

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:**

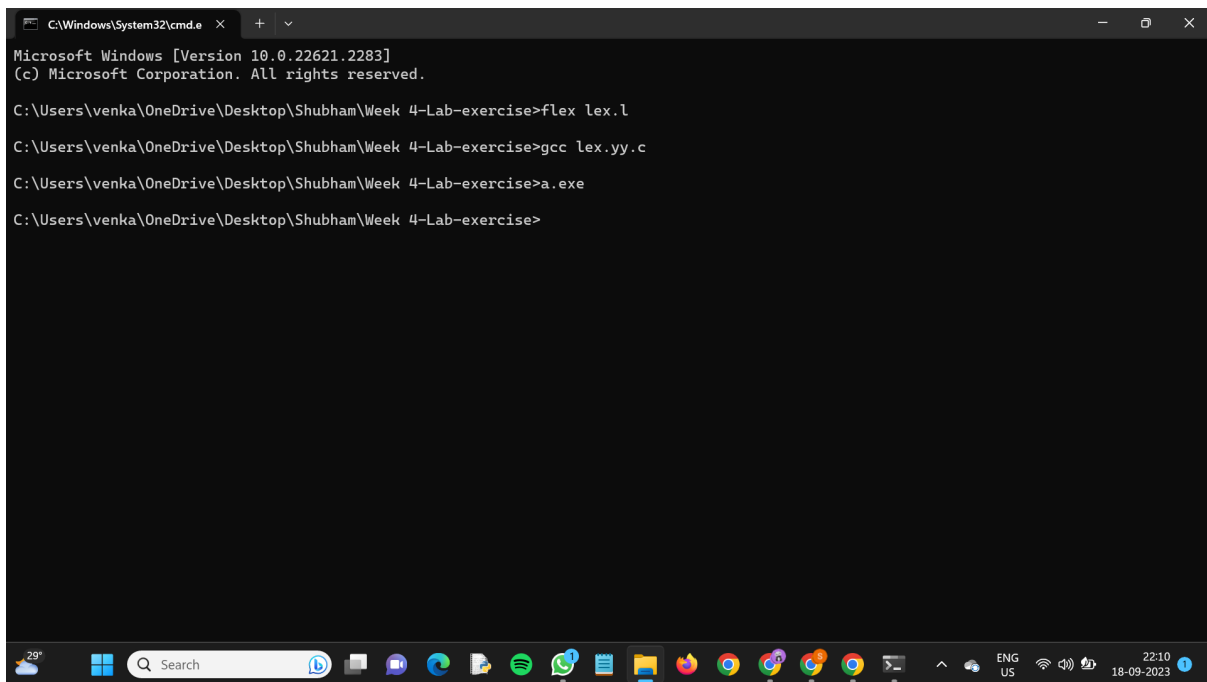
- This function is used to indicate the end of input.

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.e
Microsoft Windows [Version 10.0.22621.2283]
(c) Microsoft Corporation. All rights reserved.

C:\Users\venka\OneDrive\Desktop\Shubham\Week 4-Lab-exercise>flex lex.l
C:\Users\venka\OneDrive\Desktop\Shubham\Week 4-Lab-exercise>gcc lex.yy.c
C:\Users\venka\OneDrive\Desktop\Shubham\Week 4-Lab-exercise>a.exe
C:\Users\venka\OneDrive\Desktop\Shubham\Week 4-Lab-exercise>
```