German University in Cairo
Department of Computer Science
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Compilers, Spring Term 2025
Assignment 1: ANTLR Lexical Analysis

Due: April 24, by 23:59

1   Objective

For this task, you need to implement a simple lexical analyzer using ANTLR (`www.antlr.org`).
ANTLR introductory slides are available on the CMS. You are also urged to consult 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. The
input is a non-empty string of bits which should be split into segments; each segment has
a corresponding output as indicated below. The output is semi-colon-separated sequence of
comma-separated pairs, where each pair is a segment of the input with the corresponding
output.

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 `101`, then
the corresponding output is `4`. If the segment is any other string of length three, then the
corresponding output is the numerical sum the three 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
11010	110,2;10,ERROR
101111110	101,4;111,3;110,2
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).

4 Online Submission

- You should submit your code at the following link.

  https://forms.gle/tskGJzHJhEciJk8a9

- Submit one file (`Assignment1.g4`) containing executable code.