CS 5600
Advanced Database Systems
Written Assignment - 2

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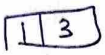
#00f41f67.

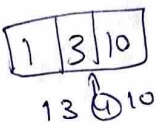
1) Create the B+ Tree Index(m=4) after insert the following input index:
1, 3, 10, 4, 5, 1, 2, 3, 5, 6, 7, 8, 9, 11, 10, 2, 3, 7, 8, 12, 1, 4, 5.

Sol:- Insert 1 =>

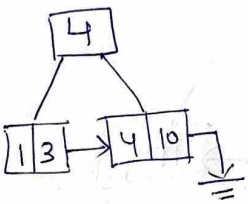
Insert 3 =>



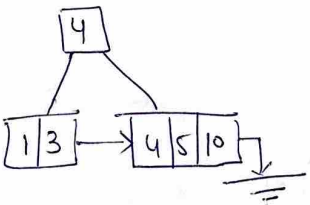
Insert 10 =>



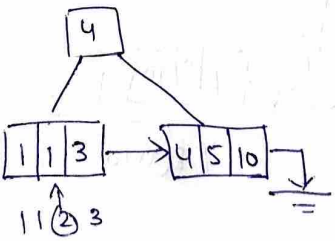
Insert 4 =>



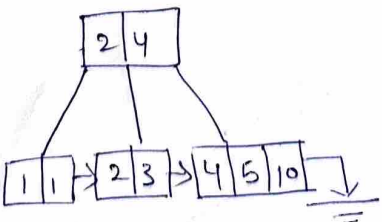
Insert 5 =>



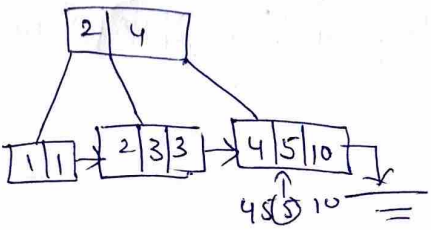
Insert 1 =>



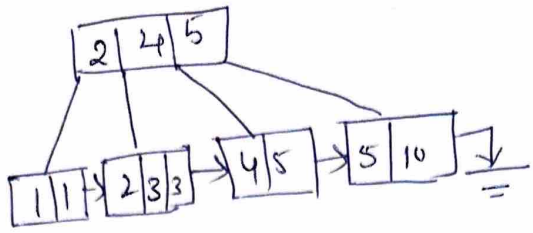
Insert 2 =>



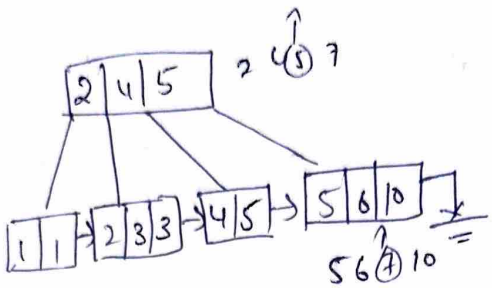
Insert 8 =>



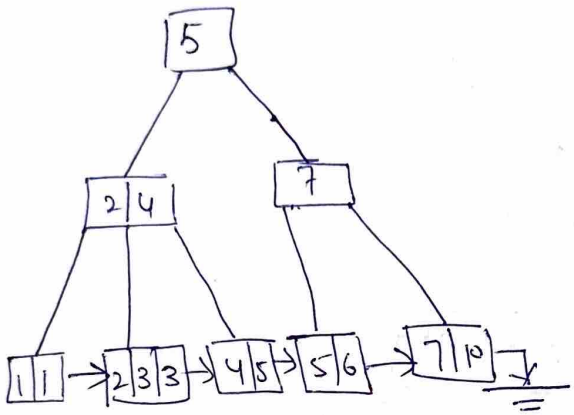
Insert 5:



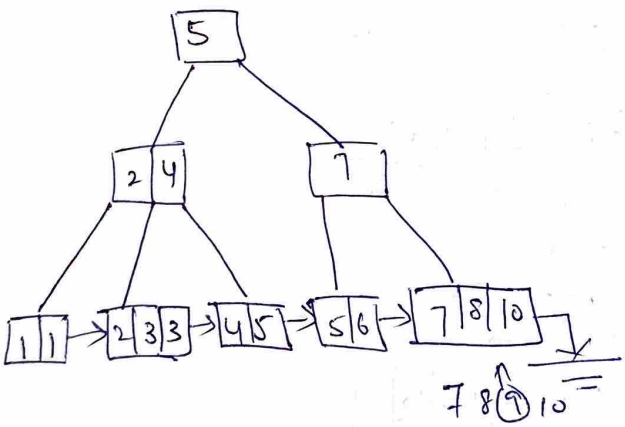
Insert 6:



