

PN Sequences and Spread-Spectrum

Exercise 1: How many bits are there in an m-sequence for $m = 6$?
How many are 1's? How many are 0's?

Exercise 2: If the initial value of each flip-flop is 1, what are the values of the next 4 bits output by the right-most flip-flop?

Exercise 3: How many flip-flops would be required to generate a ML PRBS of period 8191? How many ones would the sequence have? What is the longest sequence of 0's?

Exercise 4: Derive H_2 and H_4 . Show that the first two rows and last two columns of each matrix are orthogonal.

Exercise 5: Spread the value a with H_{4_0} (equal to H_1) and the value b with H_{4_3} . Add the spread sequences and then de-spread them. Do you get back the original values?

Exercise 6: Consider a 30 kHz signal. What is the SIR if a jammer is transmitting on the same frequency with equal received power? If the jammer is on a different frequency? What is the SIR if DSSS with a spreading factor of 100 is used? Does the SIR depend on the jammer's frequency?

Exercise 7: Why do all the downlink codes have the same delay?
Why do different user's uplink signals have different delays?

Exercise 8: Is BT FFH or SFH?