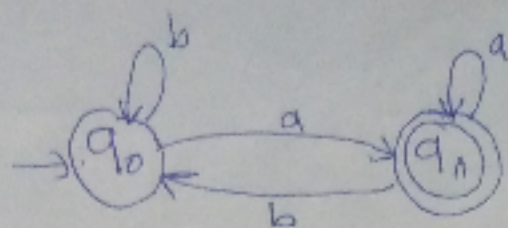


$$\sum_{i=1}^n x_i = 6$$



- DFA $\rightarrow$ RE (using equation system technique):

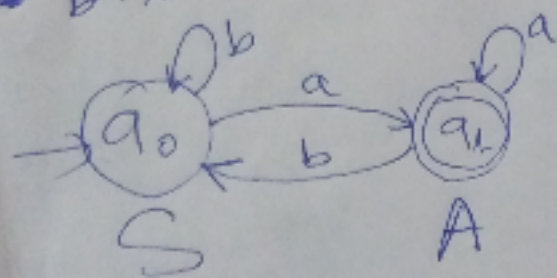
$$\begin{cases} q_0 = bq_0 + aq_1 \\ q_1 = aq_1 + bq_0 + \epsilon \end{cases} \quad \text{According to Arden's Theorem} \Rightarrow q_1 = a^*(bq_0 + \epsilon)$$

We replace q_1 in the first equation:

$$q_0 = bq_0 + aa^*(bq_0 + \epsilon) = (b + aa^*b)q_0 + aa^*\epsilon$$

$$\Rightarrow \boxed{q_0 = (b + aa^*b)^* aa^*}$$

- DFA $\rightarrow$ Grammar



$$S \rightarrow bS \mid aA$$

$$A \rightarrow aA \mid bS \mid \epsilon$$