Taller Entropía de fuentes

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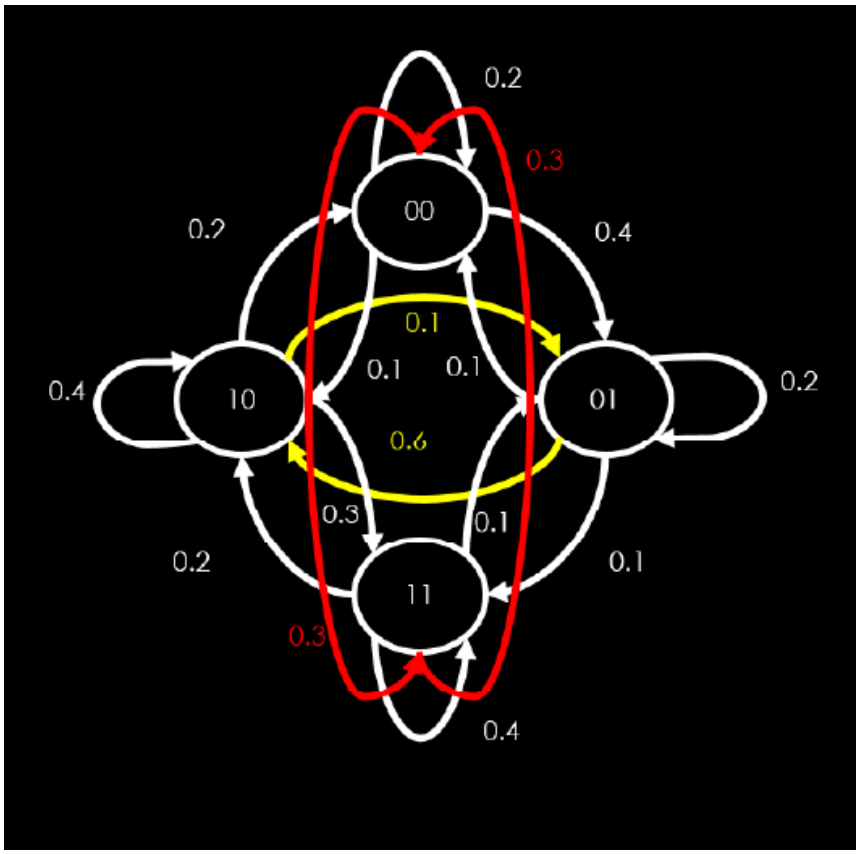
Encontrar la entropía de las siguientes fuentes

Orden:1 **Extension:**2



Fuente 1.

	00	01	11	10
00	0.2	0.4	0.3	0.1
01	0.1	0.2	0.1	0.6
11	0.3	0.1	0.4	0.2
10	0.2	0.1	0.3	0.4

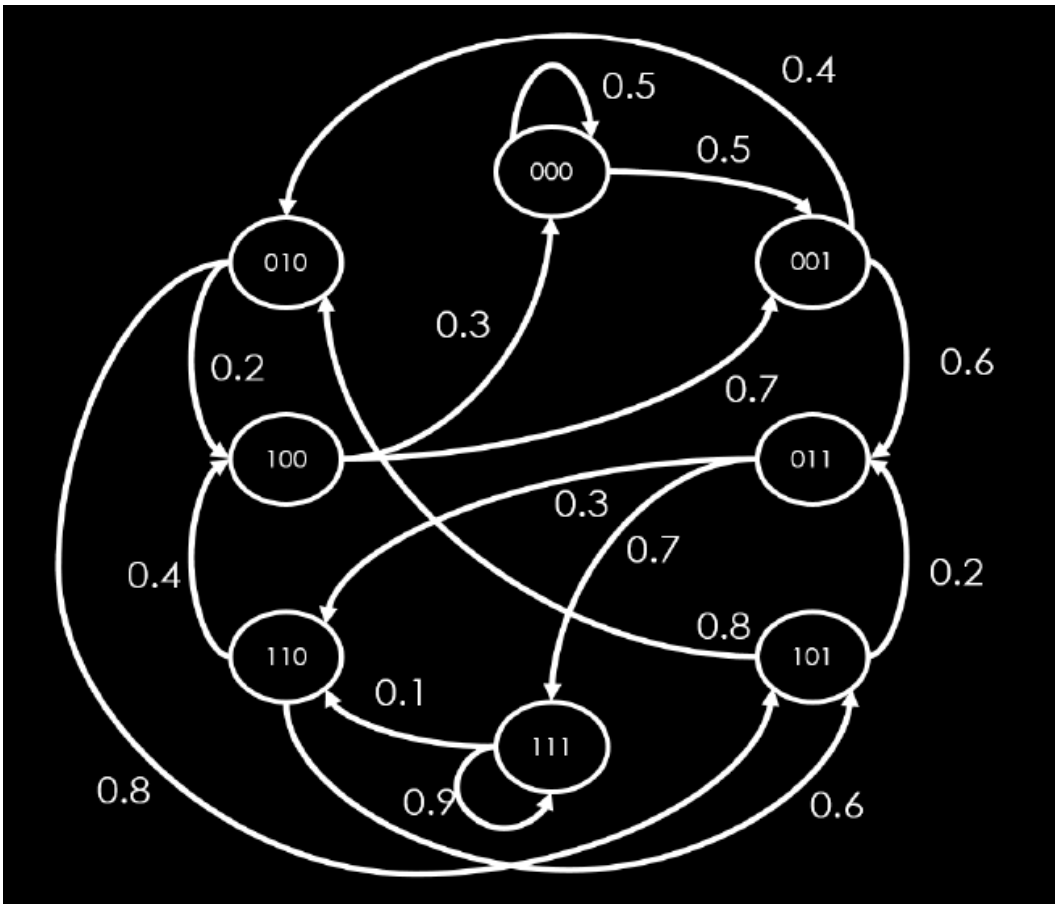
	00	01	11	10
00	0.21115	0.18149	0.29300	0.31435
01	0.21115	0.18149	0.29300	0.31435
11	0.21115	0.18149	0.29300	0.31435
10	0.21115	0.18149	0.29300	0.31435

