Link to source code:
https://github.com/Akitektuo/University/tree/master/3rd%20year/FLCT/lab/Lab4

Scanner documentation

Containers used by scanner

Symbol table

The symbol table stores identifiers and constants in a hash table and their positions are passed to the *Program Internal Form (PIF)*

Program internal form

The PIF is a list made of pairs between tokens, identifiers and constants to positions. The positions of identifiers and positions are taken from the symbol table, and tokens will have no position (*saved as null*) as they are a predefined group of characters.
The class has two methods, one for adding tokens with positions to the list and one for writing the PIF to a file, having the option to specify the path and name of the file.

Token list

As in the name, it is a list of tokens which has functions to read from a file, add a token as string and automatically convert it into a token and an iterator with a callback. The type of the list, Token, is a generic class that holds a value and it is extended to different types of tokens: constants, identifiers, operators, reserved words, separators. The token class has a static method that categorizes a string to a type of token based on regex. If no regex matches the string, an unknown token exception will be thrown with the given value.

Methods of scanner

Validate tokens

This method calls the static method of token list to read from a file all the tokens which goes line by line and tries to convert it into a token. If a token is not valid, the unknown token exception will be thrown.

Scan

The method reads the given file line by line, extracting the tokens from each line, categorizing them and then based on their type, adding them to the symbol table, if it is an identifier or a

constant, or directly into the pif. If the parsed line does not have a valid token, the token exception will be thrown, otherwise a success message will be printed in the console.

Write containers to files

This method calls the write method from the PIF and writes the symbol table's string representation to a file.

Class diagram