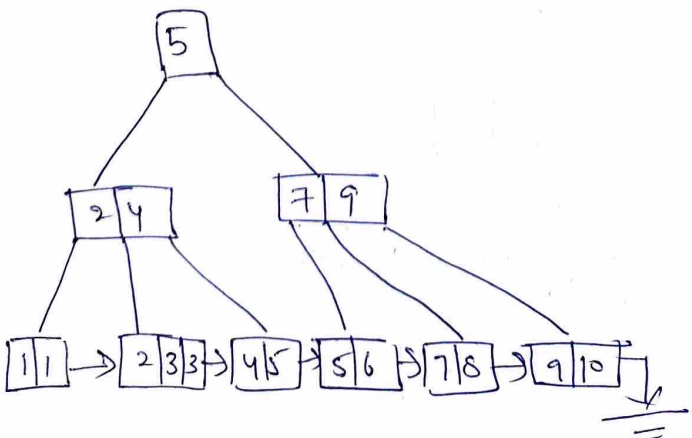
Insert 7:



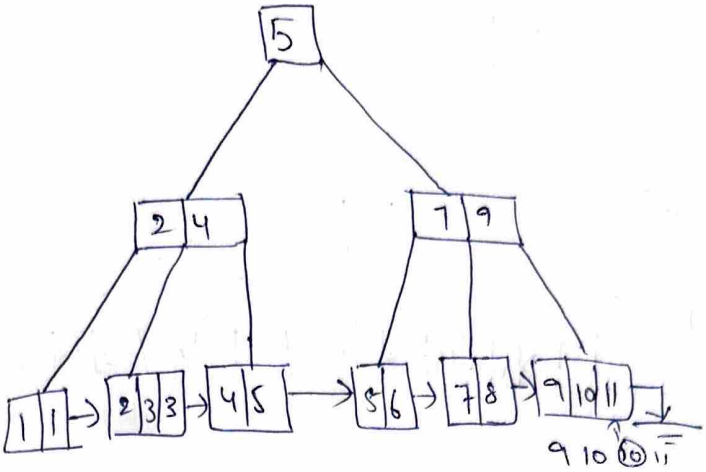
Insert 8:



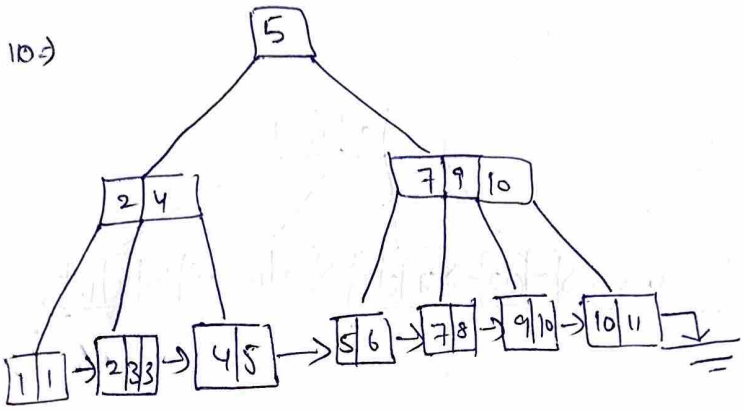
Insert 9:



