

## RGPV 2020

### Preve that CFL are not closed under intersection ?

If  $L_1$  and  $L_2$  are two context free languages, their intersection  $L_1 \cap L_2$  need not be context free.

For example,

$$L_1 = \{ a^n b^n c^m \mid n \geq 0 \text{ and } m \geq 0 \}$$

$L_1$  says number of a's should be equal to number of b's.

$$L_2 = \{ a^m b^n c^n \mid n \geq 0 \text{ and } m \geq 0 \}$$

$L_2$  says number of b's should be equal to number of c's.

$$L_3 = L_1 \cap L_2 = \{ a^n b^n c^n \mid n \geq 0 \}$$

$L_1 \cap L_2$  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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