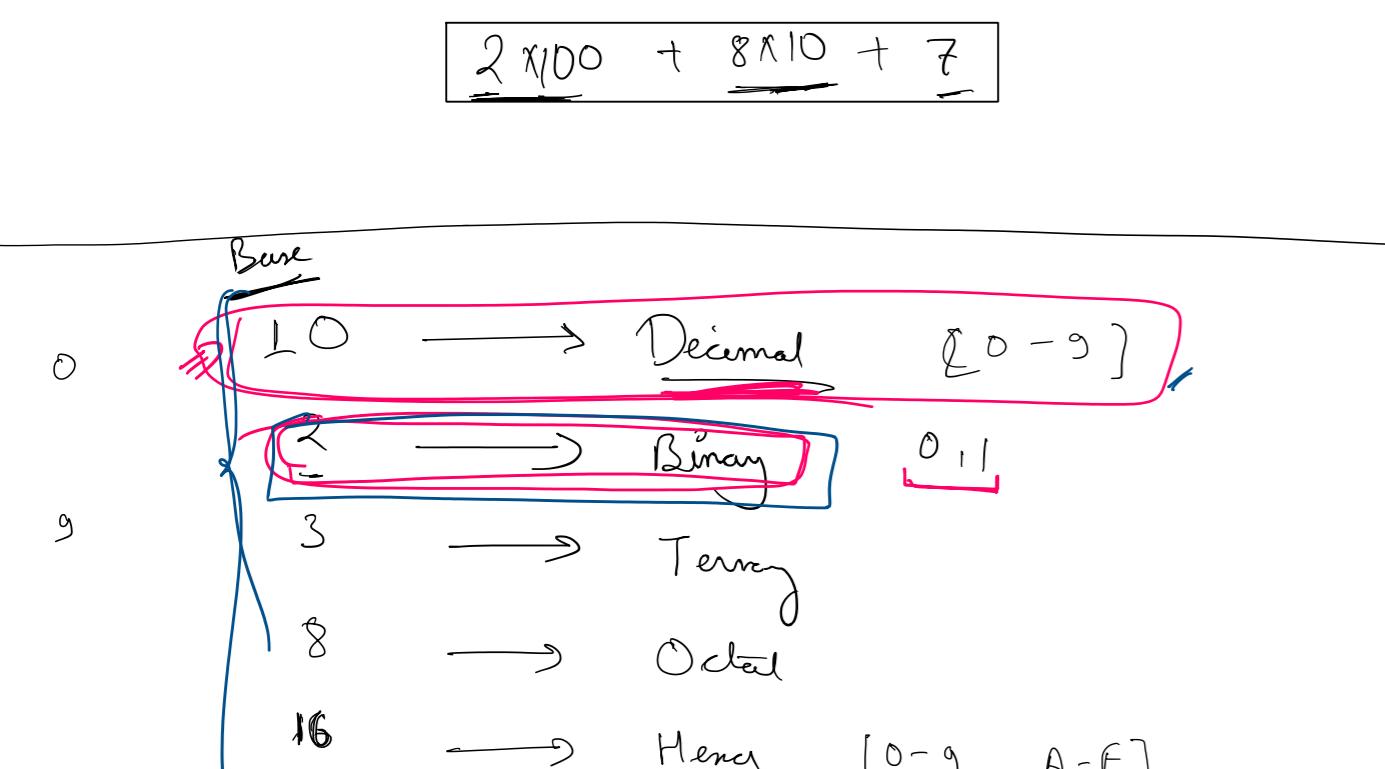
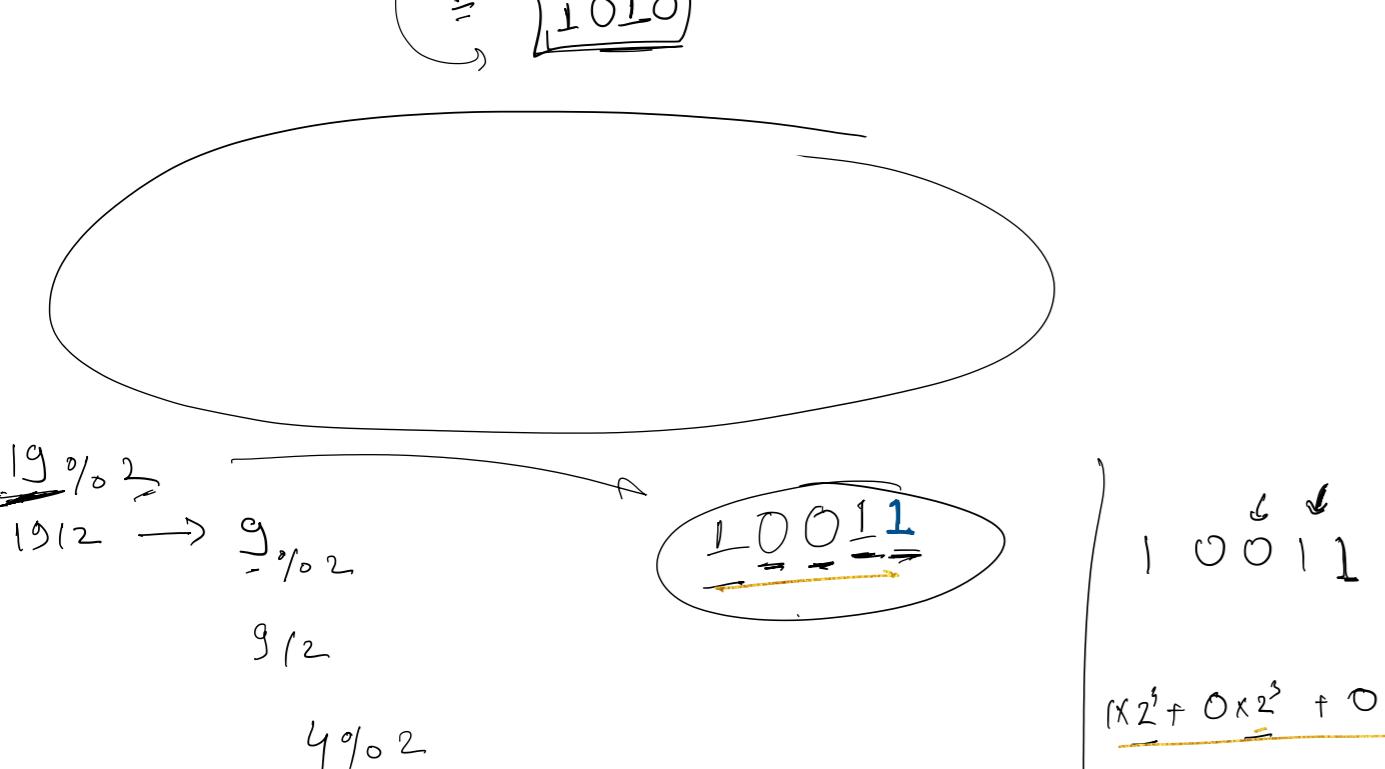


