1. (a) Suppose you have a hash table starting at size $N = 3$ which uses chaining as its collision resolution technique, as well as the hash function

$$h(k) = Pk \mod N$$

where $P = 139$ and N is the current size of the table. Insert the following integers into the hash table. When the load factor $l \geq 0.75$, double the size of the hash table and rehash. Draw the hash table at each stage, i.e., you should have a drawing of each size hash table.

$$\{118, 189, 110, 160, 235, 127, 55, 141, 126, 181\}$$

(b) How many times did you rehash the table, and what was the current load factor and collision rate just before rehashing?

(c) What was the final load factor and collision rate?

(d) How many times would you expect to have to resize / rehash the table in general if the table size began at $N = 1$ and you had m keys to insert?