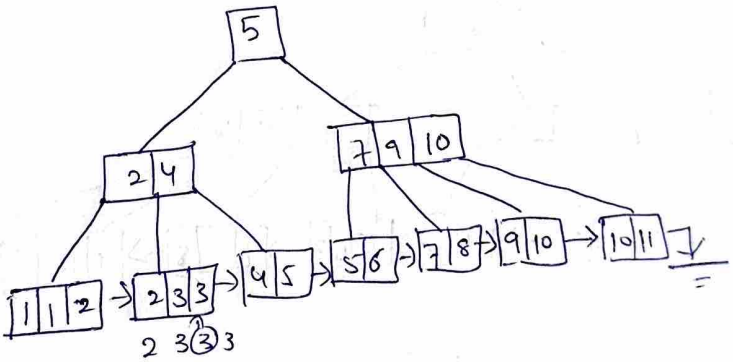
Insert 11 =>



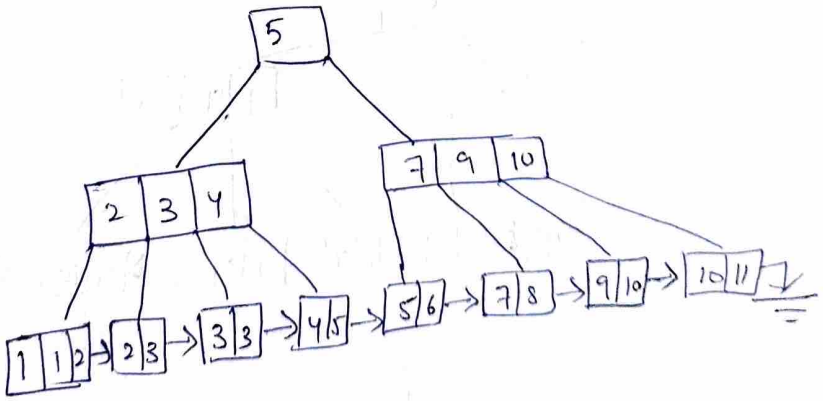
Insert 10 =>



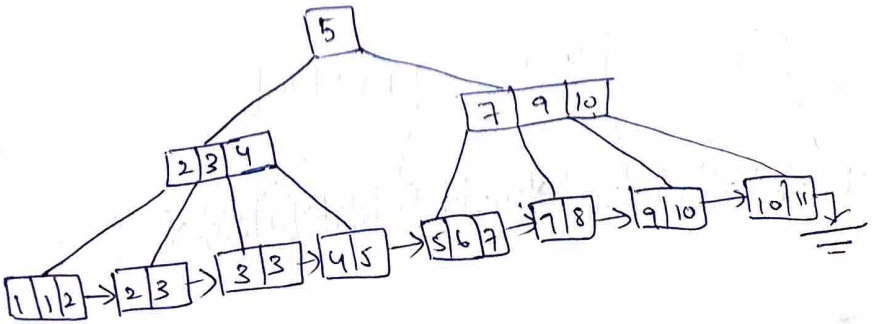
Insert 2 =>



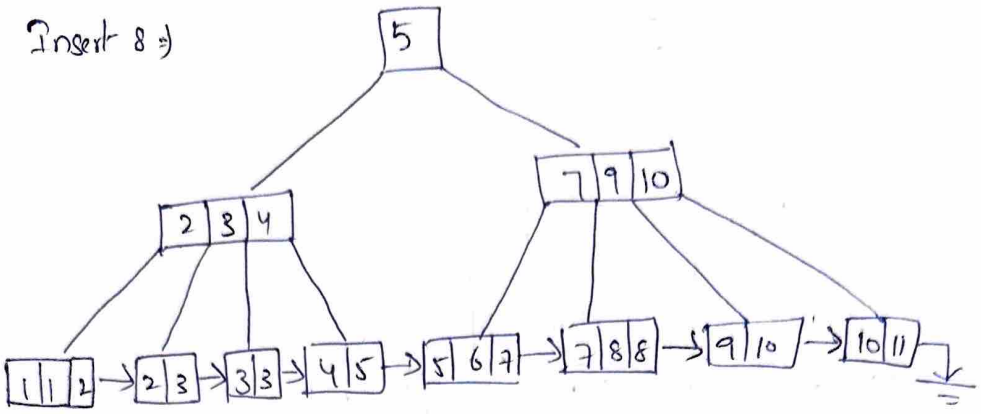
Insert 3 =>



