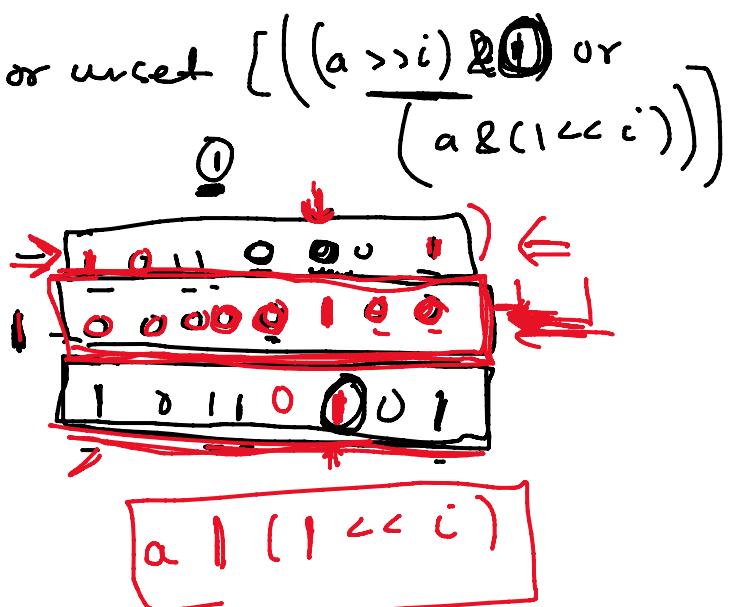
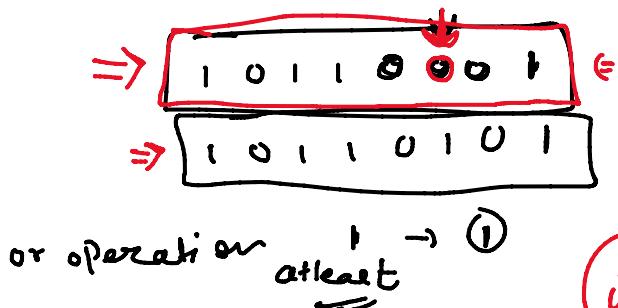


