Lecture 12 - PN Sequences and Scramblers

Exercise 1: How many flip-flops would be required to generate a ML PRBS of period 16383? How many ones would the sequence have?

$k = 16$? No...

$2^{16} = 65536$

$\text{period} = 2^k - 1 = 16383$

$\#\text{ones} = 2^{k-1} = 8192$

$2^k - 1 = 16383 \quad 2^k = 16384 \quad k = \log_2 16384 = 14$

$\therefore$ need 14 flip-flops

Exercise 2: Why not?

- the de-scrambling algorithm is public
- anyone can de-scramble it.

Exercise 3: How many errors will appear in the output of a V.34 descrambler if there is one input error?

1 error due to channel error

1 error each time that bit is used to calculate the descrambling (2)

total of 3 errors @ output.

Exercise 4: What two signals would the receiver compare to detect errors?