German University in Cairo
Department of Computer Science
Assoc. Prof. Haythem O. Ismail

CSEN1002 Compilers Lab, Spring Term 2024
Task 10: ANTLR Parsing II

Due: Week starting 14.05.2024

1 Objective

For this task you will use ANTLR to implement an SDT or an SDD to count the number of plateaus in a sequence of non-negative integers. A plateau in a sequence of non-negative integers is a contiguous sub-sequence of two or more identical integers.

2 Requirements

- The grammar of your SDT/SDD should generate all strings representing sequences of integers.

- A sequence of non-negative integers is represented by a (possibly empty) string of the form $a_1, a_2, \ldots, a_n$, where a_i is a sequence of digits.

- For example, the following are representations of sequences of non-negative integers.

  - 1, 4, 4, 4, 2, 2, 3
  - 23, 24, 25
  - 1
  - 546, 0, 0, 7

- In your SDT/SDD, the start variable `s` should have an attribute `val` whose value is the number of plateaus in the input sequence.

- In the example sequences above, `val` should be 2 for sequence (a), 0 for sequences (b) and (c), and 1 for sequence (d).

- **The only operations allowed on attributes are assignments, logical operations (&&, ||, !), equality checks (==, !=), and relational checks (<,>, <=, >=).**

- Important Details

  - Your implementation should be done within the template file uploaded to the CMS.
  - You are not allowed to change the grammar name, the rule name "`s`" or attribute "`val`".
  - You are allowed to write as many additional parser and 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.

3 Evaluation

- Your SDT/SDD will be tested using ten inputs.

- You get one point for each correct output; hence, a maximum of ten points.

4 Online Submission

- You should submit your code at the following link.

$$\texttt{https://forms.gle/BCqJjM8xkFgK9ARi9}$$

- Submit one file "`Task10.g4`" containing the grammar.

- **Online submission is due by the end of your lab session.**