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CS 225: Discrete Structures in CS

Quiz 6/7

#1.

$d_0 = 2$

$d_1 = 3(2) + 2 = 3^2 + 2$

$d_2 = 3(3^2 + 2) + 2 = 3^3 + 3 * 2 + 2$

$d_3 = 3(3^3 + 3 * 2 + 2) + 2 = 3^4 + 3^2 * 2 + 3 * 2 + 2$

$d_{k=}3_{k-1} + 2 = \sum_{i=0}^{n-2} 3^i$

$5 * 3^{n-1} - 2$

#2a.

BASE: The null string ∈ S

RECURSION: If s ∈ S, then s0 ∈ S, 0s ∈ S, s1 ∈ S, 1s ∈ S

RESTRICTION: Nothing is in S other than objects defined above

b.

BASE: The null string ∈ S

RECURSION: if s ∈ S, then s1 ∈ S, 0s1 ∈ S, s01 ∈ S

RESTRICTION: Nothing is in S other than objects defined above

#5a.

N(A) = multiples of 2 = 1000/2 = 500

N(B) = multiples of 7 = 1000/7 = 142

N(A ∩ B) = 1000/14 = 71

N(A ∪ B) = 500 + 142 – 71 = 571 integers with multiples of 2 or 7

b.

1000 – 571 = 429 integers neither