

<https://github.com/915-Podariu-Alexandru/FLCD/>

Laboratory 2

The Hash table is based on a List of lists(or buckets) which contain the data in an efficient manner.

The functions:

The Couple class allows for easy access to the position of a term in the Hash Table

- findPosition(String term) : returns the position for a term
- createHash(String Key) : returns the hash key, it is computed as the sum of the characters modulo the size
- add(String term) : add an element to the Hash Table
- containsTerm(String Term) : checks if the term has already been added to the HashTable, returns true or false
- getSize() : get the size of the Hash Table

These methods are then used by the Symbol Table by calling them.

Laboratory 3

The ProgramInternalForm is based on a List of Couples(each couple contains an element and its position in the SymbolTable).

Example:

```
SEPARATOR: '$' AT POSITION: {-1,-1}
RESERVED WORD: 'integer' AT POSITION: {-1,-1}
IDENTIFIER: 'a' AT POSITION: {97,0}
```

Regexes used:

- For Identifying the Constants:

- Matching numbers(with all variances, +/-, 0 case): `"^0|[-|+]?[1-9][0-9]*"`

- Matching characters(digit or letter enclosed by ''): `"^[a-zA-Z0-9]"`

- Matching strings(a sequence of digits and letters enclosed by ""): `"^[0-9a-zA-Z]*"`

- For Identifying the Identifiers: `"^[a-zA-Z][a-zA-Z0-9]*"`

- Matching the a sequence that starts with a letter followed by letters or digits

Laboratory 4

The MyScanner Class uses two Symbol Tables, one for Identifiers and the other one for Constants and a ProgramInternalForm

-ReadFromFile(): reads a program from its file

- ListofElements() creates a list of the elements contained in the program file, divided by the separators , calls upon Tokenize to create the tokens

- Tokenize() creates tokens out of the elements and specifically deals with the char and string constants, and the other elements

- Scan() parses the list of tokens and identifies each one of them as a Reserved Word, Separator, Operator, Constant or Identifier and it analyses whether the program has any lexical errors and outputs accordingly. It also adds the identified tokens to the PIF, and if necessary to the correct symbolTable(for Identifiers or for Constants)

- Getters for the SymbolTables and PIF

The Main file calls the file Reader, and The Scanner and then writes the PIF and SymbolTables for each program