

Chapter 14

Probability Rules!

The three rules of answering a probability...

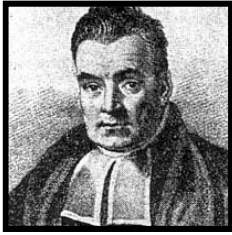
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The Addition Rule needs to be “corrected” if the events are not disjoint (meaning they DO have something in common) – you need to subtract out the “overlap.”

The Multiplication Rule needs to be “corrected” if the events are not independent (meaning one DOES influence the other) – these are what was mentioned as conditional probabilities last chapter. You’ll see these as “given that”s.

1. One card is drawn. What is the probability that it is an ace or red?
2. Two cards are drawn without replacement. What is the probability that they are both aces?
3. $P(\text{five hearts in a row})$.
4. I draw one red card and look at it and tell you it’s red. What is the probability that it’s a heart?
5. What is the probability it’s a red card given that it’s a heart?

Baye's Rule



6. Are red card and spades independent?
7. Are red cards and spades mutually exclusive?
8. Are red cards and aces independent?
9. Are red cards and aces disjoint?
10. Are face cards and kinds independent?
11. Are face cards and kings mutually exclusive?
12. After surveying 995 adults, 81.5% of whom were over 30, the National Sleep Foundation reported that 36.8% of all the adults snored. 32% of the respondents were snorers over the age of 30. Are snoring and age mutually exclusive? Is snoring independent of age? Provide statistical evidence.

13. In one town in the Pacific Northwest, only 21% of days are sunny. A company's records indicate that on sunny days 2.3% of employees will call in sick. When it is not sunny, 1.1% of employees will call in sick. What percent of calls (where an employee calls in sick) occur on sunny days?

14. At Sally's Hair Salon there are three stylists. 21% of the hair cuts are done by Chris, 31% are done by Karine, and 48% are done by Amy. Chris finds that when he does hair cuts, 7% of the customers are not satisfied. Karine find that when she does hair cuts, 8% are not satisfied. And for Amy, it's 5%. What percentage of unhappy customers had their hair cut by Amy?