

Class test

short questions

1. A bag contains one red ball, 1000 blue balls and 1000 yellow balls; two balls are taken from the bag. What is the sample space?
2. What is an event?
3. Ireland is divided into four provinces: Munster, Leinster, Ulster and Connaught. Two provinces are selected at random; what is the event that both end in 'ster' and what is the probability of this event?
4. A sample space consists of the words {stately, plump, buck, mulligan, came, from, the, stairhead}. The event A consists of all words with four or fewer letters. The event B consists of all words ending in a vowel. What is $p(B)$ and $p(B|A)$?
5. What is the 'naïve' aspect of the naïve Bayes estimator?
6. If X is a random variable define the expected value of X ?
7. A shopkeeper says she has two new baby beagles to show you, but she doesn't know whether they're male, female, or one of each. You tell her that you want only a male, and she telephones the fellow who's giving them a bath. "Is at least one a male?" she asks him. "Yes!" she informs you with a smile. What is the probability that the other one is a male? (This question is taken from Marilyn von Savant's Ask Marilyn column).
8. A six sided dice is rolled ten times, what is the probability of getting exact three sixes?

long question

This question is about calculating probabilities in the context of the card game baccarat. In the game of baccarat the player and dealer are dealt cards; two initial and possibly a third. Each hand is given a score and, ultimately the hand with the highest score wins. The Ten, Jack, Queen and King are worth zero points, the Ace is worth one point and all the other cards have a value which corresponds to their face value; a seven is worth seven points for example. The value of a hand is worth the sum of the points in it, modulo ten; or put another way, it is equal to the last digit, so if a player has a King and a nine, the hand is worth nine points; if they have two nines, the hand is worth eight points since $9 + 9 = 18$ and eight is the final digit of 18.

1. If a player is dealt two cards from a 52 card deck what is the chance of getting zero?
2. If the player is dealt two cards from a 52 card deck what is the chance of a getting eight or nine points?
3. If the player is dealt an eight or nine, what is the probability they have in fact a nine?