

Documentation

The Symbol Table (ST) is formed of three distinct hash tables:

- one for identifiers
- one for integer constants
- one for string constants

Each hash table is represented by a list, and each position in the list contains another list to store values that hash to the same position.

Elements in the ST are identified by pairs of indices. The first index corresponds to the list where the element is stored, and the second index is its position within that list.

The hash function for integer values involves computing the value modulo the size of the list.

For string constants and identifiers, the hash function calculates the sum of ASCII codes of their characters modulo the size of the list.

The implementation of the hash table is generic and can handle various types of keys.

Operations for the Hash Table:

- ***hash(key: int): int***: Computes the position in the ST for adding an integer constant
- ***hash(key: string): int***: Computes the position in the ST for adding a string constant or an identifier, based on the sum of ASCII codes of their characters
- ***getHashValue(key: T): int***: Returns the corresponding position in the ST based on the type of 'key'
- ***add(key: T): (int, int)***: Adds the key to the hash table and returns its position if the operation is successful; otherwise, throws an exception
- ***contains(key: T): boolean***: Indicates whether the given key is in the hash table or not
- ***getPosition(key: T): (int, int)***: Returns the pos in the ST of the given key, if it exists; otherwise, (-1, -1)
- ***toString() (overridden method)***: Returns the string representation of the hash table

Operations for the ST:

- ***addIdentifier(name: string): (int, int)***: Adds an identifier to the ST and returns its position in the ST
- ***addIntConst(constant: int): (int, int)***: Adds an int const to the ST and returns its position in the ST
- ***addStringConst(constant: string): (int, int)***: Adds a string const to the ST and returns its pos in the ST
- ***getIdentifierPos(name: string): (int, int)***: Retrieves the position of the identifier in the ST
- ***getIntConstPos(constant: int): (int, int)***: Retrieves the position of the integer constant in the ST
- ***getStringConstPos(constant: string): (int, int)***: Retrieves the position of the string constant in the ST
- ***toString() (overridden method)***: Retrieves the string representation of the entire ST