

GitHub link: <https://github.com/hognogicristina/FLCT/tree/main/Lab2>

For my SymbolTable I chose to implement one HashTable which can be used for both the identifiers table and constants table, as well as one single table which contains both of them.

## HashTable

The HashTable class represents a basic hash table data structure. It is initialized with a specified capacity, which determines the number of buckets in the hash table. Buckets are used to store key-value pairs. This function creates an empty hash table with the specified capacity.

`get_capacity(self)` - This method allows you to retrieve the capacity of the hash table. It returns the number of buckets in the hash table.

`hash(self, key)` - The hash method is responsible for calculating the hash value of a given key. If the key is an integer, it calculates the hash using the modulo operation. If the key is a string, it employs a hashing algorithm that iterates through the characters of the string to compute a hash value.

`contains(self, key)` - The contains method checks if a given key exists in the hash table. It calculates the hash value for the key and then searches for the key within the corresponding bucket. It returns True if the key is found, and False if it is not found.

`get_hash_value(self, key)` - This function retrieves the hash value for a given key. It distinguishes between integer and string keys and calculates the hash value accordingly.

`add(self, key)` - The add method adds a key to the hash table. It calculates the hash value for the key and appends it to the corresponding bucket if the key is not already present in the table.

`get_position(self, key)` - This method returns the position (bucket index) where a given key would be stored in the hash table.

`__str__(self)` - Return a string representation of the hash table

## SymbolTable Class

The SymbolTable class is used to manage and store information about identifiers and constants in a programming language. It consists of two separate hash tables: one for identifiers and another for constants.

`add_identifier(self, name)` - Adds an identifier to the identifiers hash table and returns a

`add_constant(self, name)` - Adds a constant to the constants hash table and returns a reference to the added constant.

`has_identifier(self, name)` - Checks if a given identifier exists in the identifiers hash table and returns True if found, or False if not found.

`has_constant(self, name)` - Checks if a given constant exists in the constants hash table and returns True if found, or False if not found.

`get_position_identifier(self, name)` - Retrieves the position of a specific identifier in the identifiers hash table and returns the position or None if the identifier is not found.

`get_position_constant(self, name)` - Retrieves the position of a specific constant in the constants hash table and returns the position or None if the constant is not found.

`__str__(self)` - Returns a string representation of the SymbolTable, including details about both the identifiers and constants hash tables.