S_j	S_i	$P(S_i/S_j)$	$P(S_j)$	$P(S_i, S_j)$
00	00	0.2	0.21115	0.0422
00	01	0.4	0.21115	0.0844
00	11	0.3	0.21115	0.0633
00	10	0.1	0.21115	0.0211
01	00	0.1	0.18149	0.0181
01	01	0.2	0.18149	0.0362
01	11	0.1	0.18149	0.0181
01	10	0.6	0.18149	0.1088
11	00	0.3	0.29300	0.0879
11	01	0.1	0.29300	0.0293
11	11	0.4	0.29300	0.1172
11	10	0.2	0.29300	0.0586
10	00	0.2	0.31435	0.0628
10	01	0.1	0.31435	0.0314
10	11	0.3	0.31435	0.0943
10	10	0.4	0.31435	0.1257
			Total	0.9999

$$H(S) = (0.0422)\log_2\left(\frac{1}{0.2}\right) + (0.0844)\log_2\left(\frac{1}{0.4}\right) + (0.0633)\log_2\left(\frac{1}{0.3}\right) + (0.0211)\log_2\left(\frac{1}{0.1}\right) + 2 * (0.0181)\log_2\left(\frac{1}{0.1}\right) + (0.0362)\log_2\left(\frac{1}{0.2}\right) + (0.1088)\log_2\left(\frac{1}{0.6}\right) + (0.0879)\log_2\left(\frac{1}{0.3}\right) + (0.0293)\log_2\left(\frac{1}{0.1}\right) + (0.1172)\log_2\left(\frac{1}{0.4}\right) + (0.0586)\log_2\left(\frac{1}{0.2}\right) + (0.0628)\log_2\left(\frac{1}{0.2}\right) + (0.0314)\log_2\left(\frac{1}{0.1}\right) + (0.0943)\log_2\left(\frac{1}{0.3}\right) + (0.1257)\log_2\left(\frac{1}{0.4}\right)$$

$$H(S) = 1.79518$$

Orden:3 **Extension:1**



Fuente 2.

	000	**001**	**011**	**101**	**111**	**110**	**100**	**010**
000	0.5	0.5	0	0	0	0	0	0
001	0	0	0.6	0	0	0	0	0.4
011	0	0	0	0	0.7	0.3	0	0
101	0	0	0.2	0	0	0	0	0.8
111	0	0	0	0	0.9	0.1	0	0
110	0	0	0	0.6	0	0	0.4	0
100	0.3	0.7	0	0	0	0	0	0
010	0	0	0	0.8	0	0	0.2	0

	000	**001**	**011**	**101**	**111**	**110**	**100**	**010**
000	0.0322	0.0537	0.0627	0.1523	0.4390	0.0627	0.0537	0.1433
001	0.0322	0.0537	0.0627	0.1523	0.4390	0.0627	0.0537	0.1433
011	0.0322	0.0537	0.0627	0.1523	0.4390	0.0627	0.0537	0.1433
101	0.0322	0.0537	0.0627	0.1523	0.4390	0.0627	0.0537	0.1433

