

## W4L1: Context-free language

(pg.8, context free language)

$$L = \{0^n 1^n : n \in \mathbb{N}\}$$

- $\epsilon \in L$
- $f(0011) \xrightarrow{\omega=0011} f(01) \xrightarrow{\omega=01} f(\epsilon)$
- Above is an example of “snapshotting”, recursively descend down the syntax process until we reach  $\epsilon$ , or irreducible.
  - Notice that this is just a stack execution
- The above is an example of PDA -  $\epsilon$ -NFA with a stack memory

### Check pg.27 for proper PDA example

Exercise: Formal definition of PDA

- tuple:
- $Q$  is finite set of states
- Input and stack alphabet ( $\Sigma$ )
- Init and accepting state ( $q_0 \in Q, F \subseteq Q$ )
- Transitions  $\delta = Q \times \Sigma_\epsilon \times \Gamma_\epsilon \rightarrow 2^{Q \times \Gamma_\epsilon}$