

### Exercise 1 – Linear Hashing

P = which bucket to split

M = number of buckets

Split Policy = Greater than 75%

Bucket Capacity = 2

Add the following values:

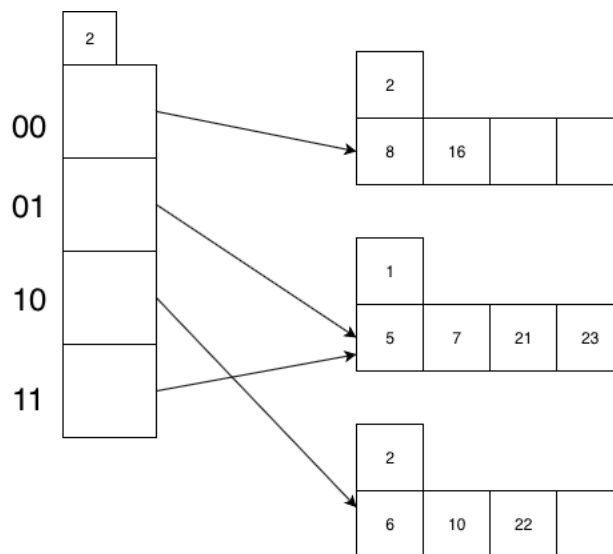
8, 13, 10, 15, 19, 22, 16

### Exercise 2 – Extensible Hashing

Consider the following 5 update operations:

| Operation # | Operation | Key Value   |
|-------------|-----------|-------------|
| 1           | Insert    | 20 (10100)  |
| 2           | Insert    | 46 (101110) |
| 3           | Delete    | 23 (10111)  |
| 4           | Insert    | 18 (10010)  |
| 5           | insert    | 9 (1001)    |

Now consider an extensible hash structure where each bucket can hold up to 4 entries and an initial state as shown below:



- Draw the extensible hash structure and its contents after the 5 operations have occurred in the order shown above.
- What is the maximum number of data entries that can be inserted into the index you have created in a) before you have to split a bucket? Explain briefly.
- What is the minimum number of record insertions into the index that you created in a) that will cause a split of all buckets? Explain briefly.