3.) Given a 2-class classification problem:

Assume $\log = \ln$ — $= -\infty$, so assume just a bit bigger than 0

$\hat{p}_{m1}$	Gini Index $= G_m = \sum_{k=1}^{K} \hat{p}_{mk}(1-\hat{p}_{mk})$	Classification Error $= E_m = 1 - \max_k(\hat{p}_{mk})$	Entropy $= D_m = -\sum_{k=1}^{K} \hat{p}_{mk} \cdot \log(\hat{p}_{mk})$
0	$(0)(1-0)+(1)(1-1) = 0$	$E = 1-\max(0,1) = 0$	$-(0)\cdot\log(0)-(1)(0) = 0$
0.1	$(0.1)(1-.1)+(0.9)(1-.9) = 0.18$	$E = 1-\max(0.1,0.9) = 0.1$	$-(.1)\log(.1)-.9\log(.9) = 0.325$
0.2	$(0.2)(1-.2)+(0.8)(1-.8) = 0.32$	$E = 1-\max(0.2,0.8) = 0.2$	$-[.2\log(.2)+.8\log(.8)] = 0.50$
0.3	$(0.3)(1-.3)+(.7)(1-.7) = 0.42$	$E = 1-\max(0.3,0.7) = 0.3$	$-.3\log(.3)-.7\log(.7) = 0.61$
0.4	$(0.4)(1-.4)+(.6)(1-.6) = 0.48$	$E = 1-\max(0.4,0.6) = 0.4$	$-.4\log(.4)-.6\log(.6) = 0.673$
0.5	$(0.5)(1-.5)+(.5)(1-.5) = 0.50$	$E = 1-\max(0.5,0.5) = 0.5$	$-.5\log(.5)-.5\log(.5) = 0.693$
0.6	$(0.6)(1-.6)+(.4)(1-.4) = 0.48$	$E = 1-\max(0.6,0.4) = 0.4$	$-.6\log(.6)-.4\log(.4) = 0.673$
0.7	$(0.7)(1-.7)+(.3)(1-.3) = 0.42$	$E = 1-\max(0.7,0.3) = 0.3$	$-.7\log(.7)-.3\log(.3) = 0.61$
0.8	$(0.8)(1-.8)+(.2)(1-.2) = 0.32$	$E = 1-\max(0.8,0.2) = 0.2$	$-.8\log(.8)-.2\log(.2) = 0.50$
0.9	$(0.9)(1-.9)+(.1)(1-.1) = 0.18$	$E = 1-\max(0.9,0.1) = 0.1$	$-.9\log(.9)-.1\log(.1) = 0.325$
1.0	$(1.0)(1-1)+(0)(1-0) = 0$	$E = 1-\max(1,0) = 0$	$-1\log(1)-0\log(0) = 0$