1. Let $\Sigma = \{a, b, c\}$ and $L_1 = \{w \in \Sigma^* \mid w \text{ does not contain the substring } abc\}$.
   Design a DFA which accepts $L_1$. Show your solution as a transition graph and explain clearly why it is correct.

2. Show that $L_3 = \{a^n \mid n \geq 4\}$ is regular.

3. Let $\Sigma = \{a, b, c\}$ and let $L = \{a^ib^jc^k \mid i, j, k \in \mathbb{N}_0\}$.
   Design an NFA which accepts $L$. Show your solution as a transition graph and explain clearly why it is correct.

4. Convert the NFA above into an equivalent DFA. Use the procedure NFA2DFA in the textbook and course slides. Express your solution as a transition graph, and show the main steps in the solution process.