Memory

Erasure Channel

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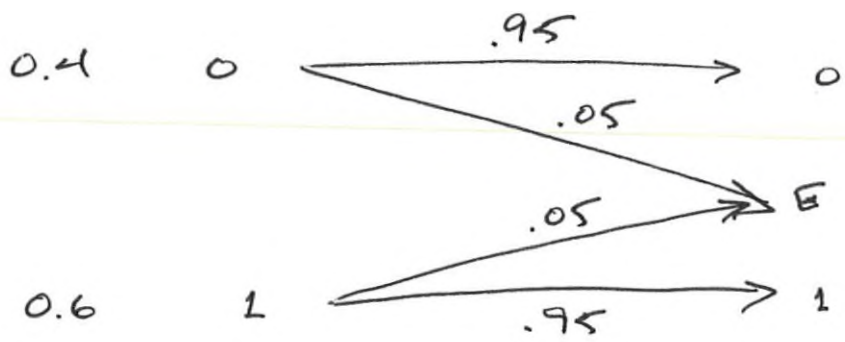

output

$P_B(0) = \vec{P}(0|0) P_A(0) = 0.95(0.4) = 0.38$

$P_B(E) = \vec{P}(E|0) P_A(0) + \vec{P}(E|1) P_A(1) = 0.05(0.4) + 0.05(0.$

$P_B(1) = \vec{P}(1|1) P_A(1) = 0.95(0.6) = 0.57$

backward transition probabilities are:

$\overleftarrow{P}(0|0) = \frac{\vec{P}(0|0) P_A(0)}{P_B(0)} = \frac{(.95)(.4)}{.38} = 1$

$\overleftarrow{P}(0|E) = \frac{\vec{P}(E|0) P_A(0)}{P_B(E)} = \frac{(.05)(.4)}{.05} = .4$

$\overleftarrow{P}(1|E) = \frac{\vec{P}(E|1) P_A(1)}{P_B(E)} = \frac{(.05)(.6)}{.05} = .6$

$\overleftarrow{P}(1|1) = \frac{\vec{P}(1|1) P_A(1)}{P_B(1)} = \frac{(.95)(.6)}{.57} = 1$

entropy of the source is

i<Àsiöe^.Oc>vv \s '.

$$H(A|B) = -P_B(b)\{\overleftarrow{P}(o|o)\log\overleftarrow{P}(o|o)\}$$

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»OA pnx w^S^eSSÌC»*^- **'$**

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Input Symbols: 0, 1

Input Symbol Probabilities

Xi:	P(Xi)
0:	0.4
1:	0.6

Output Symbols: 0, E, 1

Conditional Probabilities

Xi: P(0|Xi), P(E|Xi), P(l|Xi)
0: 0.95, 0.05, 0
1: 0, 0.05, 0.95

Channel Matrix

Xi\Yj	0	E	1
0	0.9500	0.0500	0.0000
1	0.0000	0.0500	0.9500

Joint and Marginal Distributions

Xi\Yj	0	E	1	P(Xi)
0	0.3800	0.0200	0.0000	0.4000
1	0.*0000*	0.0300	0.5700	0.6000
P(Yj)	0.3800	0.0500	0.5700	1.0000

Backward Channel Matrix

Yj\Xi	0	1
0	1.0000	0.0000
E	0.4000	0.6000
1	0.0000	1.0000

Entropies

H(X):	0.9710	bits/symbol
H(Y):	1.2088	bits/symbol
H(X|Y):	0.0485	bits/symbol
H(Y|X):	0.2864	bits/symbol
H(X,Y):	1.2573	bits/symbol

Mutual Information

I(X;Y): 0.9224 bits/symbol