

# CS 311: Computational Structures

## Exercise 4

James Hook

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Let  $G$  be the expression, term, factor grammar from Example 2.4 and Exercise 2.1 in Sipser. The sentential symbol is  $E$ . The rules are given:

$$\begin{array}{l} E \rightarrow E + T \\ \quad | \quad T \\ T \rightarrow T \times F \\ \quad | \quad F \\ F \rightarrow (E) \\ \quad | \quad a \end{array}$$

Show that this grammar generates the string  $a \times a + a$  by giving a **leftmost** derivation.