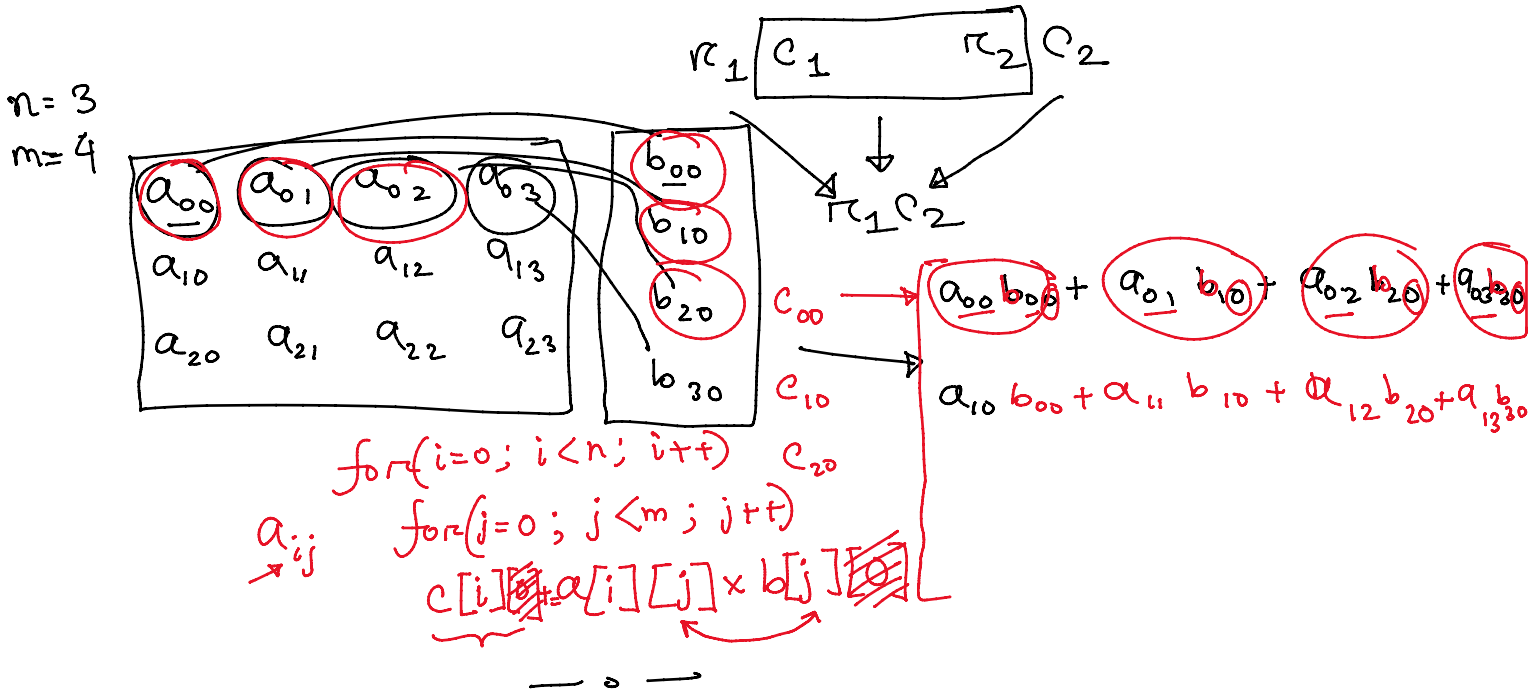
Class 11

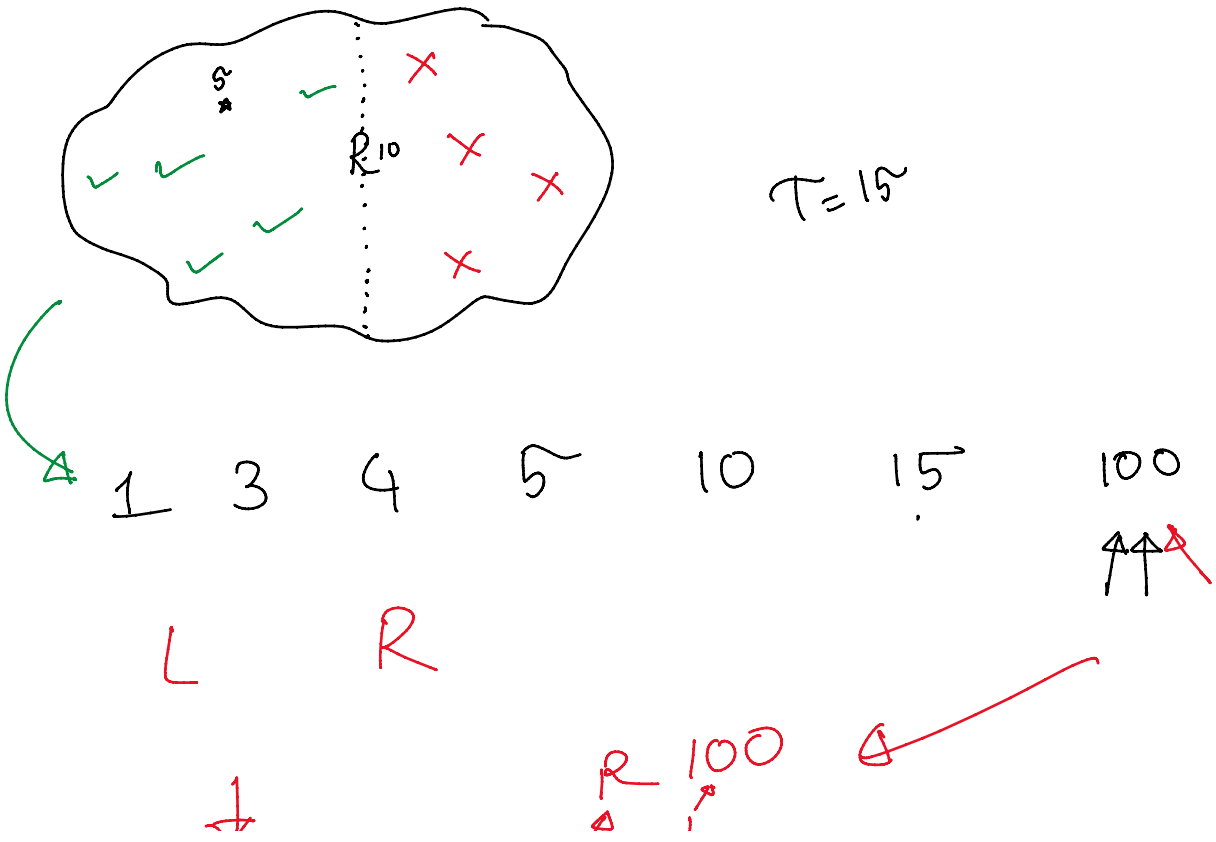
Tuesday, June 22, 2021 10:08 PM

$A = n \times m$

$B = m \times 1$ $\rightsquigarrow$ $AB = n \times 1$



Binary Search



```
L=0
R=n-1
while (L<=R)
{   M = (L+R)/2
    if(arr[M]==T) return true;
    elseif(arr[M] <T)
            L=M+1
    else R=M-1
}
return false;
```

$N \to N/2 \to N/4 \to N/8 \to \dots \to 1$

$\frac{N}{2^k} = 1$

$\therefore N = 2^k$

$\therefore k = \log_2(N)$

$L = 3$

$R = 5$

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sqrt()

$\sqrt{37}$

