CS 454: Theory of Computation
Problem Solving Session   #01

Questions

Design the following DFAs

Q1. Alphabet $\Sigma = \{0, 1\}$. Accepts strings with odd number of 1's.

Q2. Alphabet $\Sigma = \{a, b, c\}$. Accepts strings that include *aab* as a substring.

Q3. Alphabet $\Sigma = \{a, b\}$. Accepts any strings that include *aababba* as a substring.

Q4. Alphabet $\Sigma\{a, b, /, *\}$. Accepts strings inside C-style comments. e.g. accepts $/ * abab * /$ but rejects $ab * /$.

Q5. * Alphabet $\Sigma = \{a, b, /, *\}$. Accepts strings that are not inside C-style comments.

Q6. Alphabet $\Sigma = \{0, 1\}$. Accepts any strings with two consecutive zeros.

Q7. Alphabet $\Sigma = \{0, 1\}$. Accepts all strings that start with 00.

Q8. Alphabet $\Sigma = \{a, b\}$. Accepts all strings where *a*s and *b*s alternate.

Q9. Alphabet $\Sigma = \{a, b\}$. Accepts all strings that start and end with the same symbol, i.e., $L = \{w | w \in \Sigma^*, w = a\{a, b\}^* a \bigcup b\{a, b\}^* b\}$.

Q10. Alphabet $\Sigma = \{a, b\}$. Accepts strings that have at least one *a* and exactly 2 *b*s.

Q11. Alphabet $\Sigma = \{a, b\}$. Accepts the language $L = \{w || w | mod3 = 0\}$.

Q12. Alphabet $\Sigma = \{a, b\}$. Show that the language $L = \{vwv | v, w \in \Sigma^*, |v| = 2\}$.