

Instantaneous Description

A configuration or an instantaneous description (ID) of PDA at any moment during its computation is an element of $Q \times \Sigma^* \times \Gamma^*$ describing the current state, the portion of the input remaining to be read (i.e. under and to the right of the read head), and the current stack contents. Only these three elements can affect the computation from that point on and, hence, are parts of the ID.

The start or initial configuration (or ID) on input w is (q_0, w, z_0) . That is, the PDA always starts in its start state, q_0 with its read head pointing to the leftmost input symbol and the stack containing only the start/initial stack symbol, z_0 .

Moves

Let the symbol “ \vdash ” denote a move of the PDA, and suppose that

$\delta(q_1, a, x) = \{(q_2, y), \dots\}$, then the following is possible:

$$(q_1, aW, xz) \vdash (q_2, W, yz)$$

where W indicates the rest of the string following ‘ a ’ and Z indicates the rest of the stack contents underneath the x .