

MAS 170 Elementary Statistics Spring 2020
Sum of Draws Practice Problems, Ch 16 to 18
Solutions Key

1. The box model has six tickets: (1) 4 and (5) -1's.

$$\begin{aligned}\text{AVE}(\text{box}) &= -1/6 \\ \text{SD}(\text{box}) &= 5\sqrt{1/6 * 5/6} = \text{approx } 1.86\end{aligned}$$

$$\begin{aligned}\text{E}(\text{sum}) &= -100 \\ \text{SE}(\text{sum}) &= \text{approx } 45.64\end{aligned}$$

2. $z = \text{approx } (0 - (-100))/45.64 = \text{approx } 2.19$
 $P = \text{approx } 1.5\%$

3. The box model has (1) 1 and (5) 0's.

$$\begin{aligned}\text{AVE}(\text{box}) &= 1/6 \\ \text{SD}(\text{box}) &= \sqrt{1/6 * 5/6} = \text{approx } .373\end{aligned}$$

$$\begin{aligned}\text{E}(\text{sum}) &= 100 \\ \text{SE}(\text{sum}) &= \text{approx } 9.13\end{aligned}$$

4. $z = \text{approx } (110 - 100)/9.13 = \text{approx } 1.1$
 $P = \text{approx } 14\%$

5. The box model has the tickets 1,2,3,4,5,6.

$$\begin{aligned}\text{AVE}(\text{box}) &= 3.5 \\ \text{SD}(\text{box}) &= \text{approx } 1.71 \text{ (no shortcut!!)}\end{aligned}$$

$$\begin{aligned}\text{E}(\text{sum}) &= 2100 \\ \text{SE}(\text{sum}) &= \text{approx } 41.83\end{aligned}$$

6. $z = \text{approx } (2150 - 2100)/41.83 = \text{approx } 1.2$
 $P = \text{approx } 77\%$

7. z for 50% is about .67
range is 2100 +/- 28

8. One possible box model has (3) 1's and (3) 0's. A simpler box model has (1) 1 and (1) 0 with equal probabilities of 1/2 each.

$$\begin{aligned}\text{AVE}(\text{box}) &= 1/2 \\ \text{SD}(\text{box}) &= 1/2\end{aligned}$$

$$\begin{aligned}\text{E}(\text{sum}) &= 300 \\ \text{SE}(\text{sum}) &= \text{approx } 12.25\end{aligned}$$

9. $z = \text{approx } (320 - 300)/12.25 = \text{approx } 1.63$
 $P = \text{approx } 10\%$