

# ECE 341 - Homework #1

Tree Diagrams and Enumeration. Due Wednesday, May 19th

Please make the subject "ECE 341 HW#1" if submitting homework electronically to Jacob\_Glower@yahoo.com (or on blackboard)

1) Two teams, A and B, are playing a best of 5 game series.

- The series is over once one team gets 3 points.
- The probability of A winning any given game is 0.7.
- B starts out with 2 points (odds)

Draw the tree diagram for all possible outcomes of the series.

2) List all possible combinations of rolling a 4-sided die (d4) and a 6-sided die (d6) (enumeration).

Also determine the probability  $X \in \{1..6\}$  where  $X$  is the difference between the two numbers (largest - smallest).

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Two players, A and B, are playing a game of dice.

- Player A rolls a d4 and a d6 and takes the difference between the two numbers (i.e. problem #2)
- Player B rolls a 6-sided die and subtracts one ( $d6 - 1$ ).

Player A wins on ties.

3) What is the conditional probability

- Player A wins given B's score is 3 (B rolled a 4)

4) What is the probability that player A will win any given game?

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## Monte Carlo Simulations & Enumeration with Farkle:

5) Determine the probability of rolling 6 dice and getting 4 of a kind (xxxx yz, xyz are different numbers) using a Monte Carlo simulation with 1 million rolls of the dice. (note: xxxx yy counts as 3 pair not 4 of a kind)

6) Determine the probability of rolling 6 dice and getting 4 of a kind using enumeration (exhaustive search).

## Monte Carlo Simulations & Enumeration with 4-Card Poker

7) Determine the probability of being dealt 3 of a kind in 4-card poker (you're dealt only 4 cards)

- 52-card deck, deal 4 cards.
- The five cards are xxx y where x, y are different values (ace to king)

8) Determine the probability of being dealt a 3 of a kind in 4-card poker using enumeration (exhaustive search).