

CSEN1002 Compilers Lab, Spring Term 2024

Task 7: ANTLR Lexical Analysis

Due: Week starting 22.04.2024

1 Objective

For this task, you need to implement a simple lexical analyzer using ANTLR (www.antlr.org). Your tutor will introduce you to ANTLR during the session, but you are urged to prepare by taking a look at the ANTLR documentation:

github.com/antlr/antlr4/blob/master/doc/index.md

2 Requirements

Using ANTLR, you will implement a lexical analyzer with the following specifications. Given an input of a non-empty string of bits, the string should be split into segments and the outputs for consecutive segments should be produced in sequence. A segment is a string of length three, but if fewer than three symbols are what is available then the segment is the string of available symbols. If the segment is the string 000, then the corresponding output is **ONE**. If the segment is any other string of length three, then the corresponding output is the result of ANDing the last two bits of the segment. If the segment is a string of length less than three, then the output is **ERROR**. Here are some illustrative examples.

Input	Output
10110	101,ZERO;10,ERROR
111000110	111,ONE;000,ONE;110;ZERO
0	0,ERROR
11	11,ERROR

3 Important Details:

- Your implementation should be done within the template file uploaded to the CMS.
- You are not allowed to change the grammar name.
- You are allowed to write as many helper fragment lexer rules within the same grammar file (if needed).
- Public test cases have been provided on the CMS for you to test your implementation.
- Please ensure that the public test cases run correctly without modification before coming to the lab to maintain a smooth evaluation process.

- A Java file is provided in order to easily test your grammar with custom strings in addition to the public test cases.
- Private test cases will be uploaded before your session and will have the same structure as the public test cases.

4 Evaluation

- Your implementation will be tested on ten input strings.
- You get one point for each correct output; hence, a maximum of ten points.
- The evaluation will take place during your lab session of the week starting Monday, April 22.

5 Online Submission

- You should submit your code at the following link.

`https://forms.gle/uJeVKoC9EeAwmw4BA`

- Submit one Java file (Task7.g4) containing executable code.
- **Online submission is due by the end of your lab session.**