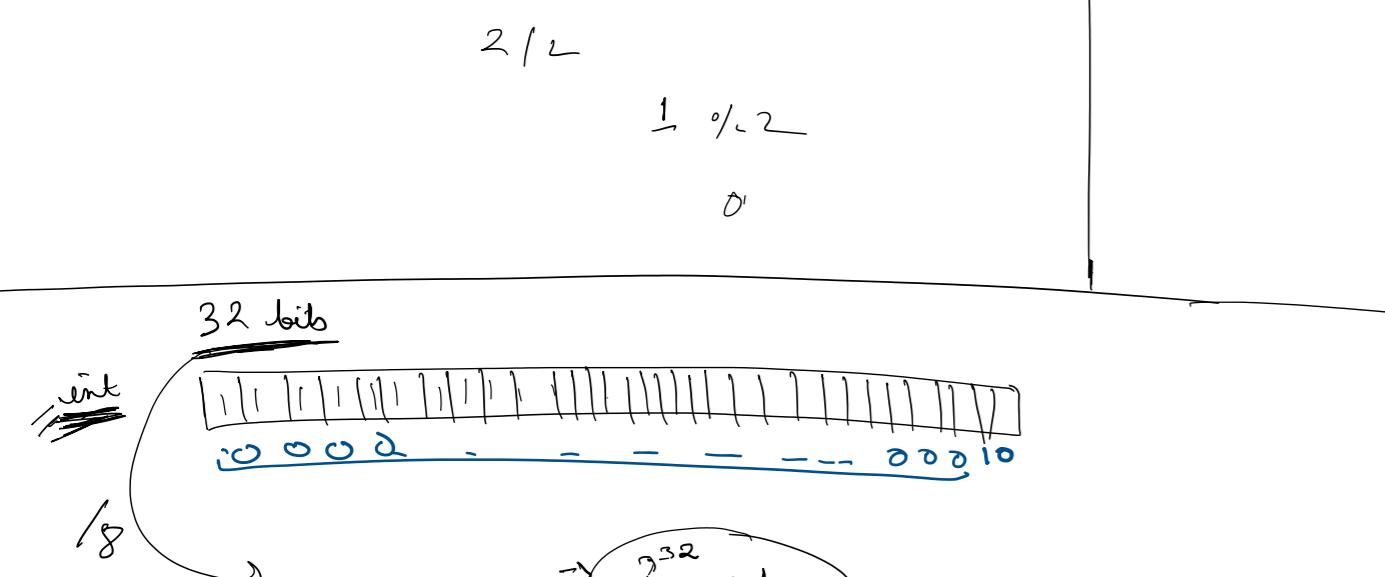
100



The diagram consists of two parts. The top part shows a graph with a blue curve and a red line. The vertical axis has labels 1, 2, 3, 4, 5, 6, 7, 8, 9. The horizontal axis has a single tick mark. A blue line starts at the origin, goes up to a peak, then down to a trough, and ends at the tick mark. A red line starts at the origin, goes up to a peak, then turns sharply downwards to meet the blue line at its trough. The bottom part shows the text "Villkanord" underlined on the left, followed by an arrow pointing to "Virreas mör -" underlined on the right. To the left of the first underlined word is a circle containing "(0,1)". Below this, there is a branching structure: a line from the circle leads to a box labeled "10", which then branches into two arrows pointing to two circles, each containing a pair of numbers (e.g., "6 6" and "5 5"). Another line from the circle leads to a box labeled "5", which branches into two arrows pointing to two circles, each containing a pair of numbers (e.g., "6 6" and "5 5"). A third line from the circle leads to a box labeled "2", which branches into two arrows pointing to two circles, each containing a pair of numbers (e.g., "6 6" and "5 5").



4/2



~~4 byte~~ $\rightarrow 2^4 - 1$

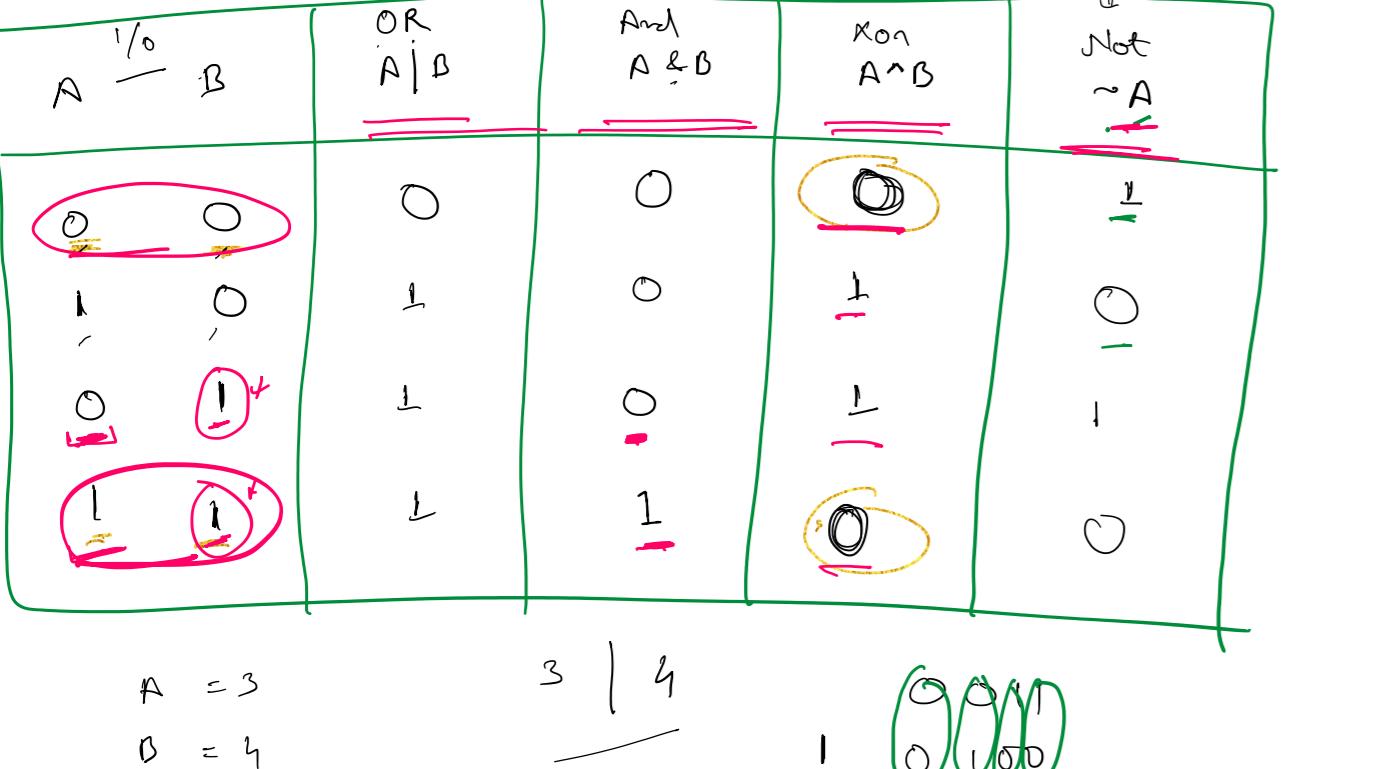
$$\begin{array}{r} 1 \quad 1 \quad 1 \quad 1 \\ 2^3 + 2^2 + 2^1 + 2^0 \\ \hline \text{GP} \end{array} \Rightarrow 15 \quad (2^4 - 1)$$

