Linear Hashing example

- Suppose that we are using linear hashing, and start with an empty table with 2 buckets (M = 2), split = 0 and a load factor of 0.9. Explain the steps we go through when the following hashes are added (in order):

  5; 7; 12; 11; 9

Next Split at	Bucket no	Hash function	Elements	Comments
0	0	Mod 2		
	1	Mod 2		

5:

Next Split at	Bucket no	Hash function	Elements	Comments
0	0	Mod 2		
	1	Mod 2	5	Load factor 0.5<0.9

7:

Next Split at	Bucket no	Hash function	Elements	Comments
0	0	Mod 2		
	1	Mod 2	5, 7	Load factor 1>0.9; need split

After the split

Next Split at	Bucket no	Hash function	Elements	Comments
1	0	Mod 4		
	1	Mod 2	5, 7	Load factor .67<0.9;
	2	Mod 4		

12:

Next Split at	Bucket no	Hash function	Elements	Comments
1	0	Mod 4	12	
	1	Mod 2	5, 7	Load factor1>0.9; need split
	2	Mod 4		

Next Split at	Bucket no	Hash function	Elements	Comments
0	0	Mod 4	12	
	1	Mod 4	5	Load factor 0.75<0.9;
	2	Mod 4		
	3	Mod 4	7	

After split (Now M=4)

11

Next Split at	Bucket no	Hash function	Elements	Comments
0	0	Mod 4	12	
	1	Mod 4	5	Load factor 1>0.9; Need split
	2	Mod 4		
	3	Mod 4	7, 11	

Next Split at	Bucket no	Hash function	Elements	Comments
1	0	Mod 8		
	1	Mod 4	5	Load factor 0.75<0.9;
	2	Mod 4		
	3	Mod 4	7,11	
	4	Mod 8	12	

9

Next Split at	Bucket no	Hash function	Elements	Comments
1	0	Mod 8		
	1	Mod 4	5, 9	Load factor 1>0.9; Split
	2	Mod 4		
	3	Mod 4	7,11	
	4	Mod 8	12	

Next Split at	Bucket no	Hash function	Elements	Comments
2	0	Mod 8		
	1	Mod 8	9	
	2	Mod 4		
	3	Mod 4	7,11	
	4	Mod 8	12	
	5	Mod 8	5	