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CS 4480 - Homework Assignment 9

P1

The output is achieved by multiplying each code bit by the data bit, as shown in the following table (note that a data bit with a value of 0 is represented as -1 for mathematical convenience).

With a code of (1, -1, 1, -1, 1, -1, 1, -1), the output for the data bits is:

data bits	$d_1 = -1$	$d_0 = 1$
output	-1, 1, -1, 1, -1, 1, -1, 1	1, -1, 1, -1, 1, -1, 1, -1

P5

- a. Thanks to CSMA/CA, the 802.11 protocol will not completely break down. If two stations transmit at the same time, they will not receive a link-layer acknowledgement from their APs. As a result, they will back off for a random amount of time (calculated using the binary exponential backoff algorithm) and count down until their next attempt. They will only attempt transmission again when the channel is sensed idle and after their particular countdown is finished (and when they sense that the channel is busy, they freeze their countdowns).
- b. My answers don't actually change. Even if the ISPs begin using different channels for their APs, each ISP will still have many clients using their channels, and those clients will continue to use CSMA/CA as described above.

P6

Stations freeze their transmission countdowns while they sense that the channel is busy. If a single station could immediately transmit its next frame after finishing its current frame, then that station would totally dominate the channel. By forcing each station to back off for a random amount of time after frame transmission, CSMA/CA allows all stations to effectively share the channel in a way that is more or less fair to everyone.