$$\sum_{k=0}^{n-1} a \times (r^n - 1) / (r - 1)$$

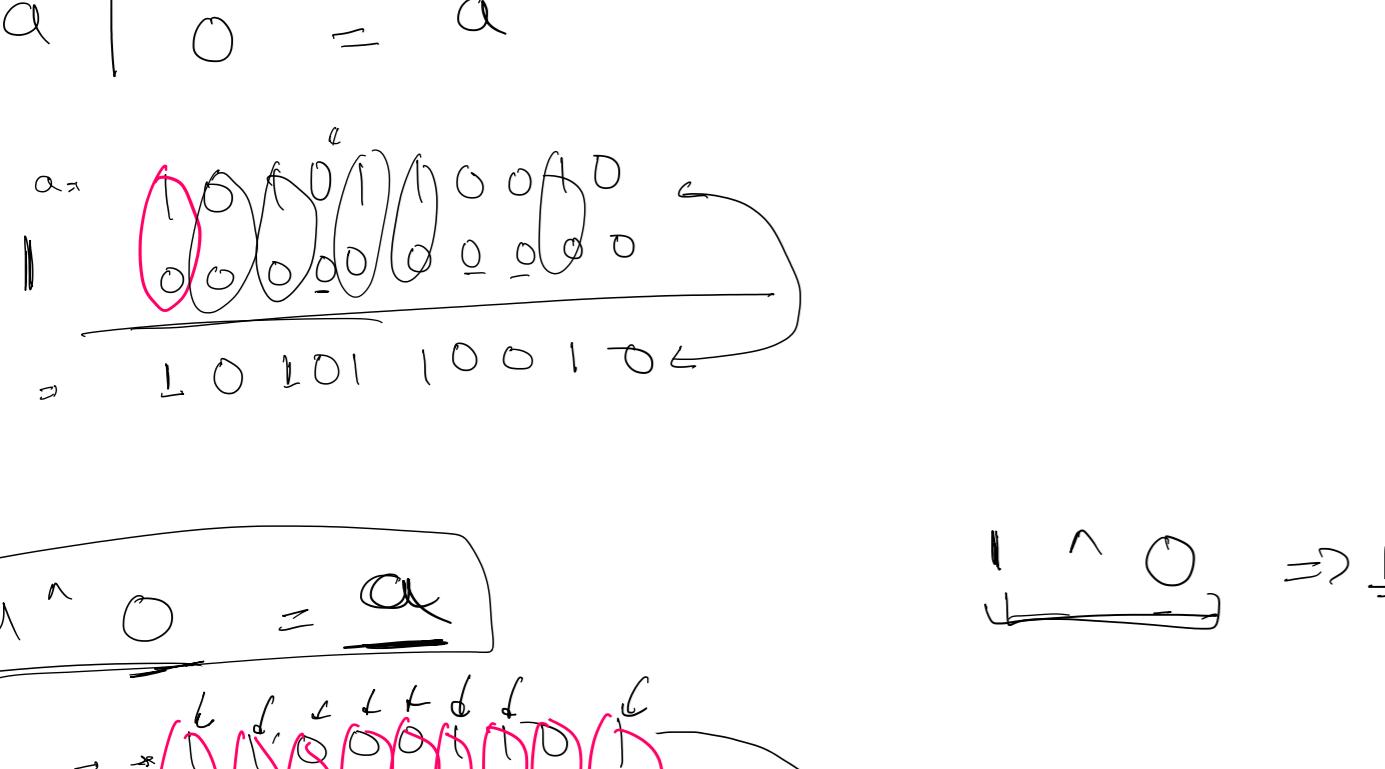
$r = 2$
 $a = 1$
 $n = 4$

wise Operation

$0 \Rightarrow 0$ 1001001
 $1 \rightarrow \text{SetBit}$
 $0 \rightarrow \text{Unset Bit}$



