Example:

$S = 1, 3, 2, 1, 2, 3, 4, 3, 1, 2, 3, 1$

$h(x) = (6x + 1)\ mod\ 5$

Assume |b| = 5

x	h(x)	Rem	Binary	r(a)
1	7	2	00010	1
3	19	4	00100	2
2	13	3	00011	0
1	7	2	00010	1
2	13	3	00011	0
3	19	4	00100	2
4	25	0	00000	5
3	19	4	00100	2
1	7	2	00010	1
2	13	3	00011	0
3	19	4	00100	2
1	7	2	00010	1

R = max(r(a)) = 5

So no. of distinct elements = $N = 2^R = 2^5 = 32$

Date 03 03 20

Flojet Martin algo FM.

(10M) Q. Determine Distinct element using FM algo.
Hash function $H(x) = 6x+1$ f mod 5.

Step 1 :-

$h(x) = h(1) = (6x+1) \bmod 5 = (6\times1+1) \bmod 5 = 7 \bmod 5 = \frac{7}{5} = 2$

$h(2) = " " = (6\times2+1) \bmod 5 = 13 \bmod 5 = \frac{13}{5} = 3$

$h(3) = " " = \frac{19}{5} = 4$

$h(4) = " " = \frac{25}{5} = 0$

Step 2 :- Binary representation (3bits)

$h(1) = 2 = 010$ $\boxed{1}$

$h(2) = 3 = 011$ $\boxed{0}$

$h(3) = 4 = 100$ $\boxed{2}$

$h(4) = 0 = 000$ $\boxed{0}$

~~Step 3 : find out the maximum value~~

Step 3 : Count each 0 after one (1) from binary representation of step 2.

$h(1) = 1$

$h(2) = 0$

$h(3) = 2$

$h(4) = 0$

Step 4 : find out max^m value from step 3.

$\therefore h(3) = 2$

$x = 2$.

Step 5 : Distinct element

$R = 2^x = 2^2$

$R = 4$