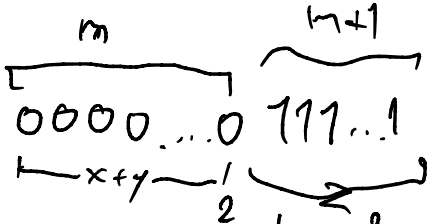
(Homework 5)

*3. $L3 = \{ 0^i 1^j : i \geq j \}$

- Assume that L3 is regular. Let m be the number of states in DFA
- we pick a string $w \in L_3, |w| \geq m \Rightarrow w = 0^m 1^m$



- Oppenent decomposes w into xyz, $|xy| \leq m$, $|y| \geq 1$
- We pick $i = 0$ to pump $xy^i z$, the result is $0^{m+k} 1^{m-1}$ where $k = |y|$ and $k \geq 1$.
- Since $m+k \geq m-1$, $0^{m+k} 1^{m-1} \notin L3$.
- L3 is not regular language