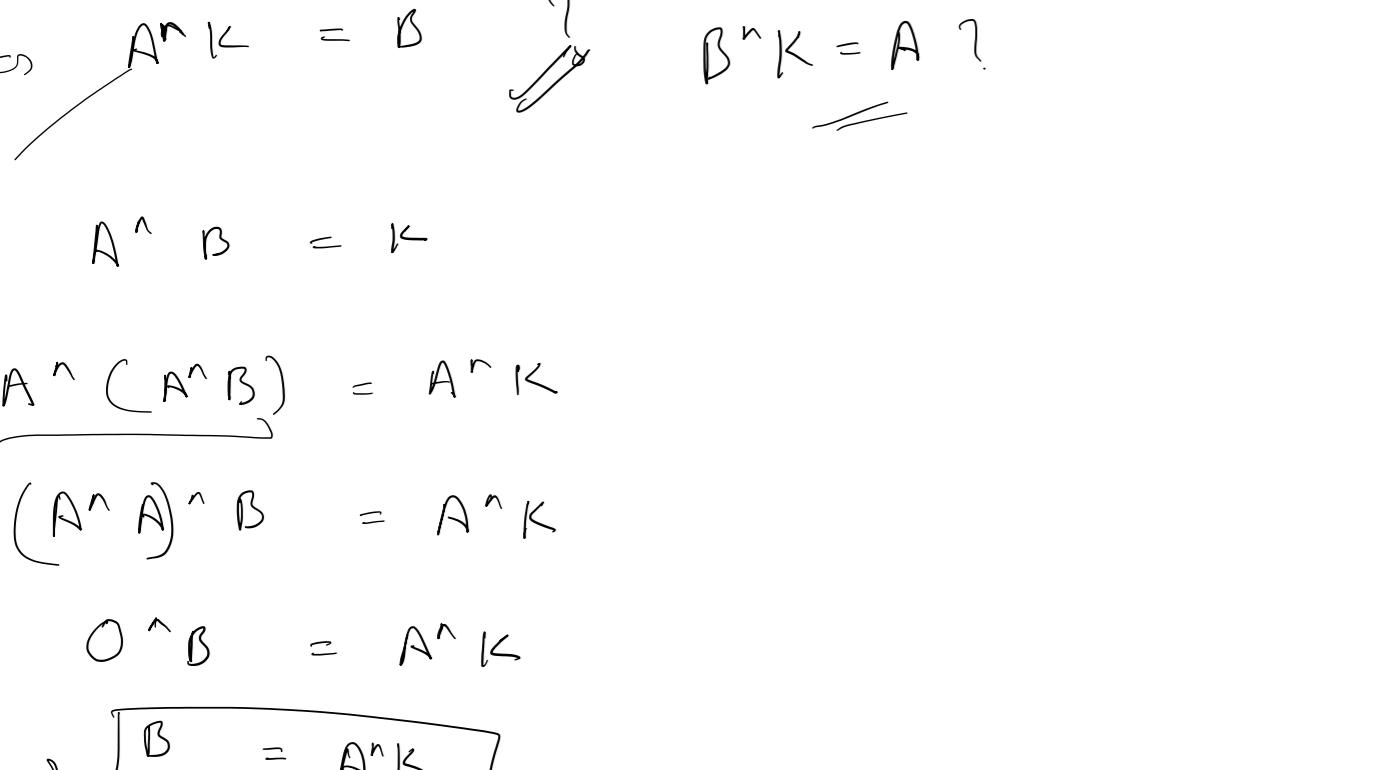
$$\begin{array}{r}
 & \overbrace{0\ 1\ 1\ 1}^{\Rightarrow 7} \\
 3 \& 4 & \swarrow & \begin{array}{r}
 & \overbrace{0\ 0\ 0\ 0\ 0\ 0}^{\Rightarrow 0} \\
 8 & \overbrace{0\ 1\ 0\ 0\ 0\ 0}^{\Rightarrow 0}
 \end{array} \\
 0 \& 0 = 0
 \end{array}$$



$$\overbrace{\text{Diagram showing } A^n \cap B \cap C = A^n (B^c)}$$

$$\overbrace{\text{Diagram showing } A^n B = B^n A}$$

$$A^n B = K$$



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Q Given an array where all no. appear twice except one number which occurs only once.

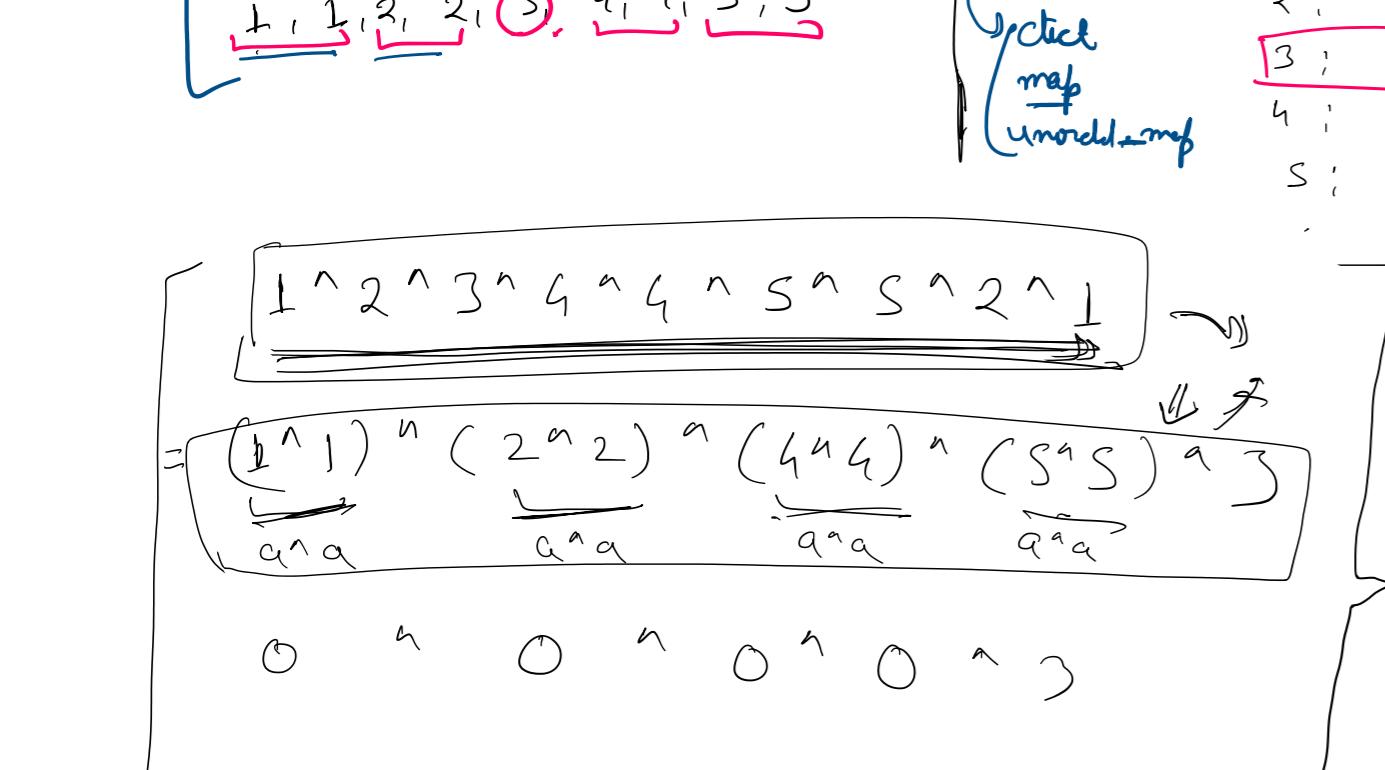
Find the single number.

