CSC 4170 In-class Exercises – 1. Finite Automata

\( A = \{w \mid w \text{ is a string of 0s whose length is divisible by 2}\} \)

\( B = \{w \mid w \text{ is a string of 0s whose length is divisible by 3}\} \)

\( X = \{w \mid w \text{ is a string of 0s whose length is divisible neither by 2 nor by 3}\} \)

Construct DFA’s recognizing: 

formal definition: \((Q, \Sigma, \delta, s, F)\)

\[
A \quad M_A =
\]

\[
B \quad M_B =
\]
Construct DFA's recognizing: formal definition: \((Q, \Sigma, \delta, s, F)\)

\[ A \cap B \]

\[ M_{A \cap B} = \]

\[ A \cup B \]

\[ M_{A \cup B} = \]

\[ X \]

\[ M_X = \]
Construct a DFA recognizing $A \cup B$ again, using a Cartesian product construction.

**Hint:** You have $M_A$ recognizing $A$ and $M_B$ recognizing $B$. Construct $M$ using the definitions of $M_A$ and $M_B$ (see page 46 in textbook).

**Diagram:**

**Formal definition:**

3. How would we modify our work for the previous question for $A \cap B$?