Appendix: The arc-standard transition system

Transition set $\mathcal{T}$:

SHIFT	move one item from the buffer to the stack: $(\Sigma,\ i\|B,\ A) \Rightarrow (\Sigma\|i,\ B,\ A)$
LEFT-ARC	create arc $j \rightarrow i$ and remove i: $(\Sigma\|i\|j,\ B,\ A) \Rightarrow (\Sigma\|j,\ B,\ A \cup \{(j,i)\})$ Condition: $i \neq 0$
RIGHT-ARC	create arc $i \rightarrow j$ and remove j: $(\Sigma\|i\|j,\ B,\ A) \Rightarrow (\Sigma\|i,\ B,\ A \cup \{(i,j)\})$

Initial configuration:

$$c_s(w_1, w_2, w_3, \ldots,) = ([ROOT], [1, 2, 3, \ldots], \emptyset)$$

Terminal configuration:

$$c_t = ([ROOT], [], A)$$

Legend:

Σ	stack
B	buffer
A	set of arcs constructed so far
i, j	two items at the top of the stack (j is the top)
$ROOT$	the root node of the tree

A configuration is written as (Σ, B, A).