# Assignment 11 - Module 11 - Hashing

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**Topics**

Hash Table

Hashing Algorithm

Hash Index

**Description**

Write a program that provides for searching students by their id’s using hash table. The program will first input students one by one from a file (insert.txt) and insert them into hash table. Then it will input students one by one from a text file (search.txt) and perform searches for them in the hash table. It will keep a record of searches when required and display the summary results.

**Implementation**

**Class StudentHT**

Create a class StudentHT that provides for the following struct definitions, instance variables and methods.

struct RecType contains student id, first name, and last name.

struct NodeType contains student id, first name, last name, and a pointer to NodeType

hashPtr – an instance variable pointing to hash table array of pointers

a constructor to input hash table size

void insert (RecType item)

will insert an item in the hash table.

item search (RecType item)

Will search an item in hash table and will return it. If not found will return an item containing -1 for id.

void startStatistics ();

void endStatistics ();

void displayStatistics();

**Main Method**

Provide main method that will create the hash table object and call its methods.

**Hashing Algorithm**

Calculate the hash index from student id as below:

            hash index = (student id) % (total entries in hash table)

**Statistics**

Provide the following statistics

Total number if id’s searched

Total number of nodes searched

Average number of nodes search per id searched

**Testing**

Use the data in file Add.txt for inserting in the table

Use the data in file Search.txt for doing searches in the hash table.