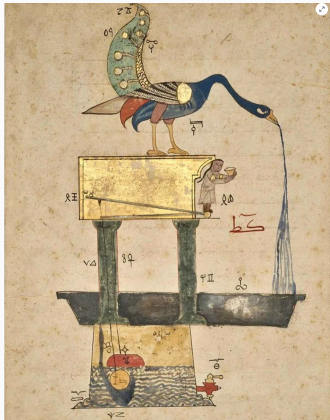


Games, graphs, and machines



September 16, 2025

Building trickier regexes

Find regular expressions that describe the following languages.

1. $\{w \mid 0 \text{ and } 1 \text{ alternate in } w\}$
2. $\{w \mid \text{every } 0 \text{ in } w \text{ has } 1 \text{ on its left and on its right}\}$.
3. $\{w \mid w \text{ has an even number of } 0\text{s}\}$

Building automata

Construct a DFA whose language is $\{0, 1\}$.

Building automata

Construct a DFA with the same language as 01^* .

Building automata

Construct a DFA with the language

$\{w \mid w \text{ has an even number of 0s}\}$.

Building automata

Construct a DFA with the language

$\{w \mid 0 \text{ and } 1 \text{ alternate in } w\}$.

Even trickier languages

Can you find regexes or DFAs that describe the following languages?

1. $\{w \mid w \text{ has as many 0s as 1s}\}$.
2. $\{w \mid w \text{ is a palindrome}\}$.