

# MACHINE LEARNING FOR SIGNAL PROCESSING

LAB REPORT

## EXPERIMENT 2: LOSSLESS COMPRESSION



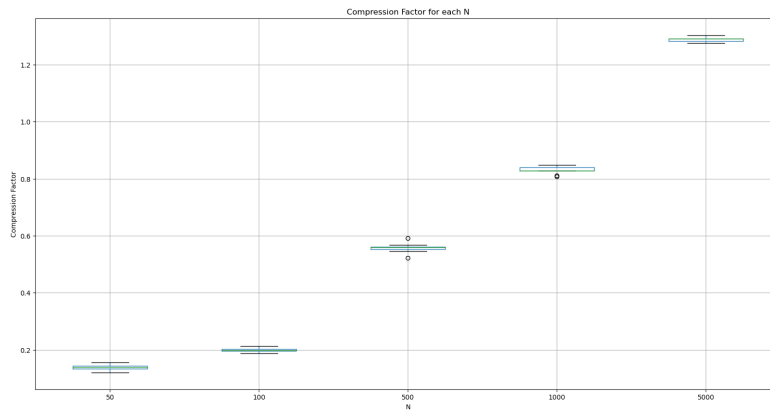
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# 1 The compression factor for 10 different text files:

	50	100	500	1000	5000
1	0.137741	0.196078	0.554324	0.810373	1.289657
2	0.155763	0.191205	0.522466	0.828500	1.303101
3	0.138889	0.198020	0.561798	0.828500	1.301406
4	0.132275	0.203252	0.558659	0.841751	1.289324
5	0.124378	0.198020	0.591716	0.848176	1.291322
6	0.143678	0.196464	0.545256	0.828500	1.290323
7	0.149701	0.212314	0.559284	0.846740	1.291656
8	0.142857	0.203666	0.551876	0.828500	1.276161
9	0.120482	0.186916	0.567537	0.807754	1.281066
10	0.134048	0.201613	0.559910	0.835422	1.278445

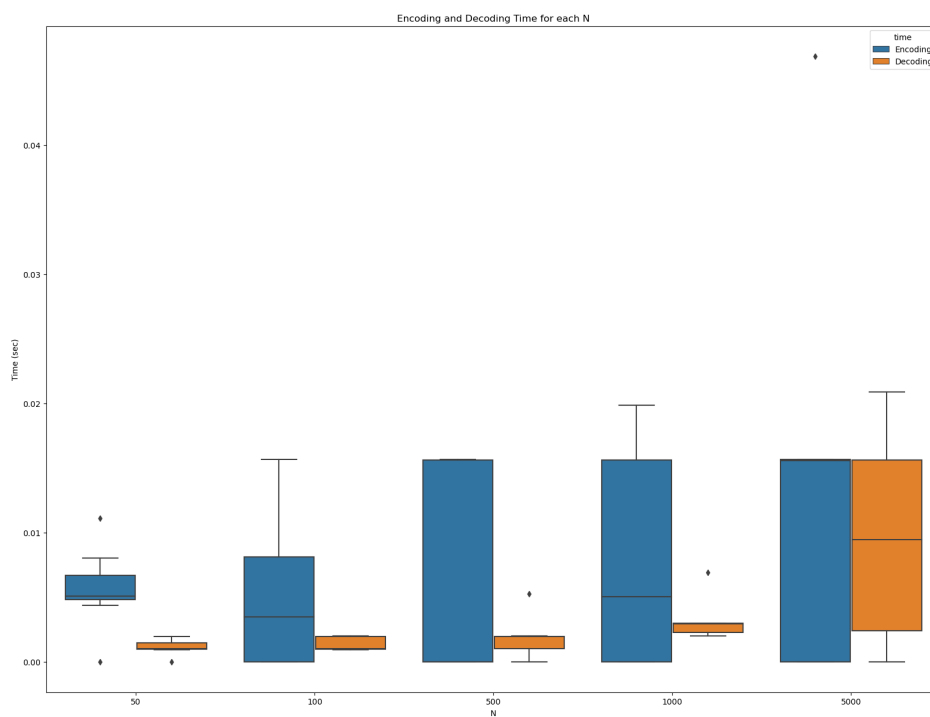
## 1.1 The variation of compression factors for each N using a notch-box plot:



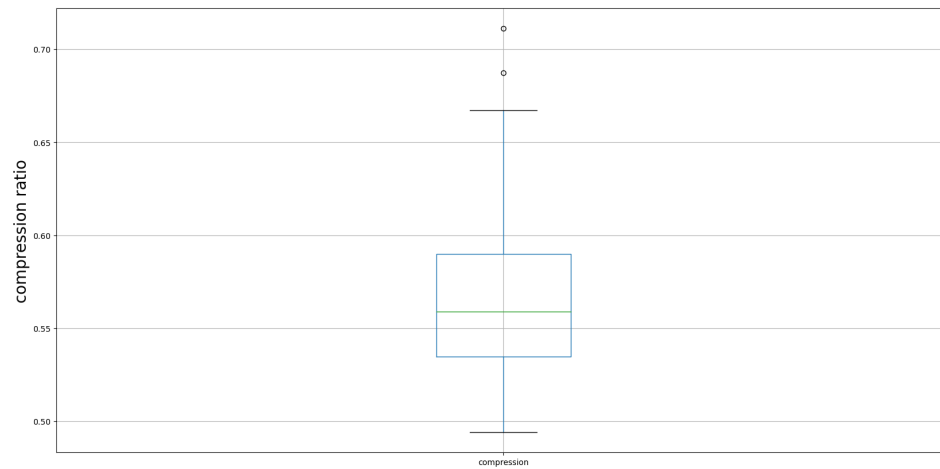
## 1.2 The MSE between the original .txt and the decoded .huf file:

