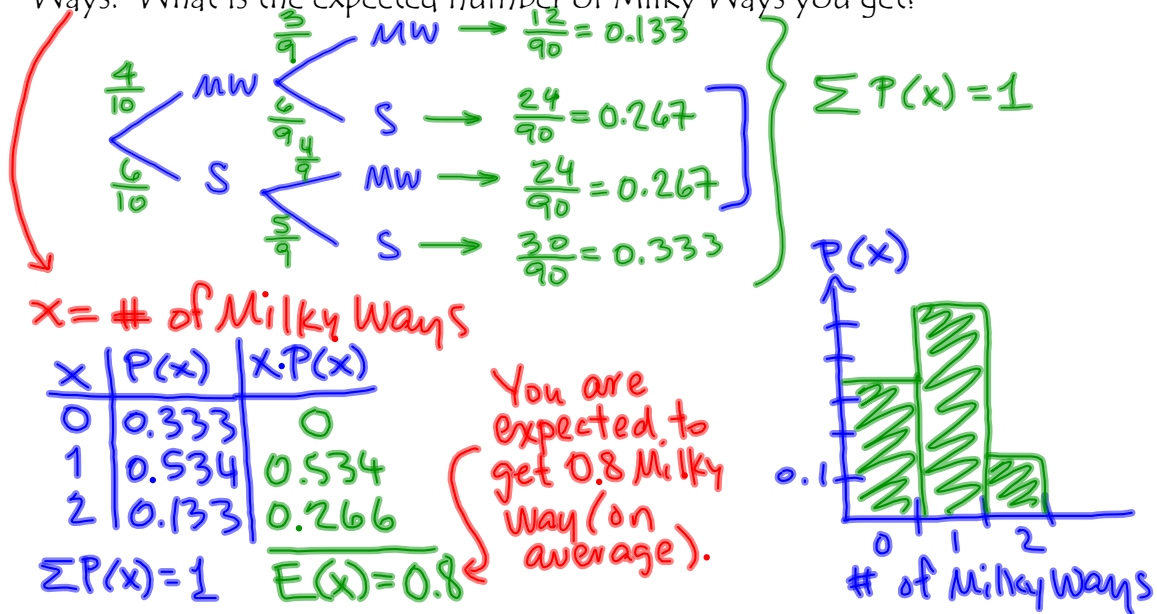# Constructing Probability Model Notes

Example 1:

A bowl of mini candy bars has 4 Milky Ways and 6 Snickers. You choose two candy bars at random. Create a Probability Model for the number of Milky Ways. What is the expected number of Milky Ways you get?

$\frac{4}{10}$ MW $\begin{cases} \frac{3}{9} \text{ MW} \to \frac{12}{90} = 0.133 \\ \frac{6}{9} \text{ S} \to \frac{24}{90} = 0.267 \end{cases}$

$\frac{6}{10}$ S $\begin{cases} \frac{4}{9} \text{ MW} \to \frac{24}{90} = 0.267 \\ \frac{5}{9} \text{ S} \to \frac{30}{90} = 0.333 \end{cases}$

$\sum P(x) = 1$

x = # of Milky Ways

X	P(x)	X·P(x)
0	0.333	0
1	0.534	0.534
2	0.133	0.266

$\sum P(x) = 1$ $E(x) = 0.8$

You are expected to get 0.8 Milky Way (on average).

P(x) ... # of Milky Ways

Example 2:

A woman buys a minor league baseball team for $35,000 and is hoping to sell the team after two seasons and turn a profit. She has done a lot of research and found that if the team has two winning seasons then she can sell the team for $105,000. If the team has one winning season and one losing season then she can sell the team for $65,000. If the team has two losing seasons then she can sell the team for $20,000. She thinks the team will have a 30% chance of winning the first season and a 40% chance of winning the second season. Assuming the two seasons are independent events, create a probability model and calculate her expected profit.

x = profit

0.3 W $\begin{cases} 0.4 \text{ W} \to 0.12 \\ 0.6 \text{ L} \to 0.18 \end{cases}$

0.7 L $\begin{cases} 0.4 \text{ W} \to 0.28 \\ 0.6 \text{ L} \to 0.42 \end{cases}$

$\sum P(x) = 1$

X	P(x)	X·P(x)
0 → -15000	0.42	-6300
1 → 30000	0.46	13800
2 → 70000	0.12	8400

$E(x) = 15,900$

Her expected profit is an average of $15,900.

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