

$$R = \{10, 5, 6, 8, 7, 1, 3, 5, 6, 4\}$$

$$\textcircled{1} \text{ basis } \langle b_1, b_2 \rangle = \langle 5, 4 \rangle$$

x	$C_1 = x \bmod 5$	$C_2 = x/5 \bmod 4$
10	$10 \bmod 5 = 0$	$(10/5) \bmod 4 = 2$
5	0	1
6	1	1
8	3	1
7	2	1
1	1	0
3	3	0
5	0	1

6

1

1

4

4

0

Bit map for C_1 [5 bits for 0, 1, 2, 3, 4]

$$\bullet C_1(0) = [1, 1, 0, 0, 0, 1, 0, 1, 0, 0]$$

$$\bullet C_1(1) = [0, 0, 1, 0, 0, 0, 1, 0, 1, 0]$$

$$\bullet C_1(2) = [0, 0, 0, 0, 1, 0, 0, 0, 0, 0]$$

$$\bullet C_1(3) = [0, 0, 0, 1, 0, 0, 0, 0, 0, 0]$$

$$\bullet C_1(4) = [0, 0, 0, 0, 0, 0, 0, 0, 0, 1]$$

Bit map for C_2 :-

$$C_2(0) = [0, 0, 0, 1, 0, 0, 0, 0, 0, 1]$$

$$C_2(1) = [0, 1, 1, 0, 1, 1, 1, 1, 1, 0]$$

$$C_2(2) = [1, 0, 0, 0, 0, 0, 0, 0, 0, 0]$$

$$C_3(3) = [0, 0, 0, 0, 0, 0, 0, 0, 0, 0]$$

do) $n :-$

\rightarrow must cover all the unique remainders of $C_1 \& C_2$.

$m :-$

Should be large enough to cover the second modulus of all numbers.

C_3

$$[1-3] : [0, 0, 0, 1, 0, 1, 1, 0, 1, 0]$$

$$[4-6] : [0, 0, 1, 0, 1, 0, 0, 1, 0, 1]$$

$$|7-9| : [0, 0, 0, 0, 1, 0, 0, 0, 0, 0]$$

$$|10| : [1, 0, 0, 0, 0, 0, 0, 0, 0, 0]$$

d. Two queries are needed in a range coded bitmap to evaluate the overlap.

Ex-

Query 4 accesses

[1-3] and [4-6]