

Theorem 7.4.3 (Pumping Lemma for Context-Free Languages)

Let L be a context-free language. There is a number k , depending on L , such that any string $z \in L$ with $\text{length}(z) > k$ can be written $z = uvwxy$ where

(i). $\text{length}(uwx) \leq k$,

(ii). $\text{length}(v) + \text{length}(x) > 0$,

(iii). $uv^iwx^iy \in L$ for $i \geq 0$