SSN COLLEGE OF ENGINEERING, KALAVAKKAM

DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING

Compiler Design Lab – CS6612

Programming Assignment-2 - Implementation of Lexical Analyzer for the patterns (identifier, comments, operators, constants)

Due Date: 25.01.17 & 30.01.17

Develop a Lexical analyzer to recognize the patterns namely, identifiers, constants, comments and operators using the following regular expressions.

Regular Expression for Identifier	**Regular Expression for Constant**
letter → [a-zA-Z] digit → [0-9] id→letter(letter|digit)*	digit → [0-9] digits →digit digits optFrac →.digits optExp → E(+|-|ϵ) digits numberconst →digits optFrac optExp charconst → '(letter)' stringconst → "(letter)*" constant → numberconst | charconst |stringconst
Regular Expression for Comments	**Regular Expression for Operators**
start1→ * end1 → */ multi → start (letter)* end start2 → // single → start (letter)*	relop → < | <= | == | != | > | >= arithop → + | - | * | / | % logicalop → && | || | ! operator → relop | arithop | logicalop

Regular Expression for keywords	
int → int float → float char → char double → double .. .. keywords → int|float|char|double|…..	

Convert the regular expressions into cumulative transition diagram as shown in Figure 1. Each state represents a condition that could occur during the process of scanning the input looking for a lexeme that matches one of the several patterns. Convert each state into a piece of code.

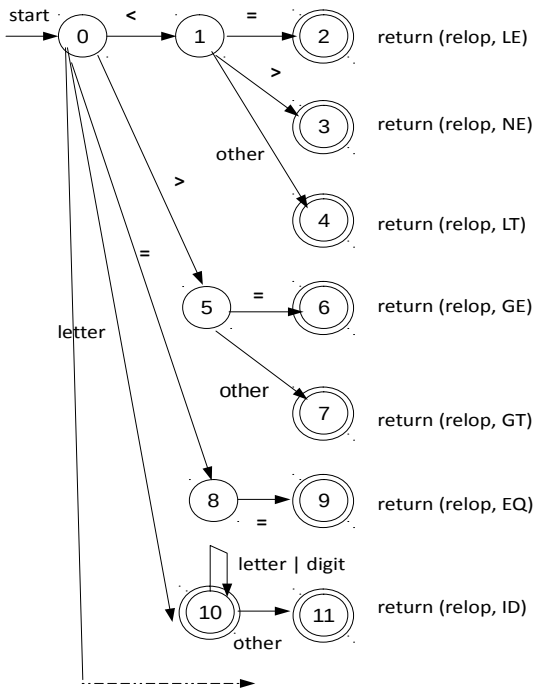

Figure 1. Cumulative Transition diagram

Develop a scanner that will recognize all the above specified tokens. Test your program for all specified tokens. Example input and output specification is given below.

Example input source program

```
main()
{
  int a=10,b=20;
  if(a>b)
     printf(“a is greater”);
   else
     printf(“b is greater”);
}
```

Output:

```
main()                  – function call
{                       - special character
int                     – keyword
a                       – identifier
=                       - assignment operator
10                      – integer constant
,                       -special character
b                       – identifier
=                       - assignment operator
20                      – integer constant
;                       - special character
if                      - keyword
(                         - special character
a                         – identifier
>                         - relational operator
b                         – identifier
)                         - special character
printf(“a is greater”)  – function call
;                         - special character
printf(“b is greater”) – function call
;                         - special character
}                         - special character
```