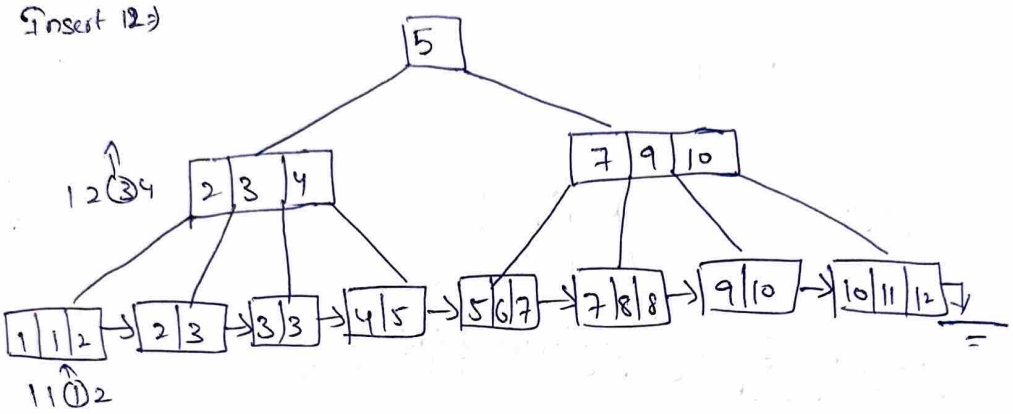
Insert 7 =>



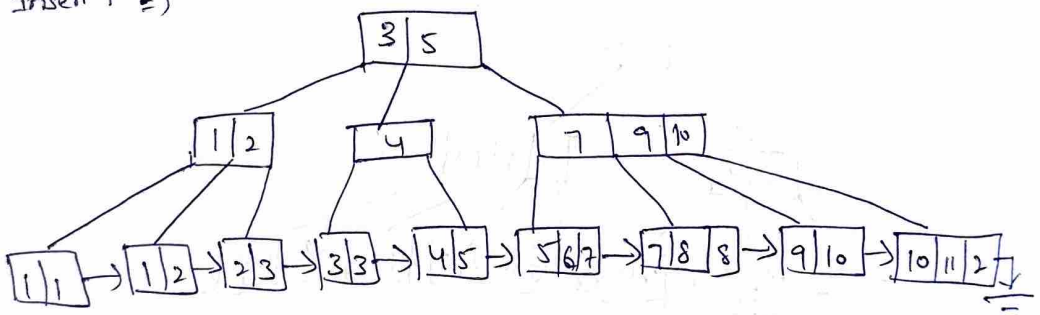
Insert 8 =)



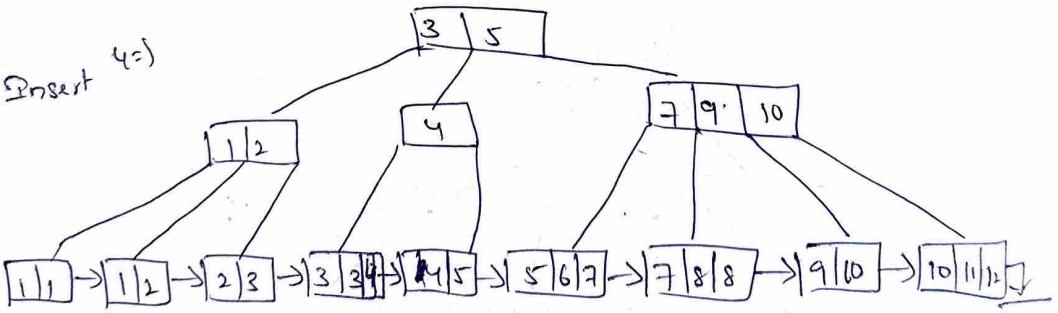
Insert 12 =)



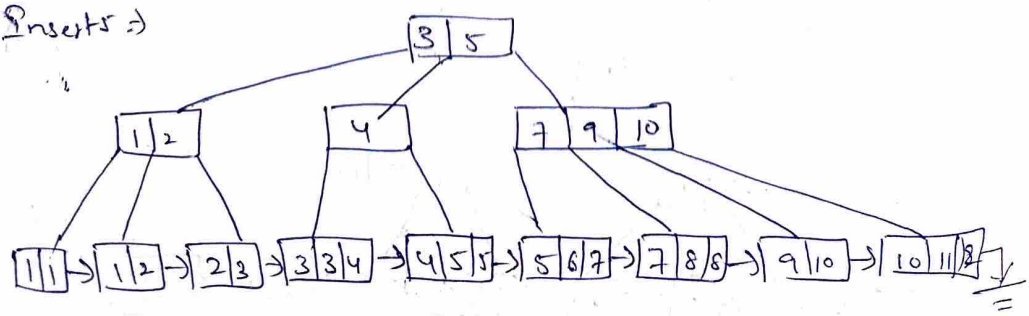
Insert 1 =)