	file_1	file_2	file_3	file_4	file_5	file_6	file_7	file_8	file_9	file_10
50	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
100	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
500	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1000	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5000	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

## 1.3 The encoding and decoding time for each N:



## 2 The variation of compression factors over all images using a notch-box plot:



### 2.1 The MSE between the original .bmp and the decoded .huf file:

MSE	
0	0.0
1	0.0
2	0.0
3	0.0
4	0.0
...	...
395	0.0
396	0.0
397	0.0
398	0.0
399	0.0

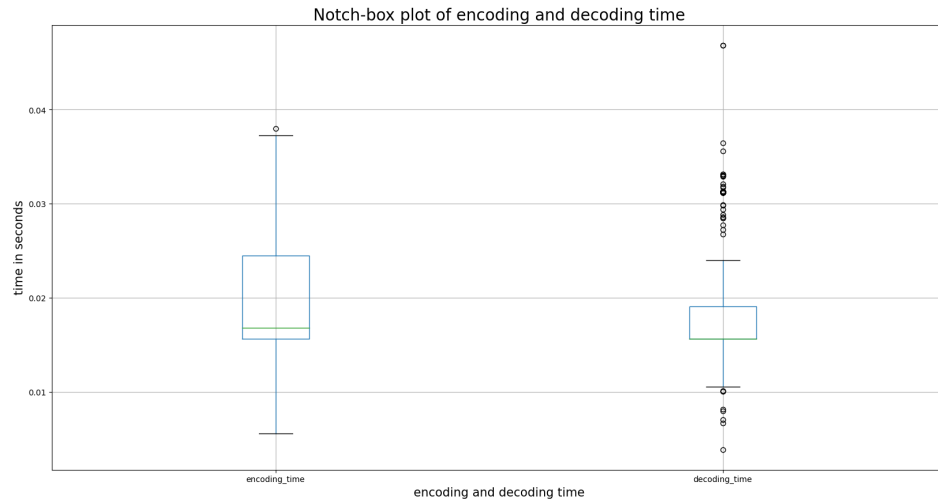
400 rows × 1 columns

## 2.2 The time to encode and decode each file:

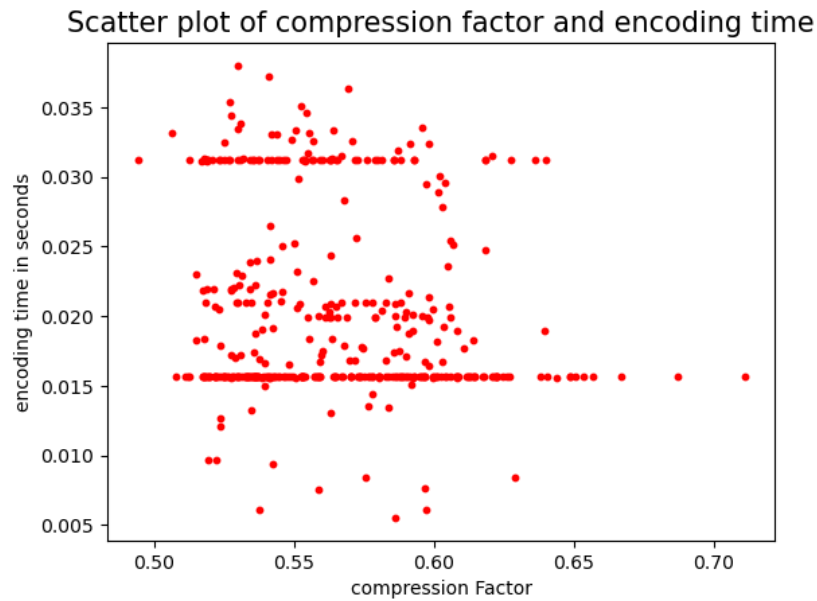
	encoding_time	decoding_time
0	0.028368	0.020901
1	0.014451	0.022237
2	0.025191	0.018782
3	0.020637	0.017940
4	0.020727	0.010046
...	...	...
395	0.031242	0.015622
396	0.015622	0.031244
397	0.029886	0.015623
398	0.007565	0.031246
399	0.033396	0.015622

400 rows × 2 columns

## 2.3 The Notch-box plot of encoding and decoding time:



## 2.4 The Scatter plot of compression factor and encoding time:



## 2.5 The Scatter plot of compression factor and decoding time:

