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Information Theory

Laboratory Exercise: Information Coding

- This Laboratory session is NOT assessed.
- As you proceed with this investigation, you must complete a personalized lab answer sheet and submit it before you leave this laboratory.
- You must also keep your own notes of your observations and results.

Aims: This lab session is designed to give you some practical experience of estimating information coding and entropy measures in real-life examples, and to enhance your understanding of the fundamental concepts of Information Theory in general.
Equipment: Software: Matlab.

Exercise 01: Estimate the

a) The entropy of the source X={s_1,s_2,s_3,s_4,s_5}
b) The average code length of the source X

Symbol	Probability	Code
s_1	1/2	0
s_2	1/4	10
s_3	1/8	110
s_4	1/8	111

Exercise 02: Estimate the

a) The entropy of the source X={s_1,s_2,s_3,s_4}
b) The average length for each of the source X codes

Symbol	Probability	Code I	Code II	Code III	Code IV	Code V
s_1	0.5	0	00	110	000	01
s_2	0.3	01	11	01	010	011
s_3	0.15	11	10	00	101	0111
s_4	0.05	10	01	10	111	0

Exercise 03: Given the source X={s_1,s_2,s_3,s_4,s_5},

Symbol	Probability
s_1	0.2
s_2	0.35
s_3	0.1
s_4	0.05
s_5	0.3

estimate the

a) The entropy of the source
b) The average length of the optimal code