

Introduction to mathematical cryptography
Homework problems
Week 10

19. Let X, Y be independent random variables. Prove that their mutual information is zero.
20. Let \mathbf{L} be a language with 26 possible characters and with the property that for any n -gram, its relative frequency of occurrence is $1/26^n$. Compute the entropy of \mathbf{L} .

Note: Please, provide complete arguments everywhere, and explain how you arrived at your answer/solution. Giving the result without explanation leads to score deduction.