

Lab Assignment 2- Lexical Analysis

In this assignment, you will work on implementing a lexical analyzer in your preferred programming language. We will consider some basic constructs (e.g., if-else statements), understand what are the different tokens (and patterns for the tokens) in the considered language/constructs.

Implement a lexical analyzer (using any programming language) for the considered tokens/patterns. Your program should take a statement as input and return the sequence of tokens as output.

Let us consider the example grammar for branching statements (discussed in the class) given below:

```
stmt  →  if expr then stmt
        |  if expr then stmt else stmt
        |  ε
expr   →  term relop term
        |  term
term   →  id
        |  number
```

The patterns for the tokens in the language are described below:

```
digit  →  [0-9]
digits →  digit+
number →  digits ( . digits )? ( E [+-]? digits )?
letter →  [A-Za-z]
id      →  letter ( letter | digit )*
if      →  if
then    →  then
else    →  else
relop   →  < | > | <= | >= | = | <>
```

Implement a lexical analyzer using any programming language. Your program should take a statement as input and return the sequence of tokens as output.

- **Example Input:** if input<10 then output1=100 else output2>=100

- **Expected output:**

```
(if,)
(id,input)
(relop,<)
(number,10)
(then,)
(id,output1)
(relop,=)
(number,100)
(else,)
(id,output2)
(relop,>=)
(number,100)
```