Section 2.2: cont'd

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8:33 AM

example: At the Red Barn market, you can get an ice-cream cone with two scoops of ice-cream chosen from the following flavors: chocolate, raspberry, bubblegum, and vanilla. Let's say that customers always choose two different flavors for their scoops and the cone with vanilla on top is the same as the cone with vanilla on the bottom (order of scoops doesn't matter.) Let's further say that when averaged over all customers, each flavor is equally likely to be chosen.

a) How many different ice-cream cones are there? If a random customer makes an order, what probability does a particular cone have to be picked?

brute force: 4 flavors C R B V

CR RB BV
CB RV
CV

note: can also use combination (later this chapter)

6 different cones possible, each with probability 1/6

b) What's the probability that a random customer will order chocolate as one of the scoops?

$$P(C) = \frac{n(C)}{n_{tot}} = \frac{3}{6} = \boxed{\frac{1}{2} \text{ or } 50\%}$$

c) What's the probability that a customer will

order chocolate or vanilla?

$$P(C \text{ or } V) = \frac{n(C \text{ or } V)}{n} = \frac{5}{6}$$

d) Calculate (c) again using a different method.

$$P(C \text{ or } V) = 1 - P(\overline{C \text{ or } V})$$

$$= 1 - P(RB)$$

$$= 1 - 1/6 = 5/6$$

e) Calculate (c) again using yet another method!

$$P(C \text{ or } V) = P(C) + P(V) - P(CV)$$

$$= 1/2 + 1/2 - 1/6$$

$$= 5/6$$