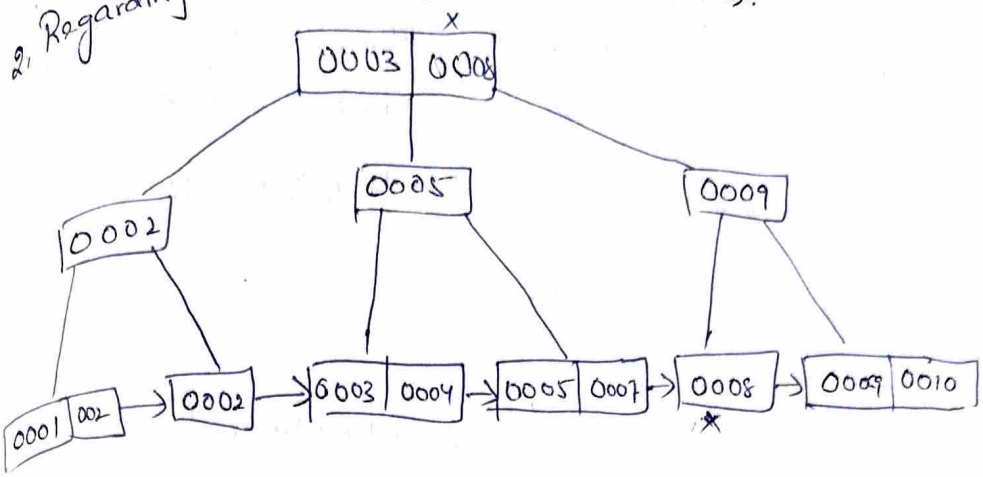
Insert 4 =)



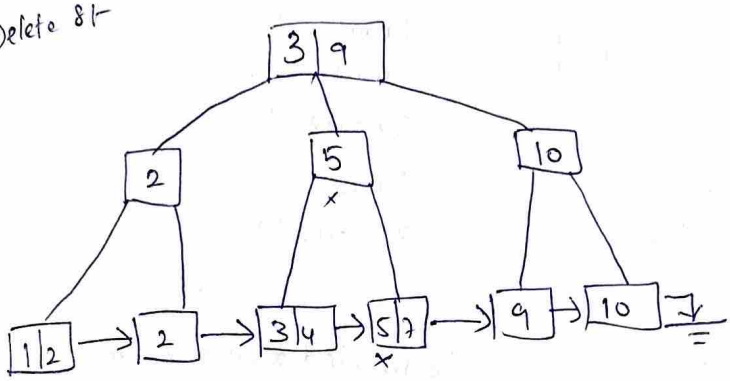
Insert 5 =)



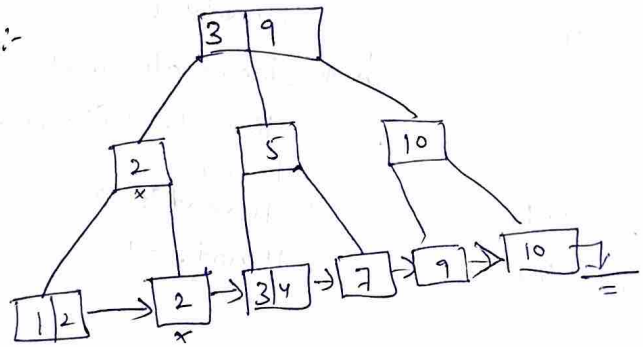
2. Regarding the following B+ tree index (m=3):



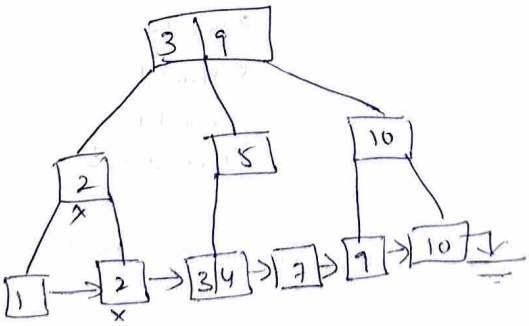
Delete 8:-



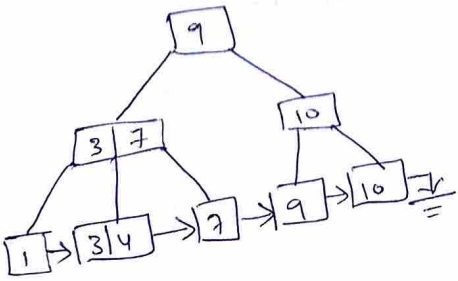
Delete 5:-



Delete 2:-



Delete 2:-



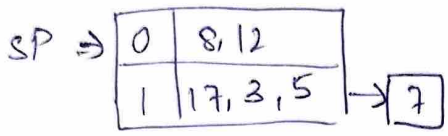
3, Linear Hash:-

Create a hash table from the following index values, with the bucket size 3, and initial hash function:- hash1 : index value mod 2.

