

Two Dice Experiment

The probability model for the experiment of tossing two fair dice is given by the table below, and extended to calculate the mean and variance of this model.

i	x_i	P_i	$x_i \cdot P_i$	$x_i - \mu$	$(x_i - \mu)^2$	$(x_i - \mu)^2 \cdot P_i$
1	2	$\frac{1}{36}$	$\frac{2}{36}$	-5	25	$\frac{25}{36}$
2	3	$\frac{2}{36}$	$\frac{6}{36}$	-4	16	$\frac{32}{36}$
3	4	$\frac{3}{36}$	$\frac{12}{36}$	-3	9	$\frac{27}{36}$
4	5	$\frac{4}{36}$	$\frac{20}{36}$	-2	4	$\frac{16}{36}$
5	6	$\frac{5}{36}$	$\frac{30}{36}$	-1	1	$\frac{5}{36}$
6	7	$\frac{6}{36}$	$\frac{42}{36}$	0	0	0
7	8	$\frac{5}{36}$	$\frac{40}{36}$	+1	1	$\frac{5}{36}$
8	9	$\frac{4}{36}$	$\frac{36}{36}$	+2	4	$\frac{16}{36}$
9	10	$\frac{3}{36}$	$\frac{30}{36}$	+3	9	$\frac{27}{36}$
10	11	$\frac{2}{36}$	$\frac{22}{36}$	+4	16	$\frac{32}{36}$
11	12	$\frac{1}{36}$	$\frac{12}{36}$	+5	25	$\frac{25}{36}$
Sums		$\frac{36}{36}$	$\frac{252}{36}$			$\frac{210}{36}$

Thus

$$\begin{aligned} \mu &= \frac{252}{36} = 7 \\ \text{VAR} &= \frac{210}{36} \approx 5.83333 \\ \text{and } \sigma &= \sqrt{\frac{210}{36}} \approx 2.4152 \end{aligned}$$