Tutorial and Assignment Sheet – ODD 2021

15B11CI311 – Data Structures

Instructions

1. Tutorial Sheet of Week Number 'X' will be posted on the Google Classroom on Friday of week number 'X-1'.
2. It will be based on topics covered in Lecture in week 'X'.
3. Students are advised to come prepared in tutorial by revising the lectures of week 'X' and also by trying to attempt the tutorial sheet questions by themselves.
4. As tutorials will be problem solving based, always join the tutorial with a notebook and pen with you.

Week 5 (27st September to 2nd October 2021)

Topics : Hashing

Q1. Given the following keys (4322, 1334, 1471, 9679, 1989, 6171, 6173, 4199) and the hash function x mod 10, identify the keys having collisions.

Q2. The keys 12, 18, 13, 2, 3, 23, 5 and 15 are inserted into an initially empty hash table of length 10 using open addressing with hash function $h(k) = k \bmod 10$ and linear probing. What is the resultant hash table?

Q3. A hash table of length 10 uses open addressing with hash function $h(k)=k \bmod 10$, and linear probing. After inserting 6 values into an empty hash table, the table is as shown below.

0	
1	
2	42
3	23
4	34
5	52
6	46
7	33
8	
9	

Which one of the following choices gives a possible order in which the key values could have been inserted in the table?
(A) 46, 42, 34, 52, 23, 33
(B) 34, 42, 23, 52, 33, 46
(C) 46, 34, 42, 23, 52, 33
(D) 42, 46, 33, 23, 34, 52

Q4. How many different insertion sequences of the key values using the same hash function and linear probing will result in the hash table given in Question 3 above?

Q5. Consider a hash table with 100 slots. Collisions are resolved using chaining. Assuming simple uniform hashing, what is the probability that the first 3 slots are unfilled after the first 3 insertions?