

ECE 729 Design Project 1

Consider a discrete memoryless binary source $\{X_i\}$ with $P(X_i = 1) = p$. Suppose you need to compress n -bit sequences where $n = 5$ is specified. You are also told that the set A_n should satisfy $P((X_1, \dots, X_n) \notin A_n) < \lambda$.

Write a MATLAB script that uses specified values of p and λ to print out a list of 5-bit sequences for A_n such that $P((X_1, \dots, X_n) \notin A_n) < \lambda$. The constraint is that your list should be as short as possible. Write your script assuming $p < 1/2$.

Test your script different values of p and λ .

Values of p and λ will be given later for you to use when you turn in your results, which should include:

1. A description of your analysis and how your script works.
2. A copy of your script.
3. A copy of your script's output using the given values of p and λ .
4. Your script should also print the number of sequences you put in A_n and the value of $P((X_1, \dots, X_n) \notin A_n)$, which, of course, should be less than λ .

Due: Feb. 8, 2006