Example of Deterministic Finite Automata

\[(abc^*)^+\]

Construct a DFA to accept a string containing a zero followed by a one

Construct a DFA to accept a string containing two consecutive zeroes followed by two consecutive ones

Construct a DFA to accept a string containing even number of zeroes and any number of ones
Construct a DFA to accept all strings which do not contain three consecutive zeroes

Construct a DFA to accept all strings containing even number of zeroes and even number of ones

Construct a DFA to accept all strings which satisfies \( \#(x) \mod 5 = 2 \)

Construct a DFA to accept all strings \((0+1)^*\) with an equal number of 0's & 1's such that each prefix has at most one more zero than ones and at most one more one than zeroes
All strings that contain exactly 4 0s.

All strings ending in 1101.

All strings containing exactly 4 0s and at least 2 1s.

All strings whose binary interpretation is divisible by 5.

All strings that contain the substring 0101.
All strings that start with 0 and has odd length or start with 1 and has even length.

All strings that don't contain the substring 110.

All strings of length at most 5.

All strings where every odd position is a 1.

Let \( D = \{ w \mid w \text{ contains an equal number of occurrences of 01 and 10} \} \)
\[ 1*01*0(0+1)^* \]

\[ (0+1)^*(00+11+10) + \land + 0 + 1 \]

\[ (00+11)(0+1)^* + (0+1)^*(00+11) \]

\[ (1+01)^*(0+\land) \text{ or } (0+\land)(1+10)^* \]

\[ 1*(01*01^*)^* \]
$$(1+01)^* (\land + 0 + 00) (1+10)^*$$

$$(1+011)^*$$

$$(0+1)^* \ 11 \ (0+1)^* \ 010 \ (0+1)^* + (0+1)^* \ 010 \ (0+1)^* \ 11 \ (0+1)^*$$

$$(10+11)^*$$
\[(1+10+110)^*0\]

\[1(01+10)^* + 0 (11+10)^*\]

\[1(1+ 10)^* + 10(0+01)^*\]

\[(010+00)^* (10)^*\]
\{w : \text{the length of } w \text{ is at most 5}\}

\{w : w \text{ is any string except 11 and 111}\}

\{w : w \text{ contains at least two 0s and at most one 1}\}

\{w : w \text{ does not contain the substring 110}\}
\{w : each 0 in w is immediately preceded and immediately followed by 11\}

\{w : w has neither 00 nor 11 as a substring\}

\{w : w has both 01 and 10 as substrings\}

\{w : w contains an equal number of occurrences of the substrings 01 and 10\}