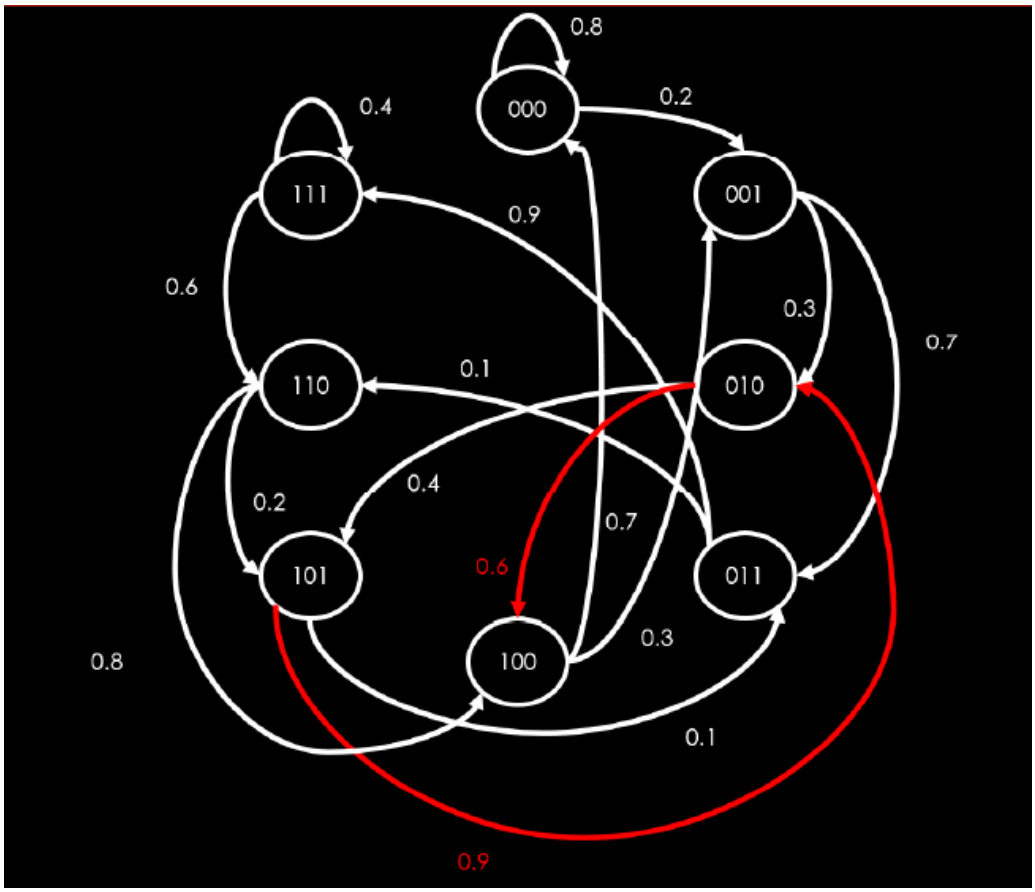
111	0.0322	0.0537	0.0627	0.1523	0.4390	0.0627	0.0537	0.1433
110	0.0322	0.0537	0.0627	0.1523	0.4390	0.0627	0.0537	0.1433
100	0.0322	0.0537	0.0627	0.1523	0.4390	0.0627	0.0537	0.1433
010	0.0322	0.0537	0.0627	0.1523	0.4390	0.0627	0.0537	0.1433

S_j	S_i	$P(S_i/S_j)$	$P(S_j)$	$P(S_i, S_j)$
000	000	0.5	0.0322	0.0161
000	001	0.5	0.0322	0.0161
001	011	0.6	0.0537	0.03222
001	010	0.4	0.0537	0.02148
011	111	0.7	0.0627	0.04389
011	110	0.3	0.0627	0.01881
101	011	0.2	0.1523	0.03046
101	010	0.8	0.1523	0.12184
111	111	0.9	0.4390	0.3951
111	110	0.1	0.4390	0.0439
110	101	0.6	0.0627	0.03762
110	100	0.4	0.0627	0.02508
100	000	0.7	0.0537	0.03759
100	001	0.3	0.0537	0.01611
010	101	0.8	0.1433	0.11464
101	100	0.2	0.1433	0.02866
			Total	0.9996

