Homework 1
(Due Thursday, April 03, 2008 at 5:00pm)

Problem 1: With three games remaining in the baseball season, the Midgets and the Cowards are tied for the first place. Depending on the outcomes of the final three games, which are played against other teams, either Midgets or Cowards will win the championship or they will tie.

(a) Assume that each of the remaining games played by the contending teams are won or lost with probability 0.5. Compute the entropy of the random variable whose outcomes are {win, lose, tie} for Midgets.
(b) Assume that the Cowards win all three games against their feeble opponents. Compute the conditional entropy of the random variable whose outcomes are {win, lose, tie} for the Midgets.

Problem 2: Problem 2.3 in text

Problem 3: Problem 2.10 in text

Problem 4: Problem 2.16 in text

Problem 5: Problem 2.18 in text

Problem 6: Problem 2.19 in text plus add the following part:
(c) Let $X_1$ and $X_2$ be uniformly distributed over their alphabets. What is the maximizing $\alpha$ and the corresponding entropy $H(X)$?

Problem 7: Problem 2.23 in text

Problem 8: Problem 2.27 in text

Problem 9: Problem 2.29 in text