INTRODUCTION TO PARSING

Computational mathematics

TOP-DOWN ANALYSIS

Parsing

Introduction

- We must find a path in the tree from the root to a leaf.
- This path will indicate that there is a leftmost derivation for the string using the grammar.
- If there is no such path, the string is rejected.

Optimization

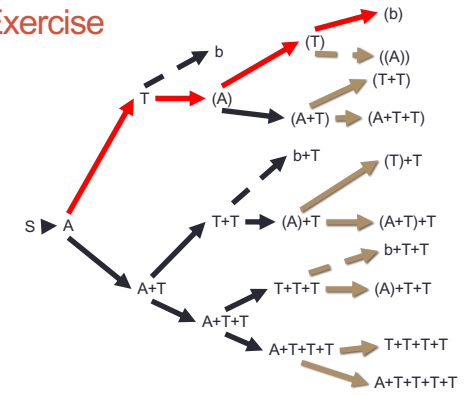
- To limit the search, prefixes (terminal prefixes) will be used to identify the nodes that have the possibility to continue with the search and remove those that do not lead to a successful search.

Exercise

- Given the following grammar
  1. S→A
  2. A→T | A+T
  3. T→b
  4. T→(A)

Build the tree resulting from the tracking of the previous algorithm for the top-down syntactic analysis of the string (b)

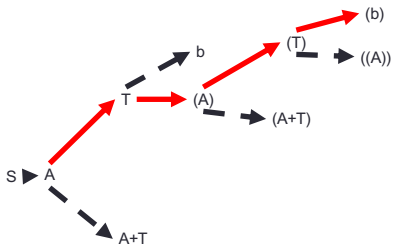
Exercise



When to finish?

- For the string (b), it can be said that the lowest branch of the tree is useless when a + is found in the strings that are derived.
- Therefore, that branch can be ignored from the since level

When to finish



Remark

- Top-down parsing builds a derivation for any string in the language.
- In spite of this, a grammar with several rules or with rules with bodies with several symbols would make the tree grow quickly.
- Always, we will look for a deterministic search.