A: $\left[\frac{1}{\cancel{1}}, \frac{2}{\cancel{2}}, \cancel{3}, \frac{4}{\cancel{4}}, \frac{4}{\cancel{4}}, \frac{5}{\cancel{5}}, \frac{5}{\cancel{5}}, \frac{6}{\cancel{6}} \right]$

Sort all no. $\Rightarrow O(n \log n)$

HashMap (Key, Val)

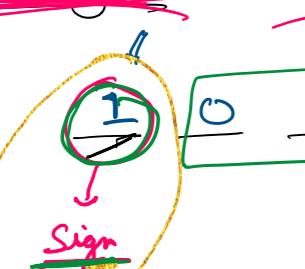
| | |
|-----|-----|
| Key | 1 : |
| 2 : | 3 : |
| 4 : | 5 : |
| 6 : | 7 : |



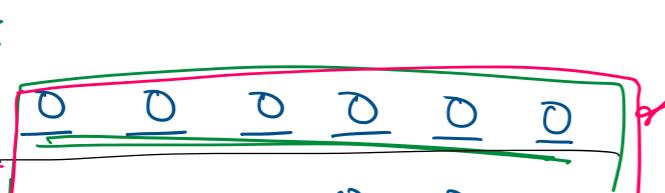
$\Rightarrow 0^3$

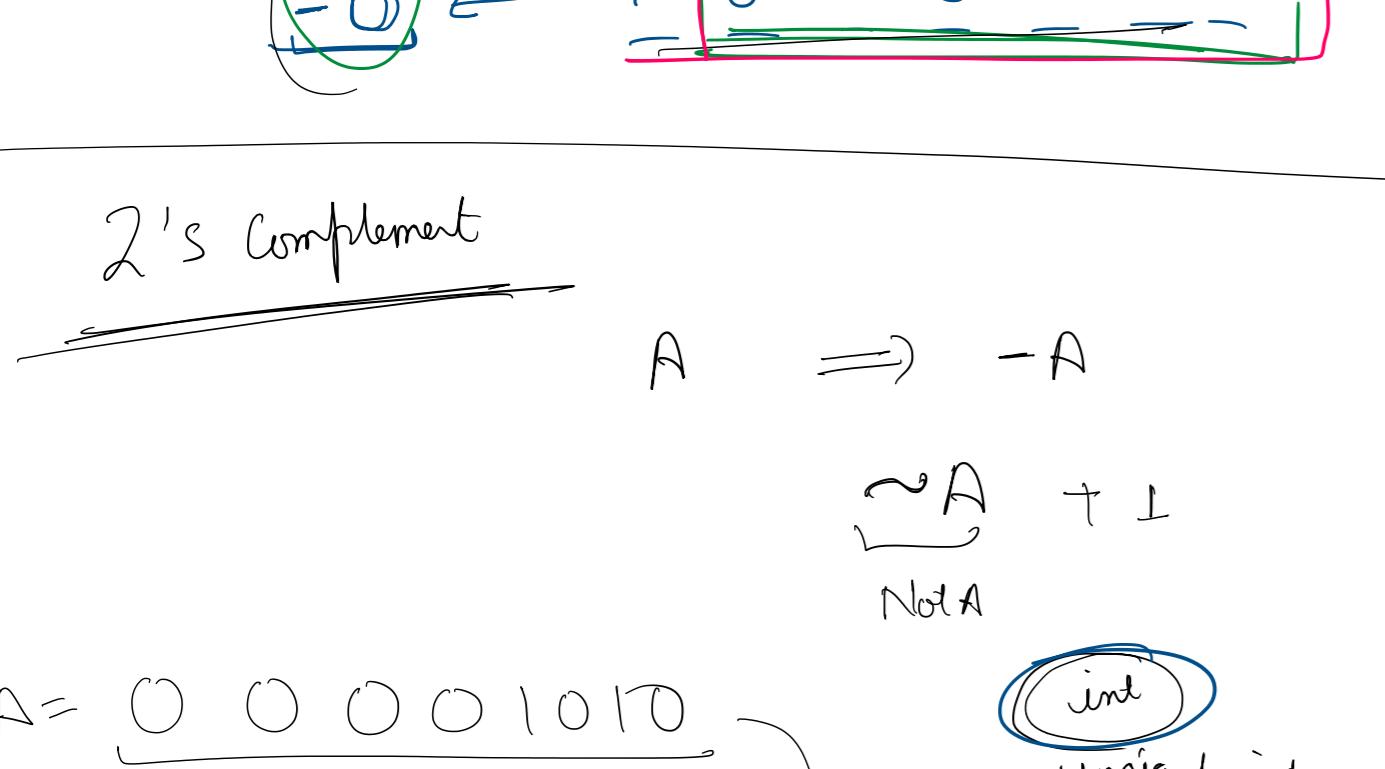
$= \underline{\underline{3}}$

Assumed 8 bit Data high

-10 \Rightarrow 

0 0 0 1 0 1 0





Ansager end

$$\sim A = \begin{array}{r} 1 \\ + 1 \\ \hline \end{array} \quad \begin{array}{r} 1 \\ | \\ 1 \\ | \\ 0 \\ | \\ 0 \\ | \\ \hline 1 \end{array}$$

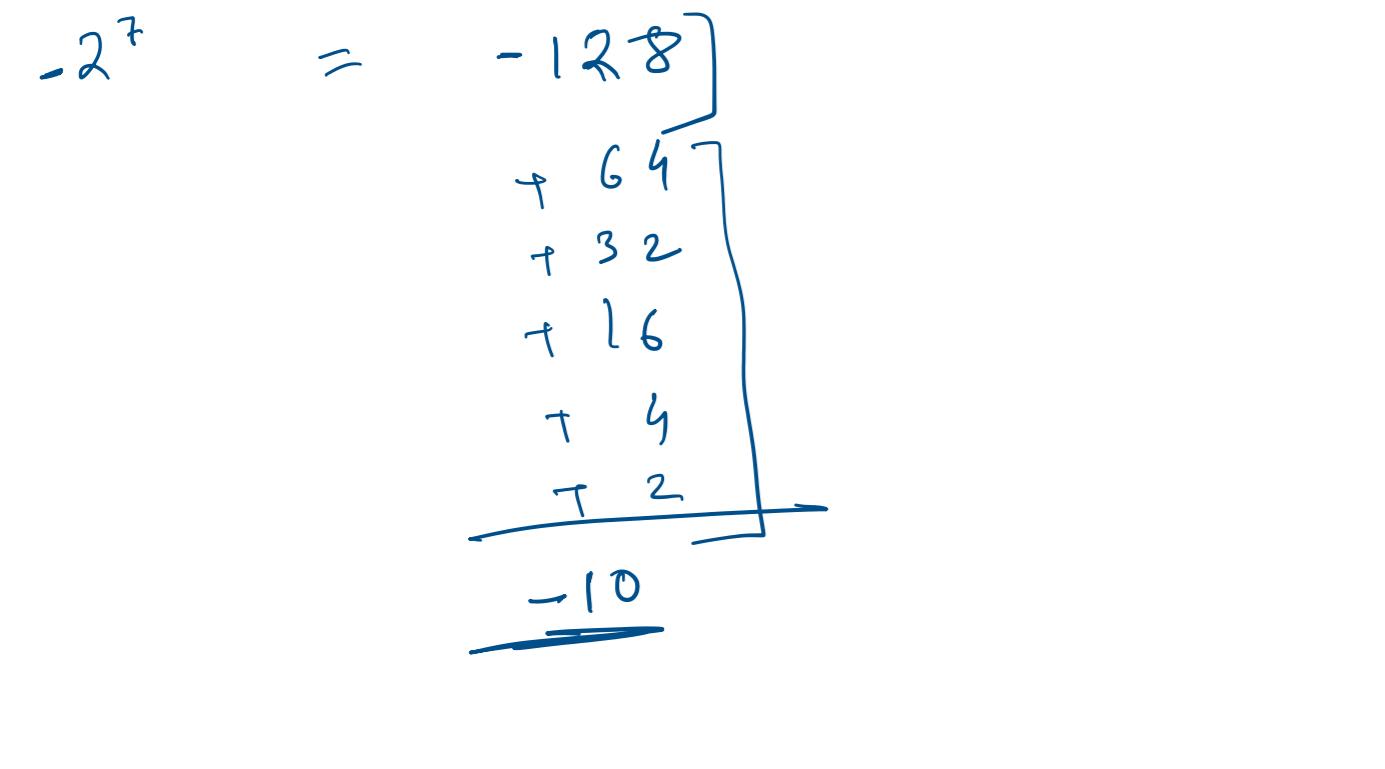
Binary Addition:

$$\begin{array}{r} 11110110 \\ + 110110 \\ \hline 1000110 \end{array}$$

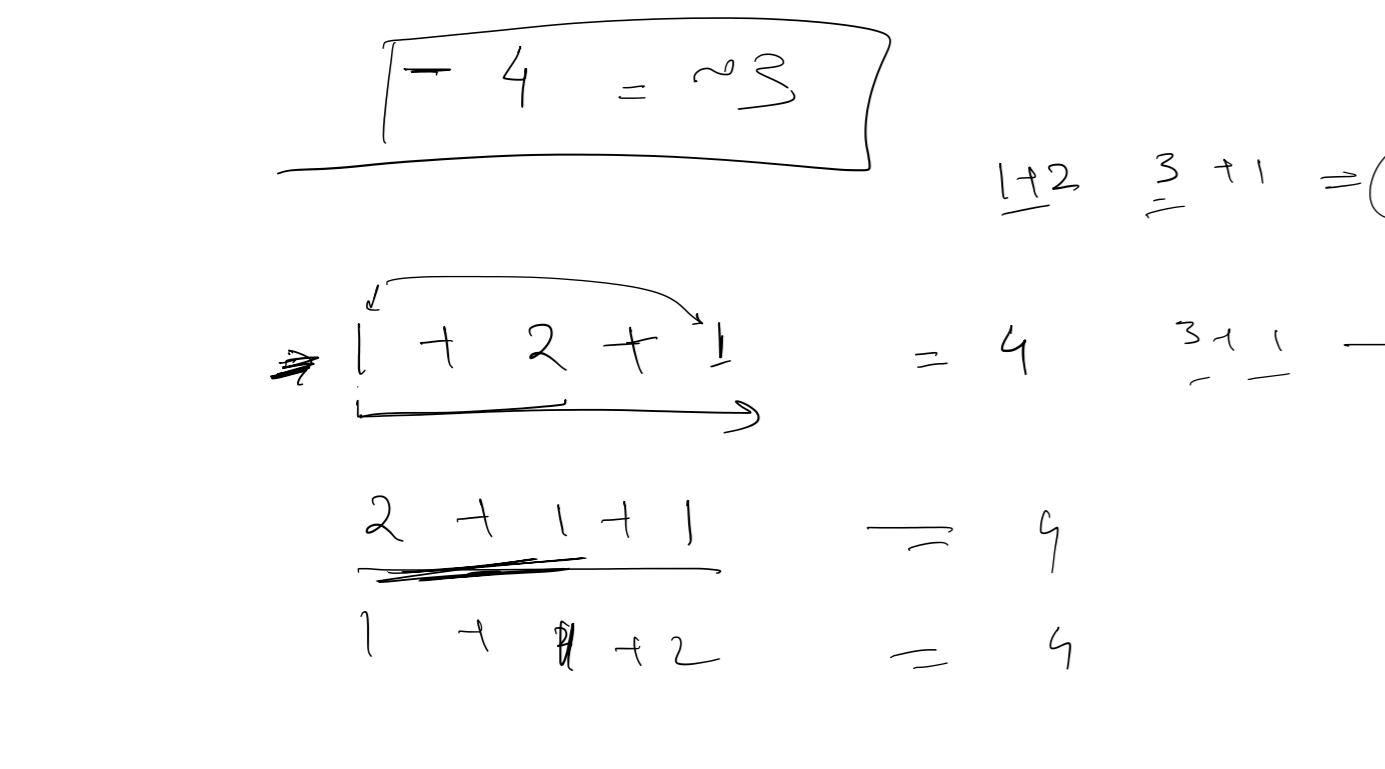
Binary Representation:

$$-1 \times 2^7 + 1 \times 2^6 + 1 \times 2^5 + 1 \times 2^4 + 0 \times 2^3 + \underline{1 \times 2^2} + 1 \times 2^1 + 1 \times 2^0 -$$

$$=$$



$$\begin{aligned}
 \text{int } a &= 3; \\
 \sim a &\Rightarrow \\
 \overbrace{\quad \underline{0} \quad \underline{0} \quad \underline{0} \quad \underline{0} \quad \underline{0} \quad \underline{0} \quad \dots \quad \underline{0} \quad}^{| \quad | \quad | \quad | \quad | \quad | \quad \cdots \quad | \quad 0} \\
 -A &= \sim A + \perp \\
 \Rightarrow -A - \perp &= \sim A
 \end{aligned}$$



① Given an array find first / last /
② Check if a given no. can be -