CS 360
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Regular expression identities

1. $L + M = M + L$
2. $(L + M) + N = L + (M + N)$
3. $(LM)N = L(MN)$
4. $\emptyset + L = L + \emptyset = L$
5. $\epsilon L = L\epsilon = L$
6. $\emptyset L = L\emptyset = \emptyset$
7. $L(M + N) = LM + LN$
8. $(M + N)L = ML + NL$
9. $L + L = L$
10. $(L^*)^* = L^*$
11. $\emptyset^* = \epsilon$
12. $\epsilon^* = \epsilon$
13. $(xy)^*x = x(yx)^*$
14. The following are all equivalent:
    (a) $(x + y)^*$
    (b) $(x^* + y)^*$
    (c) $x^*(x + y)^*$
    (d) $(x + yx^*)^*$
    (e) $(x^*y^*)^*$
    (f) $x^*(yx^*)^*$
    (g) $(x^*y)^*x^*$