Given input index keys:- 8, 17, 12, 3, 5, 7, 10, 11, 1, 9, 4, 6, 14.

3.1, What is hash table after round 0?

Round 0:-



hash1 :- index value mod 2

8 mod 2 = 0

17 mod 2 = 1

12 mod 2 = 0

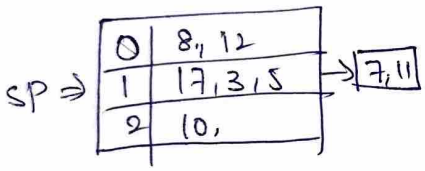
3 mod 2 = 1

5 mod 2 = 1

7 mod 2 ⇒ 1

Overflow on bucket #1

Rehash on bucket #0



hash2 :- index value mod 4

8 mod 4 = 0

12 mod 4 = 0

hash1 : index value mod 2

10 mod 2 = 0 (Rehashes SP at 1)

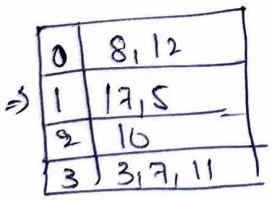
hash 2

10 mod 4 = 2

11 mod 2 = 1

Overflow on bucket #1

Rehash on bucket #1



17 mod 4 = 1

3 mod 4 = 3

5 mod 4 = 1

7 mod 4 = 3

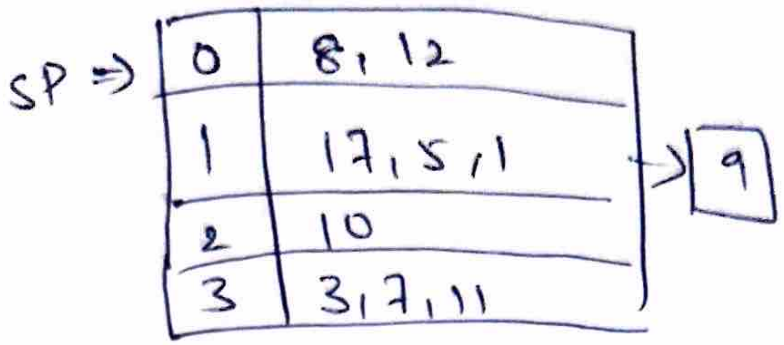
11 mod 4 = 3

Here split pointer cannot point to next pointer so ending Round 0

—— End of Round 0 ——

3.21 What is final hash table?

Round 1:



Overflow on bucket #1

Rehash on bucket #0

Use hash2: index value mod 4

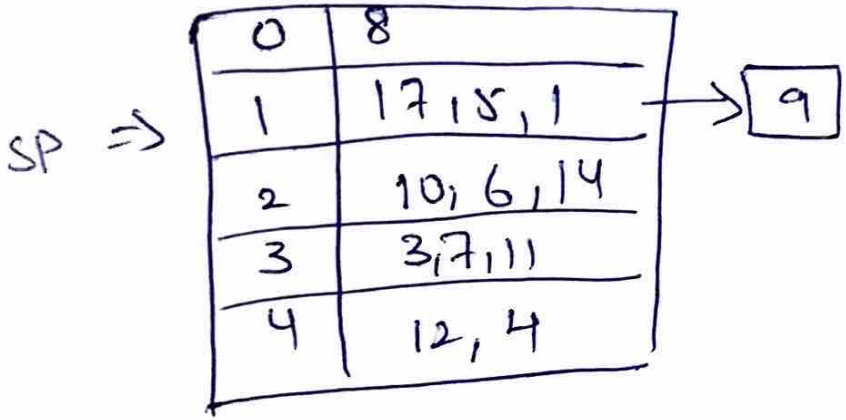
1 mod 4 = 1

9 mod 4 = 1

hash3: index value mod 8

8 mod 8 = 0

12 mod 8 = 4



4 mod 4 = 0 (SP at 1 so Rehash)

4 mod 8 = 4

6 mod 4 = 2

14 mod 4 = 2