

**1. \*\*Regular Expressions:\*\***

- ``digit [0-9]*``: This defines a regular expression for matching zero or more digits.
- ``letter [a-zA-Z]``: This defines a regular expression for matching a single letter.
- ``id {letter}({letter}|{digit})*``: This defines a regular expression for matching identifiers. An identifier starts with a letter and can be followed by zero or more letters or digits.
- ``int_num {digit}+``, ``uint_num 0|({int_num})``: These regular expressions define signed and unsigned integers. An unsigned integer can be either 0 or a sequence of one or more digits.

**2. \*\*Floating-Point Numbers:\*\***

- ``float_num ({int_num}\.{digit}+)|({int_num}\.)(\.{digit}+)``: This regular expression matches different forms of floating-point numbers. It can be an integer part followed by a decimal point and one or more digits (``{int_num}\.{digit}+``), an integer part followed by just a decimal point (``{int_num}\.``), or just a decimal point followed by one or more digits (``\.{digit}+``).

**3. \*\*Exponential Notation:\*\***

- ``exp_num ({int_num}|{float_num})[eE][+-]?{int_num}``: This regular expression matches numbers in exponential notation. It can be an integer or float part followed by ``e`` or ``E``, an optional ``+`` or ``-``, and then one or more digits.

**4. \*\*Tokens and Actions:\*\***

- The section after the ``%%`` delimiter contains rules for recognizing various tokens.
- For example, ``"/`` is a pattern to match a double forward slash, and the action ``{scom=1;}`` sets the single-line comment flag to 1.
- Keywords, relational operators, assignment operator, etc. are recognized based on the provided patterns.

**5. \*\*Ignoring Comments:\*\***

- ``/* ... */`` style comments are ignored using the rules for ``"/`` and ``"*/``.
- Single-line comments are ignored using the rule for ``"/``.

**6. \*\*Printing and Storing:\*\***

- When a token is recognized, it prints a message to the output file (``yyout``) indicating the type of the token.
- Identifiers are also stored in the symbol table (``st``) if they haven't been encountered before.

**7. \*\*Main Function:\*\***

- ``main()`` opens the input and output files, calls ``yylex()`` to start the lexical analysis, and then prints the contents of the symbol table.

#### 8. **``look_up`` Function:**

- This function checks if a given identifier (``id``) is already in the symbol table.

#### 9. **``yywrap`` Function:**

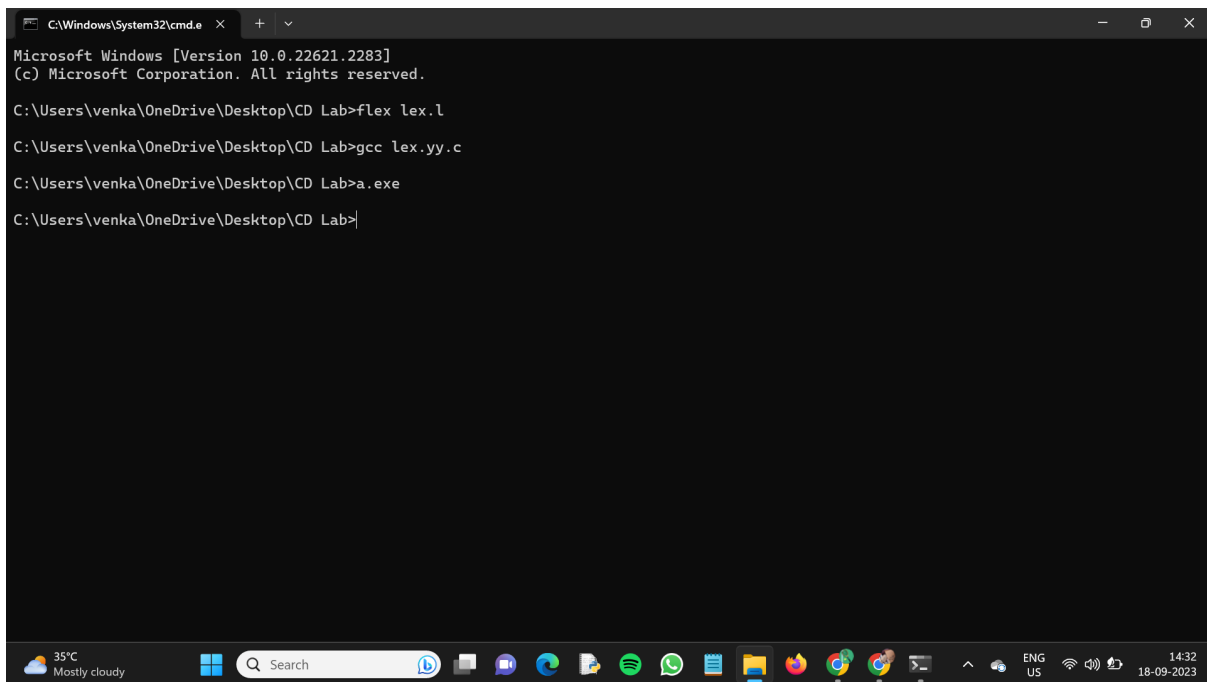
- This function is used to indicate the end of input.

#### 10. **File Handling:**

- The program reads from a file named ``x.txt`` and writes to a file named ``y.txt``.

This Lex program will tokenize the input based on the specified rules and print the results to ``y.txt``. The program also maintains a symbol table and handles different types of numeric constants and identifiers as per the provided regular expressions.

Commands to run the program :



```
C:\Windows\System32\cmd.exe
Microsoft Windows [Version 10.0.22621.2283]
(c) Microsoft Corporation. All rights reserved.

C:\Users\venka\OneDrive\Desktop\CD Lab>flex lex.l
C:\Users\venka\OneDrive\Desktop\CD Lab>gcc lex.yy.c
C:\Users\venka\OneDrive\Desktop\CD Lab>a.exe
C:\Users\venka\OneDrive\Desktop\CD Lab>
```

The screenshot shows a Windows Command Prompt window with the following text:   
C:\Windows\System32\cmd.exe  
Microsoft Windows [Version 10.0.22621.2283]  
(c) Microsoft Corporation. All rights reserved.  
C:\Users\venka\OneDrive\Desktop\CD Lab>flex lex.l  
C:\Users\venka\OneDrive\Desktop\CD Lab>gcc lex.yy.c  
C:\Users\venka\OneDrive\Desktop\CD Lab>a.exe  
C:\Users\venka\OneDrive\Desktop\CD Lab>  
The taskbar at the bottom shows the date and time as 18-09-2023 14:32, and the language as ENG US.