Ex. Appr. 10% of the glass bottles coming off a production line have serious flaws in the glass.

If 2 bottles are randomly selected, find the mean of the # of bottles that have serious flaws.

Sol'n: $X = \#$ of bottles with flaws

$$\left(\begin{array}{c|c|c|c} X & 0 & 1 & 2 \\ \hline p(X) & 0.81 & 0.18 & 0.01 \end{array} \right) \rightarrow \text{dist'n of } X$$

$$E[X] = 0 \cdot 0.81 + 1 \cdot 0.18 + 2 \cdot 0.01$$
$$= 0.2$$

Ex. A heavy-equipment salesperson can contact 1 or 2 customers per day with probability $1/3$ and $2/3$, resp. Each contact will result in either no sale or a $50,000 sale, with the probabilities 0.9 and 0.1, resp. Find the mean of the daily sales.

Sol'n: $X =$ daily sales

$$P(X=0) = \frac{1}{3} \cdot 0.9 + \frac{2}{3} \cdot 0.9 \cdot 0.9$$

$$= \frac{1}{3} \cdot \frac{9}{10} \cdot \frac{2}{3} \cdot \frac{81}{100} = \frac{252}{300}$$

$$P(X=2) = \frac{2}{3} \cdot 0.1 \cdot 0.1 = \frac{2}{300}$$

$$P(X=1) = 1 - \frac{252}{300} - \frac{2}{300} = \frac{46}{300}$$

$$E(X) = 0 \cdot \frac{252}{300} + 50000 \cdot \frac{46}{300}$$

$$+ 100000 \cdot \frac{2}{300} = \$ 8333.33$$