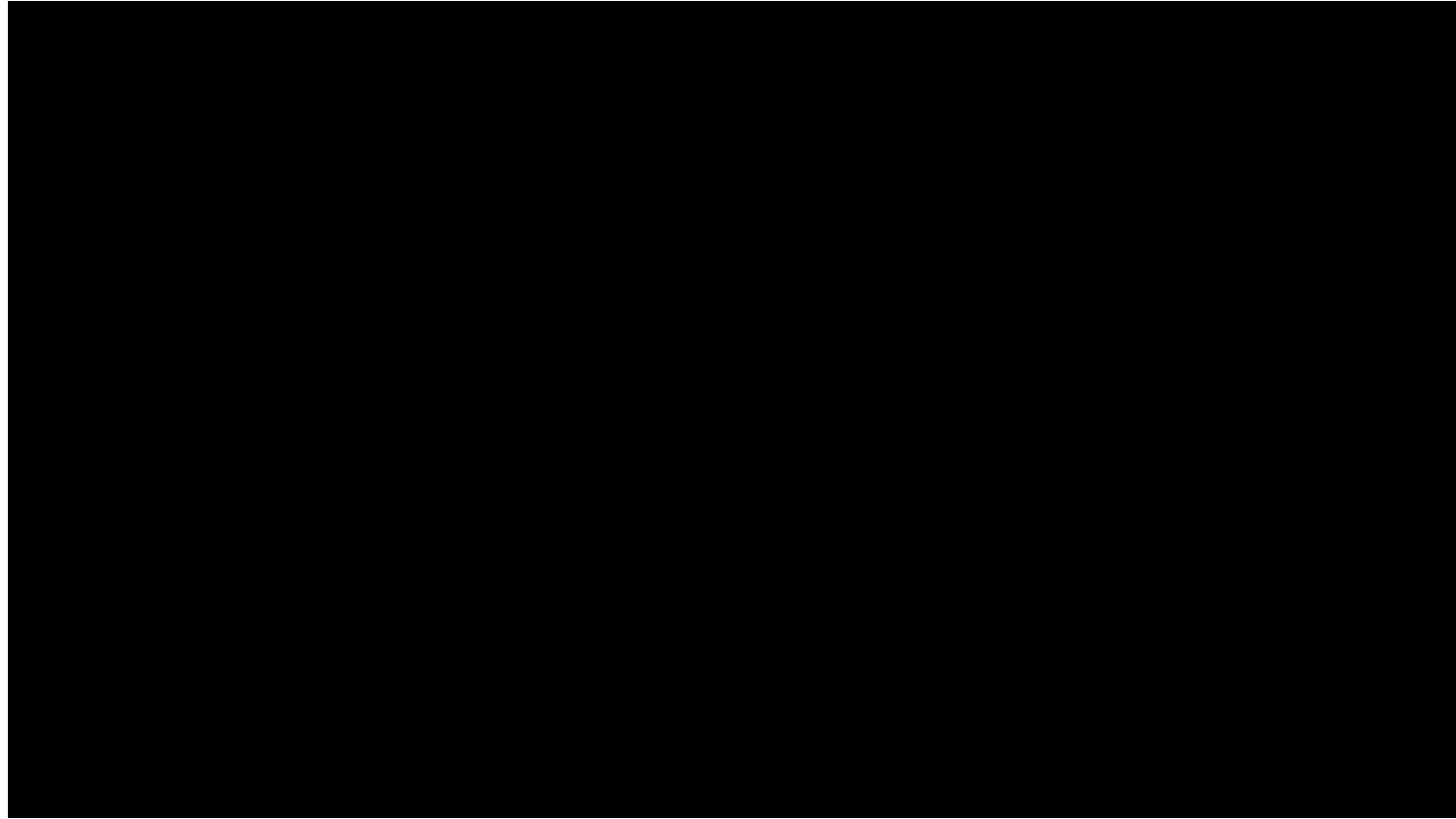
E63946			
F1FAEE			
A8DADC			
457B9D			
1D3557			



Images Contains Pixels



Video Making





**Thank You
So Much!**