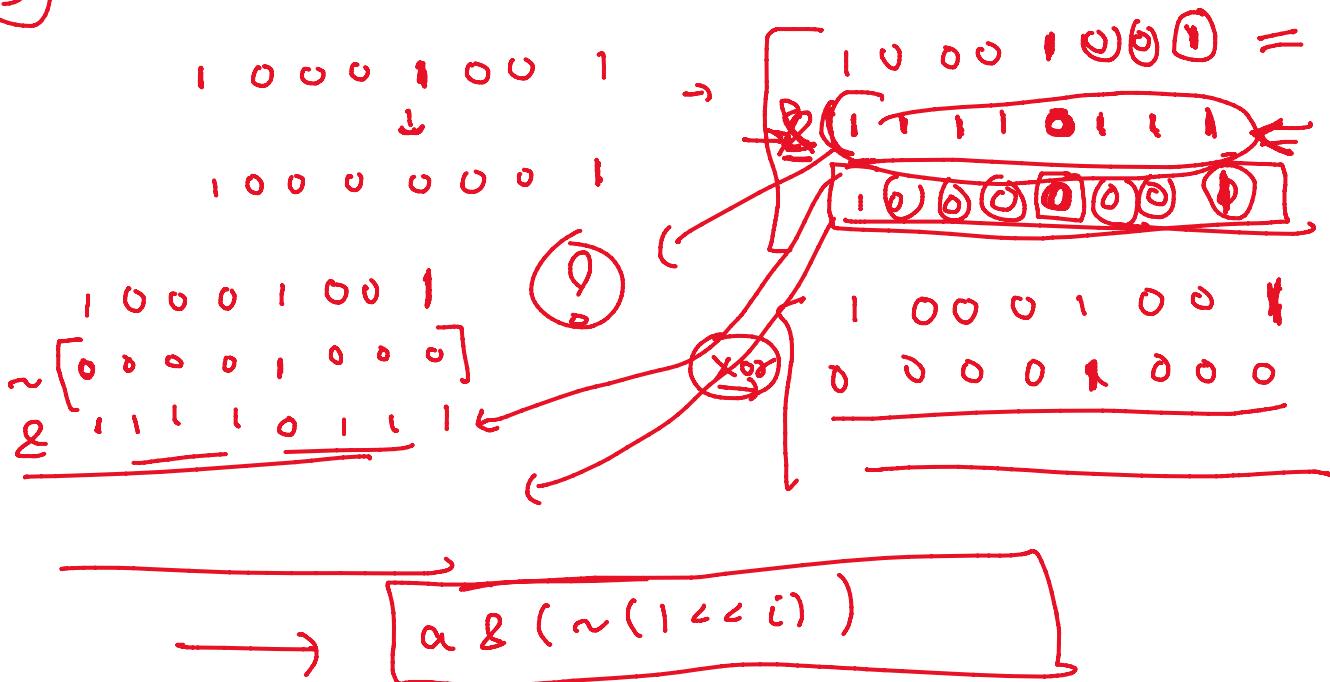
Class 42

- ① How to check if i^{th} bit is set or unset $\left[\left((a \gg i) \& 1 \right) \text{ or } \left(a \& (1 \ll i) \right) \right]$
 - ② How to set i^{th} bit



$$\begin{array}{r} \underline{10001} \\ 0 \\ \hline \end{array} \Rightarrow \underline{\underline{34}}$$

- ### ③ How to unset a bit

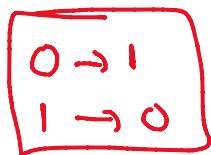


- ④ Toggle a bit

Q = 1

imbit toggle

in hit



in bit toggle

out bit

$$2^7 = 128$$

$$2^4 = \frac{16}{2}$$

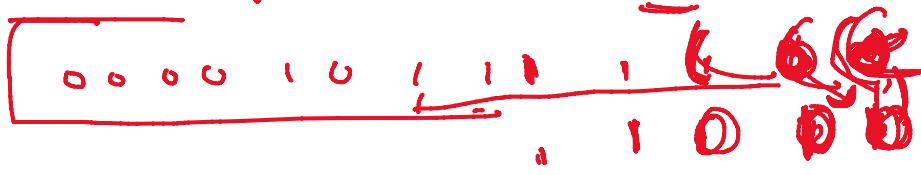
$$\begin{array}{r} 100000010 \\ \text{---} \\ 100000010 \end{array} \rightarrow$$



(5)

Total no of setbits in a No

(32)



8 - 30

30

even combination

OddNo + 1

~~6 + 5 + 1~~
7 → 6 + 1

$$\text{#bit} = 2^6 +$$

* if a No is even or odd

3 → 11
4 → 100
5 → 101

6 → 110
7 → 111
8 → 1000
" → 1011

$2^0 = 1$ (odd)

$2^1, 2^2, 2^3, \dots, 2^i$ (odd)

Odd = Even + Odd

Check whether 2^m bit is 1 or 0

101111
111

\oplus (n & 1)

1011110
 $\underline{\quad \quad}$
 b

$\leftarrow \nwarrow \leftarrow \searrow$
 $\leftarrow \nwarrow$
 $\leftarrow \searrow$

$$n = n \times 2;$$

$$\begin{array}{l} n \ll 1 \\ \hline n = n \times 2 \end{array}$$

Hori
 $(S + e) \Rightarrow (S + e) \gg 1$
 \rightarrow

$$n \gg 1$$

[Upper and lower case conversion]

$A \rightarrow a$
 \downarrow
 $65 \text{ F32} \quad 97$

[Bit manipulation]

Only 5th bit is different

$32 \rightarrow \text{character}$

'f' &

1000100
 $\underline{(1)0100000}$

$\text{1} \ll 5 \Rightarrow \& \text{character}$

$$-128 - 127$$

$\sim (010000)$

111111101111111

$\rightarrow 127$

Character

'F' 111

'f' 2

$00000000000000000000000000000000$
 $\sim \cancel{1100110}$
 $\underline{1011111111111111}$
 $-$
 1000110

