

Homework Assignment No. 07:

**HW No. 07: Information Theory and Statistical Significance**

submitted to

Professor Joseph Picone  
ECE 8527: Introduction to Pattern Recognition and Machine Learning  
Temple University  
College of Engineering  
1947 North 12th Street  
Philadelphia, Pennsylvania 19122

April 18, 2024

prepared by:

Leo Berman  
Email: [leo.berman@temple.edu](mailto:leo.berman@temple.edu)

A. TABLE FOR PROBLEM 1

	Train	Dev	Uniform
$H(x_1)$	06.75	06.75	07.00
$H(x_2)$	06.79	06.81	07.00
$H(x_1, x_2)$	13.13	12.60	13.99
$H(x_1   x_2)$	06.35	05.79	06.99
$H(x_2   x_1)$	06.38	05.85	06.99
$I(x_1, X_2)$	00.41	00.97	00.01

**B. TABLE FOR PROBLEM 2**

Confidence [%]	Number of Samples	Minimum Error Decrease [%]
80	100	04.54
	500	02.09
	2000	01.06
	5000	01.00
	10,000	01.00
85	100	05.53
	500	02.56
	2000	01.30
	5000	01.00
	10,000	01.00
90	100	06.73
	500	03.15
	2000	01.60
	5000	01.02
	10,000	01.00
95	100	08.43
	500	04.00
	2000	02.04
	5000	01.30
	10,000	01.00

**C. SUMMARY**