

RGPV 2020

Preve that CFL are not closed under intersection ?

If L1 and L2 are two context free languages, their intersection $L1 \cap L2$ need not be context free.

For example,

$$L1 = \{ a^n b^n c^m \mid n \geq 0 \text{ and } m \geq 0 \}$$

L1 says number of a's should be equal to number of b's.

$$L2 = \{ a^m b^n c^n \mid n \geq 0 \text{ and } m \geq 0 \}$$

L2 says number of b's should be equal to number of c's.

$$L3 = L1 \cap L2 = \{ a^n b^n c^n \mid n \geq 0 \}$$

L1 intersection L2 says both conditions need to be true.

But push down automata can compare only two. So it cannot be accepted by pushdown automata, hence not context free.

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