Assignment 3

Consider a set of Indian students with “aadhar numbers” from 1 to 10 million. You want to create a hash table of 1000 students interested in cricket, with “aadhar number” as key. These 1000 students will be chosen uniformly at random (u.a.r.) (without replacement) from the space of 1 to 10 million aadhar numbers.

Insert, find and delete operations into the hash table should be supported. Implement it in the following ways:

1. Separate Chaining: You are free to choose the hash function and size of the hash table. The “chain” should be implemented as an AVL tree. You can re-use the code for the AVL tree that you have implemented in the previous assignment.
   (5 marks each for insert, search and delete).

2. Open Addressing with double hashing: You are free to choose the hash functions, but you have to implement them yourself. Choose two sizes of tables: one slightly larger than 1000 and one larger than 2000. Report the number of probes done for 100 successful searches (chosen u.a.r. from the 1000 students already present) and 100 unsuccessful searches (chosen u.a.r from the remaining).
   (10 marks each for insert, search and delete).