

Indian Institute of Technology, Guwahati
Department of Computer Science and Engineering
Data Structure Lab (CS210)

Assignment: 10

Date: 3rd November, 2016.

Total Marks: 20 (Lab Assignment) + 30 (Offline assignment)

Deadline of Offline Assignment Submission: 9th November, 2016.

Lab Assignment:

1. Write a program that computes the number of collisions required in a random sequence of insertions using (i) Linear Probing, (ii) Quadratic Probing and (iii) Double Hashing. Consider the hash table of length m for all cases with the primary hash function $h'(k) = k \bmod m$. The table size m is user input. For quadratic probing, $c_1 = 1$ and $c_2 = 3$, and for double hashing, $h_2(k) = 1 + (k \bmod (m - 1))$. You need to create three hash tables, one for each (i) Linear Probing, (ii) Quadratic Probing and (iii) Double Hashing. Your Insert function should handle deletion of key from hash tables. Implement Delete function as well.
 - a. For your first experiment, set $m = 11$. Consider inserting the keys 10, 22, 31, 4, 15, 28, 17, 88, 59. For each insertion, print the index/location where it is placed in hash table and the number of collisions for each three cases (i.e., (i) Linear Probing, (ii) Quadratic Probing and (iii) Double Hashing.)
 - b. In next set of experiments, you take random number of random inputs and print the index/location where each input is placed in hash table and the number of collisions for each three cases (i.e., (i) Linear Probing, (ii) Quadratic Probing and (iii) Double Hashing.). If the number of entries is more than the table size, your insertion function should errors out with overflow message.

Offline Assignment: To be Updated.