Indian Institute of Technology Bhilai
CS251: Introduction to Language Processing
Homework-1 : Solution-Lexical Analyzer

B Sri Bhargav Ram, Deva Surya Prasad

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Language we have choosen for Compiler Design: **Java**.

Lexical Analysis: It separates streams into "lexemes" where a token is a fundamentally meaningful unit. To implement the correct computing instructions, the tokens must be isolated by the language compiler because of the way they are linked together.

Steps to Execute:

Open the Terminal in Ubuntu
1. Install flex
2. Type: flex Assign1.l
3. Type: gcc lex.yy.c
4. Type: ./a.out

You can insert Java syntax in the terminal after completing the aforementioned procedures to obtain a lexical analysis of each type of syntax.

Here, in this Assignment, I defined regular expressions and rules, at the above of the code in **Assign1.l** file. I defined following parts:

1. DataTypes
2. Control Statements
3. Keywords
4. Comments
5. String Literals
6. Char Literal
7. Identifiers
8. Function Calling
9. Integer Literals
10. Floating- point Literals

11. Unary Operators
12. Assignment Operators
13. Logical Operators
14. Relational Operators
15. Separators

I have written the above ones in the priority order in my code

And, everything from here is clearly visible and understandable from my code. I am providing one example in the prompt and attaching output of the command here:

```
devasuryaprasad@HP-Pavilion-Laptop:~/Desktop/java$ flex Assign1.l
devasuryaprasad@HP-Pavilion-Laptop:~/Desktop/java$ gcc lex.yy.c
devasuryaprasad@HP-Pavilion-Laptop:~/Desktop/java$ ./a.out
Enter as your wish:
for(int i=0;i<9;i++){ cnt += 1} { "Bhargav" is good ^ & * 4.5 if main() } =]=/
FUNCTION : for(int i=0;i<9;i++)
SYNTAX ELEMENT : {
IDENTIFIER : cnt
ASSIGNMENT OPERATOR : +=
INTEGER : 1
SYNTAX ELEMENT : }
SYNTAX ELEMENT : {
STRING_LITERAL : "Bhargav"
IDENTIFIER : is
IDENTIFIER : good
BITWISE OPERATOR : ^
BITWISE OPERATOR : &
ARITHMETIC OPERATOR : *
FLOATING_POINT : 4.5
STATEMENT : if
FUNCTION : main()
SYNTAX ELEMENT : }
ASSIGNMENT OPERATOR : =
SYNTAX ELEMENT : ]
ASSIGNMENT OPERATOR : =
ARITHMETIC OPERATOR : /
```

Small Controversy:
I have taken for(....) and if(...) as functions, as they will check the condition and evaluate according to that, I mean, they are performing same kind of operations as functions.

References:
I have referred in internet into some websites (W3 Schools, GeeksForGeeks) for Java keywords and all, as I do not use Java normally