$\sim (1225) \quad 5^{\text{th}} \rightarrow 0$
 $30 - 1 \Rightarrow 1111$

$\sim (1225)$

$00000000000000000000000000000000$
 ~ 11110

0111110

No char

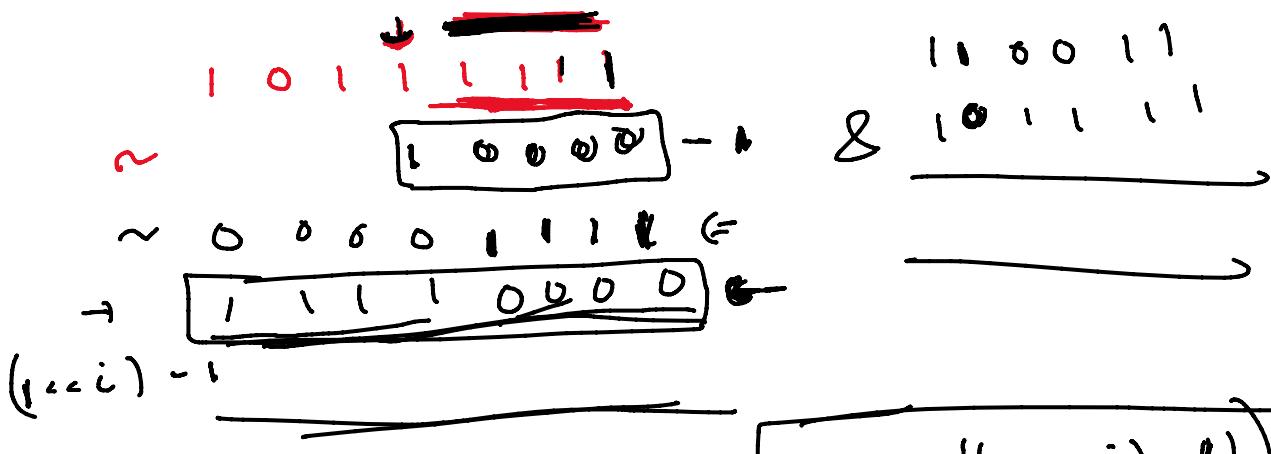
Uppercase to lowercase \rightarrow $c \& ' ';$

