

Depth-First Top-Down Parsing Algorithm

Input: context-free grammar $G = (N, T, P, S)$

string $p \in T^*$

Stack K

1. $PUSH([S, 0], K)$

2. repeat

2.1. $[q, i] := POP(K)$

2.2. $dead-end := false$

2.3. repeat

Let $q = uAv$ where A is the leftmost variable in q .

2.3.1. if u is not a prefix of p then $dead-end := true$

2.3.2. if there is no A rule numbered greater than i then $dead-end := true$

2.3.3. if not $dead-end$ then

Let $A \rightarrow w$ be the first A rule with number greater than i and

let j be the number of this rule

2.3.3.1. $PUSH([q, j], K)$

2.3.3.2. $q := uwv$

2.3.3.3. $i := 0$

end if

until $dead-end$ **or** $q \in T^*$

until $q = p$ or $EMPTY(K)$

3. if $q = p$ then accept else reject