\[ \rightarrow \begin{array}{c} 0 \rightarrow 0 \rightarrow 0 \rightarrow 0 \end{array} \]

\[ \text{Wl the number of Os in } w \text{ is a multiple of } 3 \]

\[ p = 3 \]

because the DFA above has 3 states

\[ |x|y| \leq 3 \]

\[ \begin{align*}
  x &= 11 \\
  y &= 011100 \\
  z &= 011100
\end{align*} \]
\[ A = \sum_{n=0}^{\infty} 0^n 1^n \text{ not regular} \]

\[ \begin{array}{c}
\text{Consider } xyyz \\
\text{xxyz } \notin A \\
\text{more generally, } y \text{ must contain one more 0s}
\end{array} \]

so \( xyyz \notin A \) since there are more 0s than 1s
\[ B = \{ 0^i \mid i \geq j \} \]

Show not regular

Candidate \( 0^{A+1}1^P \)

\[
\begin{align*}
  x &= 0 \\
  y &= 0^A 0^A \\
  z &= 0^1 1^P
\end{align*}
\]

\[ xz \notin B \]

More generally, \( y \) must contain 1 or more 0s

So \( xy^0z \notin B \) since the number of 0s is now \( \geq 1 \)