NetID: hxie13 QuizID: 756613 Score: 2 / 5 Answer Source: PrairieLearn

1. Which of the following statement(s) is TRUE?

(i) A hash function takes a message of arbitrary length and generates a fixed length code.

(ii) A hash function takes a message of fixed length and generates a code of variable length.

(iii) A hash function may give the same hash value for distinct messages.

A. None of the above options are correct.
B. ii and iii only
C. i only
D. [Correct Answer] i and iii only
E. [Your Answer] ii only

2. What is the best definition of a collision in a hash table?

A. Two entries are identical except for their keys.
B. None of the other options are correct.
C. [Correct Answer] [Your Answer] Two entries with different keys have the same exact hash value.
D. Two entries with the exact same key have different hash values.
E. Two entries with different data have the exact same key.

3. The CS department wants to maintain a database of up to 1800 UINs of students who have taken CS 225 so that it can be determined very quickly whether or not a given student has taken the course. Efficient use of memory and speed of response are equally important. Which of the following data structures would be most appropriate for this task?

A. A hash table using probing with capacity 1800
B. A sorted linked list
C. [Correct Answer] A hash table using probing with capacity 4500
D. [Your Answer] A sorted array with 1800 entries
E. A hash table using probing with capacity 1000

4. Given a hash table `T` with load factor 80 and it has 25 slots, the number of elements that can be stored in hash table is:

A. 4000
B. None of the other options are correct.
C. 6.4
D. 3.2
E. [Correct Answer] [Your Answer] 2000

5. Suppose a hash table has size 10, and that the search keys are strings consisting of 3 lower case letters. We want to hash 7 unknown values from this keyspace. In the hash function, when we refer to the alphabet positions of the letters, we mean: `a = 1, b = 2, ..., z = 26` and `h(k) = ({product of the alphabet positions of k's letters}) mod 10`

Which of these ideal hash function characteristics are violated by this hash function?

(i) A good hash function is deterministic.

(ii) A good hash function distributes the keys uniformly over the array.

(iii) A good hash function is computed in constant time.

A. Only (i) is violated.
B. None of these characteristics are violated.
C. Only (iii) is violated.
D. [Your Answer] At least two of (i), (ii) and (iii) are violated.
E. [Correct Answer] (ii) is violated.