1. Hash functions can be broken into two components: ________ hash code ________ that converts a key to an integer and an ________ compression function ________ that maps an integer to an index in \([0, N - 1]\).

2. Consider a hash table \(H\) of size \(N = 11\) (i.e., array is \(A[0..10]\)) and the hash function

\[ h(k) = (1 + k) \mod (N - 1) \]

(a) The key 19 maps to location ________ 0 ________
(b) The key 10 maps to location ________ 1 ________
(c) True or False: With \(h(k)\) each cell in the array \(A\) has an equally likely chance of being selected.

3. Assume there are \(N\) slots in your hash table, and that there are \(n\) data items stored in your hash table.

(a) In hashing with chaining, the space usage will be \(\Theta(\underline{n+N})\).
(b) In open-addressing hashing, the space usage will be \(\Theta(\underline{N})\).

4. The expected space used by a skip list with \(n\) elements is ________ \(O(n)\) ________, and the expected time to search for an element in a skip list is ________ \(O(\log n)\) ________, which is asymptotically ________ < ________ (one of <, =, or >) than the worst-case time for searching in a binary search tree.