lowercase to uppercase \rightarrow $c \& ' - ';$

$$\begin{array}{r} 10000 \\ \underline{-1} \\ 1111 \end{array}$$

Ques

Clear all ~~one~~ bits till ith bit

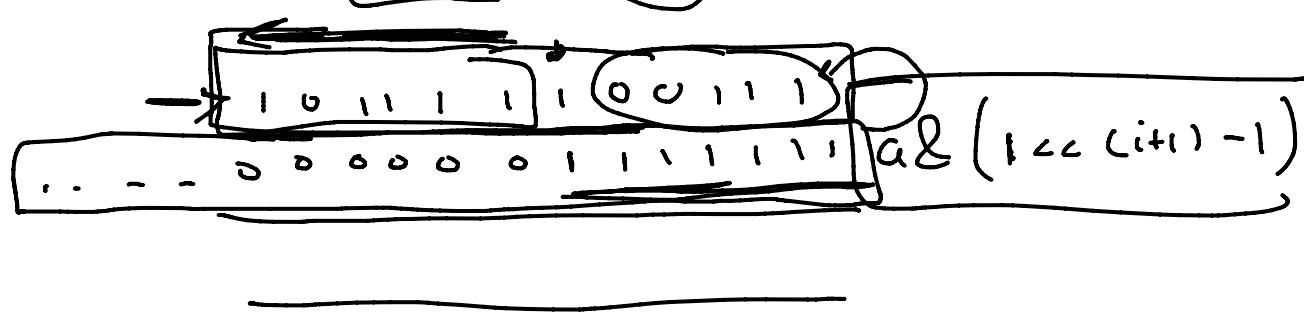


(clear all LSB till ith) \rightarrow

$$a \& (\underbrace{a(1 \ll i) - 1})$$

Ques-2 Clear all MSB till ith

mask \rightarrow



Bit Masking

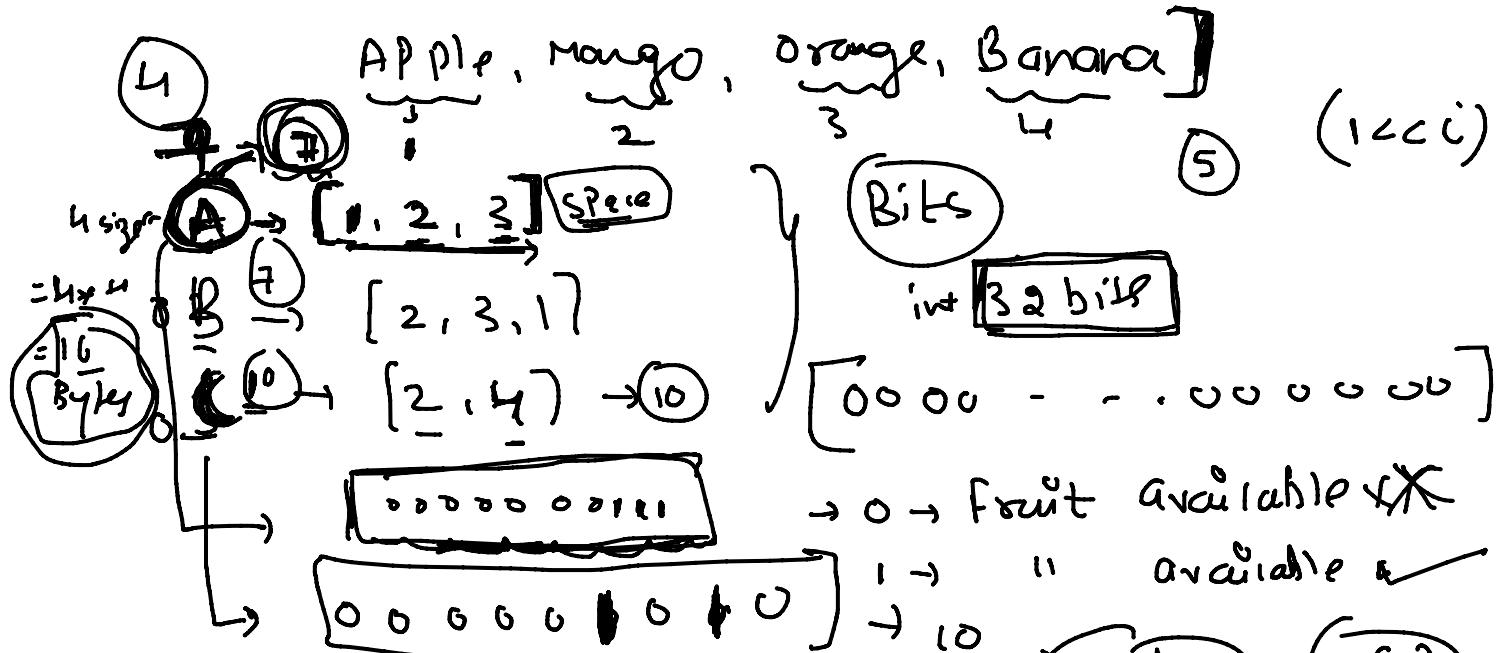
Bit Mask

\rightarrow Sequence of bit used to change bit

...

→ Debounce of bit used to change the value of something or prevent something.

[1, 2, 3, 4]



32 bits

5th fruit

30 bits

3(1)

a1(12<5)

DP + Bitmasking

[Generate all subsets using Bitmasking]

[1, 2, 3, 4, 5, 6] → Subsets

2⁶

{1} {2} {3} {4} {5} {6}

{1, 2} {1, 3} {1, 4} {1, 5} {1, 6}

$\{2^0, 2^1, 2^2, 2^3, 2^4, 2^5, 2^6\}$

$\{1, 2, 3, 4\}$
Mask

1st index
 $\begin{array}{r} 000010 \\ \oplus \\ 010010 \end{array} \rightarrow \{2^4\}$
 $001011 \rightarrow \{1, 2, 4\}$
 $001111 \rightarrow \{1, 2, 3, 4\}$

$111111 \rightarrow \{1, 2, 3, 4, 5, 6\}$

Total subsets $\Rightarrow 2^6$
Mask = ?

Mask = 0
Mask = 1
 $= 2$

$\begin{array}{r} 00000000 \\ \oplus \\ 00000001 \\ \oplus \\ 00000100 \end{array} \rightarrow \{ - \}$
 $00000111 \rightarrow \{1, 2\}$
 $00001000 \rightarrow \{3\}$