

HW1 Show that all binary strings generated by the grammar with the following productions have values divisible by 3

$$S \rightarrow 11 \mid 1001 \mid S0 \mid SS$$

Check if every string is divisible by 3

$$\begin{array}{l} \text{Ex: } 11 \text{ is divisible by } 3 \\ 1001 \text{ is divisible by } 3 \end{array} \left. \begin{array}{l} \Rightarrow S \equiv 3 \\ \Rightarrow S \equiv 3 \end{array} \right\} \Rightarrow S0 \text{ is divisible by } 3$$

$$S0 = S \cdot 2$$

$$SS = S \cdot (2^k) = S \cdot (2^k) + S = S \cdot (2^k + 1)$$

All values are divisible by 3