COS 210 Worksheet 2

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Denkleiers • Leading Minds • Dikgopolo tša Dihlalefi

- This worksheet consists of **4 questions** for a total of **12 marks**.

Question 1 .... (2 marks)
Show that the language A over $\Sigma = \{0, 1\}$ is regular by constructing (drawing) a **deterministic** finite automaton M with $L(M) = A$.

$$A = \{w : w \text{ starts with 1 and ends with 0}\}.$$

Question 2 .... (2 marks)
Show that the language A over $\Sigma = \{0, 1\}$ is regular by constructing (drawing) a **deterministic** finite automaton M with $L(M) = A$.

$$A = \{w : w \text{ starts with 0 and has an odd length or starts with 1 and has an even length}\}.$$

Question 3 .... (4 marks)
Show that the language A over $\Sigma = \{0, 1\}$ is regular by constructing (drawing) a **deterministic** finite automaton M with $L(M) = A$.

$$A = \{w : w \text{ contains an even number of 0's or contains exactly two 1's}\}.$$

Question 4 .... (4 marks)
Show that the language A over $\Sigma = \{a, b\}$ is regular by constructing (drawing) a **deterministic** finite automaton M with $L(M) = A$.

$$A = \{w : w \text{ is a string of length } n > 1 \text{ where the first and the last symbol are different from each other}\}.$$