We can rehash to a larger table to make the search time of a hash table better.

In separate chaining, elements are put in linked lists if collision occurs. However, the performance of the hash table quickly degrades when the size of each linked list gets larger.

Now you have to calculate the maximum chain length of the linked lists in a hash table that has been implemented using separate chaining.

Start with a hash table having an input size N and an input load factor p.

Now do insertions. After every 100 insertions, check whether the maximum chain length has become larger than 10. If so, rehash to a larger table having size approximately 1.2 times of the current size, but the new size should also be prime. Report the average search time and maximum chain length just before and just after rehashing.

Now do deletions. After every 100 deletions, check whether the maximum chain length has fallen below 3. If so, rehash to a smaller table having size approximately 0.8 times of the current size, but the new size should also be prime. Report the average search time and maximum chain length just before and just after rehashing.

Remember, for calculating the average search time, search for 10% of the elements randomly.