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HW 6

This week's homework will consist of 4 problems:

P1, P2, and P3 on page 585 (Figure 6.5 is on page 529; Figure 6.6 is on page 531)

P1. Consider the single-sender CDMA example in Figure 6.5. What would be the sender’s output (for the 2 data bits shown) if the sender’s CDMA code were (1, –1, 1, –1, 1, –1, 1, –1)?

If the sender’s output would be Zi,m = di \* cm 🡪 d1=-1, d0=1

d0 = (-1, 1, -1, 1, -1, 1, -1, 1)

d1 = (1, -1, 1, -1, 1, -1, 1, -1)

P2. Consider sender 2 in Figure 6.6. What is the sender’s output to the channel (before it is added to the signal from sender 1), Z2i,m ?

Z1i,m d20 = (1, -1, 1, 1, 1, -1, 1, 1)

Z1i,m d21= (1, -1, 1, 1, 1, -1, 1, 1)

P3. Suppose that the receiver in Figure 6.6 wanted to receive the data being sent by sender 2. Show (by calculation) that the receiver is indeed able to recover sender 2’s data from the aggregate channel signal by using sender 2’s code.

d1i = Σ Zi,m \* c1m

M

d12 = -2 \* -1 + 2 \* 1 + 2 \* 1 + 2 \* 1 / 8

d12 = 1

d22 = 2 \* 1 + 2 \* 1 + 2 \* 1 + -2 \* -1 / 8

d22 = 1

P5. Suppose there are two ISPs providing WiFi access in a particular café, with each ISP operating its own AP and having its own IP address block.

a. Further suppose that by accident, each ISP has configured its AP to operate over channel 11. Will the 802.11 protocol completely break down in this situation? Discuss what happens when two stations, each associated with a different ISP, attempt to transmit at the same time.

No, 802.11 will no break down since the SSID and mac address is of every AP is different. If two stations attempt to transmit at the same time both AP’s will receive the frame but only the correct one will process it. If the two AP’s are sharing the same bandwidth, performance will be bogged down because there will be collisions.

b. Now suppose that one AP operates over channel 1 and the other over channel 11. How do your answers change?

802.11 still will still not break and but, since there are fewer collisions the performance will be better.