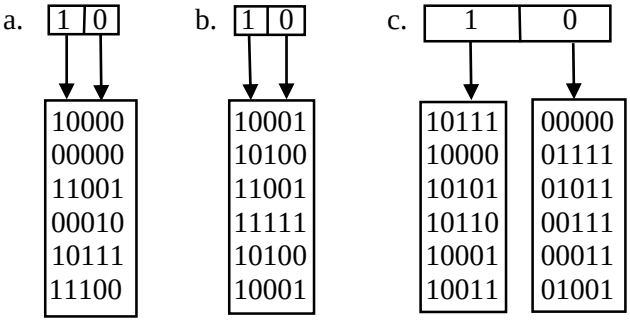
ECS 60 **Written Homework #4: Hash Tables (15 points)** **Winter 2016**

Due Monday, February 8th, 4:00 pm in 2131 Kemper

1. (6 points, 2 points each) Show the contents of the final open addressing hash table with an initial size of 5. Each table should rehash when its load factor is about to go over 0.5 because of an insert. Use h_1 = key % table_size as the hash function for all the parts. Please consider each hash table to be separate, and independent of the other two.
   a. Linear probing: Insert 14, insert 3, insert 25, delete 14, insert 5, insert 36, insert 15
   b. Quadratic probing: Insert 5, insert 13, delete 5, insert 2, insert 11, insert 6, insert 24, insert 17.
   c. Double hashing with h_2 = (key % 4) + 1: Insert 4, insert 59, insert 15, insert 37, insert 26

2. (2 points) Draw a separate chaining hash table of size 7 (with its linked lists) with h_1 = key % 7 for the following number being inserted. Numbers are inserted at the front of their respective lists. 11, 18, 13, 21, 9, 6, 7, 20, 4, 25.

3. (6 points, 2 points each) Insert 10010 into each of the following extendible hashes with M = 6.



4. (1 point) The isEmpty() routine for quadratic probing has not been written. Why cannot you implement it by returning the expression currentSize==0? Adapted from our text 5.6.