1. Which is the correct invariant relating `equals()` and `hashCode()`?
   (A) Two objects that have the same `hashCode` must be equal.
   (B) Two objects that are `equal` must have the same `hashCode`.

2. Choose an appropriate ADT for each of the following applications.
   (a) A telephone book with names and phone numbers.
       set stack queue priority queue dictionary
   (b) An index for a book with terms and page numbers.
       set stack queue priority queue dictionary
   (c) A router that forwards packets in a computer network.
       set stack queue priority queue dictionary

3. Which of the following concrete data structures has the fastest worst-case lookup time for elements in an ordered set?
   linked list sorted array unsorted array hashtable

4. Fill in the blanks.
   (a) Time for lookup in a hashtable is $O(1)$ expected and $O(n)$ worst-case.
   (b) The load factor of a hashtable is $n/m$, where $n$ is the number of elements and $m$ is the size of the array.
   (c) Every comparison-based sorting algorithm takes at least $\Omega(n \log n)$ time in the worst case.