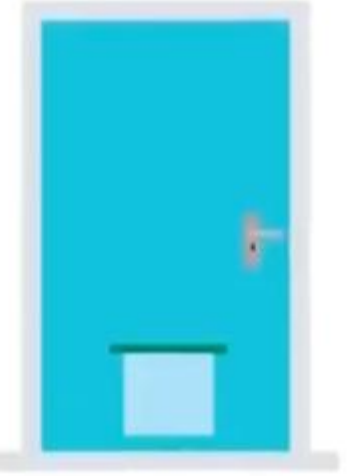
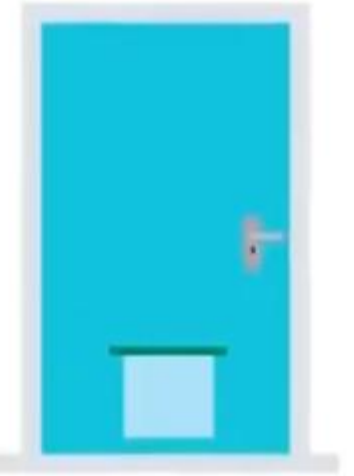
Cross Entropy Formula

Cross-Entropy

Cross-Entropy



Cross-Entropy



Cross-Entropy

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P(gift)	0.8	0.7	0.1
P(no gift)	0.2	0.3	0.9

Cross-Entropy

			
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Probability=
0.504

Cross-Entropy

0.8	0.7	0.1
0.8	0.7	0.9
0.8	0.3	0.1
0.2	0.7	0.1
0.8	0.3	0.9
0.2	0.7	0.9
0.2	0.3	0.1
0.2	0.3	0.9

Cross-Entropy

			Probability	
0.8	0.7	0.1	0.056	
0.8	0.7	0.9	0.504	
0.8	0.3	0.1	0.024	
0.2	0.7	0.1	0.014	
0.8	0.3	0.9	0.216	
0.2	0.7	0.9	0.126	
0.2	0.3	0.1	0.006	
0.2	0.3	0.9	0.054	

Cross-Entropy

			Probability	-ln(Probability)
 0.8	 0.7	 0.1	0.056	2.88
 0.8	 0.7	 0.9	0.504	0.69
 0.8	 0.3	 0.1	0.024	3.73
 0.2	 0.7	 0.1	0.014	4.27
 0.8	 0.3	 0.9	0.216	1.53
 0.2	 0.7	 0.9	0.126	2.07
 0.2	 0.3	 0.1	0.006	5.12
 0.2	 0.3	 0.9	0.054	2.92

Cross-Entropy

			Probability	-ln(Probability)
0.8	0.7	0.1	0.056	2.88
0.8	0.7	0.9	0.504	0.69
0.8	0.3	0.1	0.024	3.73
0.2	0.7	0.1	0.014	4.27
0.8	0.3	0.9	0.216	1.53
0.2	0.7	0.9	0.126	2.07
0.2	0.3	0.1	0.006	5.12
0.2	0.3	0.9	0.054	2.92

Cross-Entropy

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Cross-Entropy

Cross-Entropy

Cross-Entropy

$$-\ln(0.8) - \ln(0.7) - \ln(0.9)$$

Cross-Entropy

$p_1 = 0.8$

0.8 0.7 0.9

Cross-Entropy

-ln(0.8) - ln(0.7) - ln(0.9)

Cross-Entropy

$p_1 = 0.8$

$p_2 = 0.7$

Cross-Entropy

-ln(0.8) - ln(0.7) - ln(0.9)

Cross-Entropy

$p_1 = 0.8$

$p_2 = 0.7$

$p_3 = 0.1$

Cross-Entropy

$-\ln(0.8) - \ln(0.7) - \ln(0.9)$

Cross-Entropy

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Cross-Entropy

$-\ln(0.8) - \ln(0.7) - \ln(0.9)$

Cross-Entropy

$p_1 = 0.8$

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Cross-Entropy

$-\ln(0.8) - \ln(0.7) - \ln(0.9)$

$y_i = 1$ if present on box i

Cross-Entropy

$p_1 = 0.8$

$p_2 = 0.7$

$p_3 = 0.1$

$y_i = 1$ if present on box i

$y_1 = 1$ $y_2 = 1$

Cross-Entropy

$-\ln(0.8) - \ln(0.7) - \ln(0.9)$

Cross-Entropy

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$y_i = 1$ if present on box i

Cross-Entropy

-ln(0.8) - ln(0.7) - ln(0.9)

Cross-Entropy

$p_1 = 0.8$

$p_2 = 0.7$

$p_3 = 0.1$

p_1 p_2 $1 - p_3$

$y_i = 1$ if present on box i

$y_1 = 1$ $y_2 = 1$ $y_3 = 0$

Cross-Entropy

$-\ln(0.8) - \ln(0.7) - \ln(0.9)$

$$\text{Cross-Entropy} = -\sum_{i=1}^{m} y_i \ln(p_i) + (1 - y_i)\ln(1 - p_i)$$

Cross-Entropy

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p_1 p_2 $1 - p_3$

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Cross-Entropy

$-\ln(0.8) - \ln(0.7) - \ln(0.9)$

$$\text{Cross-Entropy} = -\sum_{i=1}^{m} y_i \ln(p_i) + (1 - y_i)\ln(1 - p_i)$$

$$CE[(1,1,0), (0.8,0.7,0.1)] = 0.69$$

Cross-Entropy

$p_1 = 0.8$

$p_2 = 0.7$

$p_3 = 0.1$

p_1 p_2 $1 - p_3$

$y_i = 1$ if present on box i

$y_1 = 1$ $y_2 = 1$ $y_3 = 0$

Cross-Entropy

-ln(0.8) - ln(0.7) - ln(0.9)

$$\text{Cross-Entropy} = -\sum_{i=1}^{m} y_i \ln(p_i) + (1 - y_i)\ln(1 - p_i)$$

CE[(1,1,0), (0.8,0.7,0.1)] = 0.69

CE[(0,0,1), (0.8,0.7,0.1)] = 5.12