Started on	Sunday, 7 May 2023, 11:14 PM
State	Finished
Completed on	Sunday, 7 May 2023, 11:21 PM
Time taken	6 mins 59 secs
Grade	**8.00** out of 10.00 (**80**%)

Question 1

Correct

Mark 1.00 out of 1.00

When the load factor of a Hash Table exceeds a certain threshold, what operation is commonly performed?

a. Expansion

b. Allocation

c. Rehashing ✔

d. Cloning

The correct answer is:
Rehashing

Question 2

Correct

Mark 1.00 out of 1.00

Consider a hash table with 50 slots which use chaining as a collision avoidance mechanism. And assume **simple uniform hashing**. What is the probability that the first 3 slots are unfilled after the first 3 insertions?

Hint - Check Uniform Hashing

a. $\frac{47\times47\times47}{50\times50\times50}$ ✔

b. $\frac{49\times48\times47}{50\times50\times50}$

c. $\frac{47\times47\times47}{3!\times50}$

d. $\frac{49\times49\times49}{50\times50\times50}$

The correct answer is: $\frac{47\times47\times47}{50\times50\times50}$

Question 3

Correct

Mark 1.00 out of 1.00

Possible hash function to store string in hash table is the string's length, h(x) = x.length. This a good hash function.

Select one:

- True
- False ✔

Strings with the same length will have the same hash code.If we insert lots of strings with the same length, lookup will take O(n) time instead of O(1)

The correct answer is 'False'.

Question 4

Correct

Mark 1.00 out of 1.00

Disadvantages of Direct Address table

- a. Simple implementation
- b. Efficient operations
- c. One to one mapping
- d. Have to consider huge universe of keys ✔

The correct answer is: Have to consider huge universe of keys

Question 5

Correct

Mark 1.00 out of 1.00

The hash function for a hash table is
H1(k) = k % 50.
In the case of collision, the hash function used is
H(k) = (H1(k) + M x H2(k)) % 50
where H1(k) = k % 50 and H2(k) = k % 20.
M is initialized to 0 and is incremented by 1 each time a collision occurs.
This could be categorized under which of the following collision detection technique?

- a. Quadratic Probing
- b. Linear Probing
- c. Re-Hashing
- d. Double Hashing ✔

The correct answer is: Double Hashing

Question 6

Correct

Mark 1.00 out of 1.00

Given the following input (4322, 1334, 1471, 9679, 1989, 6171, 6173, 4199) and the hash function x mod 10, which of the following statements are true?

i. 9679, 1989, 4199 hash to the same value

ii. 1471, 6171 has to the same value

iii. All elements hash to the same value

iv. Each element hashes to a different value

a. ii only

b. i and ii only ✔

c. i only

d. iii or iv

The correct answer is: i and ii only

Question 7

Incorrect

Mark 0.00 out of 1.00

Given the values {2341, 4234, 2839, 430, 22, 397, 3920}, a hash table of size 7, and hash function h(x) = x mod 7, select the resulting tables after inserting the values in the given order with linear probing.

a. 0 [397] 1 [22] 2 [3920] 3 [2341] 4 [2839] 5 [430] 6 [4234]

b. 0 [430] 1 [22] 2 [3920] 3 [2341] 4 [2839] 5 [397] 6 [4234]

c. 0 [3920], 1 [22], 2 [ ], 3 [2341, 430], 4 [2839], 5 [397], 6 [4234] ✖

d. 0 [3920] 1 [430] 2 [22] 3 [2341] 4 [2839] 5 [397] 6 [4234]

The correct answer is: 0 [397] 1 [22] 2 [3920] 3 [2341] 4 [2839] 5 [430] 6 [4234]

Question 8

Correct

Mark 1.00 out of 1.00

The time complexity of all operations associated with Direct Address table are not O(1)

Select one:

True

False ✔

The correct answer is 'False'.

Question 9

Incorrect

Mark 0.00 out of 1.00

Suppose we have an empty **Hash Table**, where $H(k) = k \% M$ and $M = 7$. After inserting the keys 31, 77, and 708 into our **Hash Table** (in that order), which index will the key 49 end up hashing to using the collision resolution strategy of **Linear Probing**?

Answer: 1 ✖

The correct answer is: 2

Question 10

Correct

Mark 1.00 out of 1.00

In the context of Hash Tables, what does the term **'open addressing'** refer to?

a. Storing all elements in a single linked list

b. Storing collided elements in separate data structures

c. Storing collided elements in the same array as the Hash Table itself ✔

d. Storing collided elements in an auxiliary data structure

The correct answer is:
Storing collided elements in the same array as the Hash Table itself