

ALLOCATE CURSOR statement

The given code represents a simple compiler implementation for performing lexical, syntax, semantic analysis, code generation, and code optimization for a specific grammar.

The main class is defined in the **Main** class within the **org.example** package. It initializes the lexical analysis phase by creating an instance of the **Lexical** class.

The **Lexical** class, also in the **org.example** package, handles the lexical analysis phase. It takes input from the user for a grammar, performs tokenization, and identifies different elements of the grammar such as keywords, identifiers, types, operators, symbols, etc. It then creates an instance of the **Syntax** class to move to the syntax analysis phase.

The **Syntax** class, in the same package, performs the syntax analysis phase. It checks if the given grammar follows a specific pattern for an "ALLOCATE CURSOR" statement. If the grammar matches the expected pattern, it outputs a valid statement message along with a parse tree. Otherwise, it outputs syntax errors related to the incorrect grammar structure.

The **Semantic** class, also in the same package, handles the semantic analysis phase. It checks if the grammar is semantically valid based on some conditions. In this case, it checks if the **tableXYZ** is not null and if the provided index in the grammar is within the range of the table's length. If the conditions are met, it outputs a valid statement message and creates an instance of the **Generation** class.

The **Generation** class, in the same package, performs the code generation phase. It retrieves a specific value from the **tableXYZ** based on the provided index in the grammar and outputs it. If the code generation is successful, it creates an instance of the **Optimization** class.

The **Optimization** class, in the same package, represents the code optimization phase. In this implementation, it simply outputs a message stating that no code optimization can be applied to the given statement.

Overall, this code provides a basic framework for performing lexical, syntax, semantic analysis, code generation, and code optimization for a specific grammar pattern related to the "ALLOCATE CURSOR" statement.