

CS3311 Homework 5

Due: Wednesday, February 15, 2017, by class time, 12:05pm

Submission: Typed, pdf on Canvas
(scanned submissions are not allowed)

The answers must be the original work of the author. While discussion with others is permitted and encouraged, the final work should be done individually. You are not allowed to work in groups. You are allowed to build on the material supplied in the class. Any other source must be specified clearly.

1. (100 points, 10+15 points each)

For each of the following languages:

- (i) Construct a regular expression that describes the language, and
- (ii) Build a DFA that accepts the described language. Explain how the machine works.
The machine is 10 points, accompanying “comments” are 5 points.

(a) The empty set (over $\{a, b\}$).

(b) The empty string (over $\{a, b\}$).

(c) The strings that begin with a, and do not contain 'bc' over $\{a, b, c\}$.

(d) $\{w \mid w \in \{a, b\}^*, w \text{ starts and ends with the same symbol, and } w \neq \lambda\}$