L	R	Guess
0	37	$(18.5)^2 > 37$
0	18	$(9)^2 > 37$
0	9	$(4.5)^2 < 37$
4.5	9	$(6.75)^2 > 37$
4.5	6.75	$(5.625)^2 < 37$
5.625	6.75	$(6.1875)^2 > 37$

4.5 0.75 $(5.0625)^2 > 37$

5.625 6.75 $(6.1875)^2 > 37$

5.625 6.1875 $(5.90625)^2 < 37$

5.90625 6.1875 $(6.046875)^2 < 37$

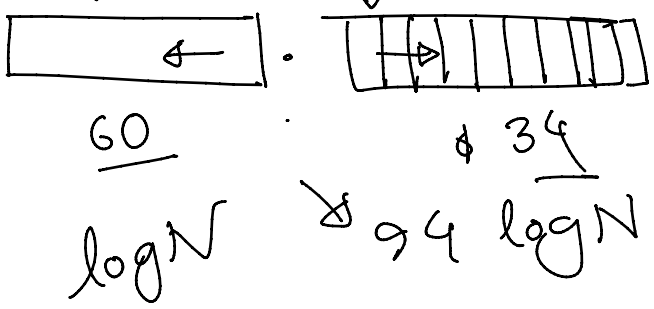
6.046875 6.1875 $6.1171875 > 37$

6.046875 6.1171875

$10^{18} \longrightarrow 60$

$10\ldots\ldots0 \longrightarrow 60$

L+R



$\log N + 94 \log N$

$10^{28} \longrightarrow \log_2(10^{28}) \to 94$

$2 \log N \longrightarrow \log N$

$\log_{10}(n)$