Section 8.1

7.

a) Find a recurrence relation for the number of bit strings of length n that contain a pair of consecutive 0s.

an = an-1 + an-2 + 2n-2 for n >= 2

b) What are the initial conditions?

a0 = 0, a1 = 0

c) How many bit strings of length seven contain two consecutive 0s?

a2 = 0 + 0 + 22-2 = 1

a3 = 1 + 0 + 23-2 = 3

a4 = 3 + 1 + 24-2 = 8

a5 = 8 + 3 + 25-2 = 19

a6 = 19 + 8 + 26-2 = 43

a7 = 43 + 19 + 27-2 = 94

Thus, there are 94 bits strings of length seven contain two consecutive 0s.