SOURCE CODE: [LabLFTC/Lab2/Lab2 at main · davidalexandru1370/LabLFTC (github.com)]

Documentation

- For the symbol table I've used a generic hash table with separate chaining as collision handler. The size parameter from the constructor means the size of the of hashtable (number of cells). The symbol table stores the identifiers, strings and hashtables.
- The hash functions depend on the data type, for integers the hash function simply hash that number, for strings it sums up the ascii codes and hashes the sum. The hash number increases the efficiency of the hash function(mathematically, not asymptotically) if the number is prime.
- The hashtable uses an arrayList of arrayLists and it inserts the object at the index computed by hash function

Methods:

- Hashtable:

getSize() - returns the size of the hashtable

hash(key: Int) - hash the key by computing key % size

hash(key: String) - hash the sum of ascii codes of key computing sum % ascii

hash(key: Char) - hash the key by computing key % size

computeHashValue(key: T) - compute the hash of the key treating each known data type

insert(key: T) - insert a new value into the hashtable

contains(key: T) - returns true if the hash table contains the key, otherwise false

getPosition(key: T) - returns the position of the hashed key in the arrayList representation

- Symbol table

addIntConstant(value: Int) - returns the a pair of integers first one representing the hash value and the second one the index in the array list
addIdentifier(value: String) - returns the a pair of integers first one representing the hash value and the second one the index in the array list
addStringConstant(value: String) - returns the a pair of integers first one representing the hash value and the second one the index in the array list

hasStringIdentifier(string: String) - returns true if the string exists in the string hashtable, otherwise false
hasIntIdentifier(int: Int) - returns true if the integer exists in the integers hashtable, otherwise false
hasIdentifier(identifier: String) - returns true if the integer exists in the identifiers hashtable, otherwise false
getIdentifierPosition(identifier: String) - returns a pair of integers, where the first integer is the hash and the second one the index in the array list
getIntIdentifierPosition(int: Int) - returns a pair of integers, where the first integer is the hash and the second one the index in the array list
getStringIdentifierPosition(string: String) - returns a pair of integers, where the first integer is the hash and the second one the index in the array list
getIntByPosition(position: Pair<Int, Int>) - returns the int by given position
getStringByPosition(position: Pair<Int, Int>) - returns the string by given position
getIdentifierByPosition(position: Pair<Int, Int>) - returns the identifier by given position