

## Unit C5 Supplement, 3/29/05

### Slide 4: $ww^R$ is not regular

After looking at the slide again, I realized that the slide is correct. The key is to choose  $ww^R = 0^k 1 u u^R 1 0^k$  where  $k > n_0$ . This way,  $xy$  falls on the first  $0^k$ . By pumping  $y$  (e.g.,  $y^2$ ), we introduce additional 0's, which will conflict with the 1 preceding the last  $0^k$ .

### Slide 12: Group Exercise 1 Problem A. $\{0^i 1^j 2^k \mid i = j + k\}$

The question was as follows. By choosing  $w$  in a way  $bcd \leq i$ , the falsifier could show that any decomposition of  $w$  would destroy the context-freeness. Wouldn't it suggest that the language is not context-free?

The Pumping Lemma for CFLs is slightly different from the version for regular languages in that the span of  $bcd$  can move around more flexibly due to the lack of constraints on  $a$ . So, for this case, the verifier will be able to slide  $bcd$  so that  $b$  and  $d$  would fall on parts of 0 and 1, respectively, to allow arbitrary pumping.

// End