$$H(S) = 2 * (0.0161)\log_2\left(\frac{1}{0.5}\right) + (0.0322)\log_2\left(\frac{1}{0.6}\right) + (0.0214)\log_2\left(\frac{1}{0.4}\right) + (0.0438)\log_2\left(\frac{1}{0.7}\right) + (0.0188)\log_2\left(\frac{1}{0.3}\right) + (0.0304)\log_2\left(\frac{1}{0.2}\right) + (0.1218)\log_2\left(\frac{1}{0.8}\right) + (0.3951)\log_2\left(\frac{1}{0.9}\right) + (0.0439)\log_2\left(\frac{1}{0.1}\right) + (0.0376)\log_2\left(\frac{1}{0.6}\right) + (0.0250)\log_2\left(\frac{1}{0.4}\right) + (0.0376)\log_2\left(\frac{1}{0.7}\right) + (0.0161)\log_2\left(\frac{1}{0.3}\right) + (0.1146)\log_2\left(\frac{1}{0.8}\right) + (0.0286)\log_2\left(\frac{1}{0.2}\right)$$

$$H(S) = 0.666$$

Orden:3 **Extension:1**



Fuente 3.

	000	001	010	011	100	101	110	111
000	0.8	0.2	0	0	0	0	0	0
001	0	0	0.3	0.7	0	0	0	0
010	0	0	0	0	0.6	0.4	0	0
011	0	0	0	0	0	0	0.1	0.9
100	0.7	0.3	0	0	0	0	0	0
101	0	0	0.9	0.1	0	0	0	0
110	0	0	0	0	0.8	0.2	0	0
111	0	0	0	0	0	0	0.6	0.4

	000	001	010	011	100	101	110	111
000	0.38070	0.10877	0.07368	0.08070	0.10877	0.04561	0.08070	0.12105
001	0.38070	0.10877	0.07368	0.08070	0.10877	0.04561	0.08070	0.12105
010	0.38070	0.10877	0.07368	0.08070	0.10877	0.04561	0.08070	0.12105
011	0.38070	0.10877	0.07368	0.08070	0.10877	0.04561	0.08070	0.12105
100	0.38070	0.10877	0.07368	0.08070	0.10877	0.04561	0.08070	0.12105
101	0.38070	0.10877	0.07368	0.08070	0.10877	0.04561	0.08070	0.12105

110	0.38070	0.10877	0.07368	0.08070	0.10877	0.04561	0.08070	0.12105
111	0.38070	0.10877	0.07368	0.08070	0.10877	0.04561	0.08070	0.12105

S_j	S_i	$P(S_i/S_j)$	$P(S_j)$	$P(S_i, S_j)$
000	000	0.8	0.38070	0.30456
000	001	0.2	0.38070	0.07614
001	010	0.3	0.10877	0.032631
001	011	0.7	0.10877	0.076139
010	100	0.6	0.07368	0.044208
010	101	0.4	0.07368	0.029472
011	110	0.1	0.08070	0.00807
011	111	0.9	0.08070	0.07263
100	000	0.7	0.10877	0.076139
100	001	0.3	0.10877	0.032631
101	010	0.9	0.04561	0.041049
101	011	0.1	0.04561	0.004561
110	100	0.8	0.08070	0.06456
110	101	0.2	0.08070	0.01614
111	110	0.6	0.12105	0.07263
111	111	0.4	0.12105	0.04842
			Total	0.99998

$$H(S) = (0.3045)\log_2\left(\frac{1}{0.8}\right) + (0.0761)\log_2\left(\frac{1}{0.2}\right) + (0.0326)\log_2\left(\frac{1}{0.3}\right) + (0.0761)\log_2\left(\frac{1}{0.7}\right) + (0.0442)\log_2\left(\frac{1}{0.6}\right) + (0.0294)\log_2\left(\frac{1}{0.4}\right) + (0.0080)\log_2\left(\frac{1}{0.1}\right) + (0.0726)\log_2\left(\frac{1}{0.9}\right) + (0.0761)\log_2\left(\frac{1}{0.7}\right) + (0.0326)\log_2\left(\frac{1}{0.3}\right) + (0.0410)\log_2\left(\frac{1}{0.9}\right) + (0.0045)\log_2\left(\frac{1}{0.1}\right) + (0.0645)\log_2\left(\frac{1}{0.8}\right) + (0.0161)\log_2\left(\frac{1}{0.2}\right) + (0.0726)\log_2\left(\frac{1}{0.6}\right) + (0.0484)\log_2\left(\frac{1}{0.4}\right)$$

$$H(S) = 0.7721$$