Information theory and error control coding/Teoria da informação e códigos corretores de erros

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Tutorial Questions/Lista de Exercícios - 9

1. For the parity check matrix given by



a) Construct the Tanner graph for the code.

b) Determine the girth of the graph.

c) Determine the number of cycles of length 6.

d) Determine a generator matrix for this code.

2. Consider the Matlab code provided on the website of the course that simulates LDPC codes with arbitrary parameters of block length and rate using BPSK modulation and additive white Gaussian noise.

a) Plot the bit error ratio (BER) against the signal-to-noise ratio (SNR) for a range of values. Suggestion: pick 5 or 6 SNR points, use rates R = 1/2.

b) Explain what are the pros and cons of the SPA decoder.