Indian Institute of Technology Mandi
February-June 2015 Semester

CS202: Advanced Data Structure and Algorithms

Programming Assignment 4

Last date of submission: 9th April, 2016 – 10:00 PM

Implement the Dictionary data structure using hash table and suitable hash function using C++ programming language. This data structure should be implemented using the data from one of the following class of application.

1. Your program must include (i) **chaining**, (ii) **linear probing** and (iii) **double hashing** as collision resolution techniques. Each one is invoked by giving a proper choice in the program.
2. Dictionary ADT, Chaining, linear probing and double hashing ADTs are given in the moodle.
   Dictionary.hpp: abstract Dictionary interface.
   ChainedMap.hpp: Chained Hash Map
   OpenMap.hpp: Linear Probing Hash Map
   DoubleHashMap.hpp: Double hashing Hash Map
3. The dictionary class must at least have following interfaces (functions): search, insert and delete, other than constructors and destructors.
4. You should have a provision of displaying the contents of hash table. When the dictionary is displayed, it should **display both hash table index** and **key(s) in that**.
5. Hashing is implemented using your array and linked linear list ADT. Use the 'vector.hpp' and 'list.hpp' used in the previous assignments.
6. All the techniques are implemented with a provision for **rehashing** while hash table is full during (ii) and (iii). In (i), rehashing can be done when the length of the list at a slot of table is more than half the size of hash table.
7. Keys should be unique and Hashng should take care of non-numeric key. Check should be there to avoid inserting duplicate key.