

Only complete and organized solutions will receive full marks.

1. The number of points scored by two players is shown.

Keenan	35	13	34	45	29	14	42	19
Chris	29	45	27	35	13	32	24	26

- a) Calculate  $\bar{X}$  and the median for each player. [4]  
 b) Calculate the standard deviation for each player. [6]  
 c) Based on your calculations which player would you use in a crucial situation, in which you must score points? Justify your answer. [2]  
 d) How many of each player's scores fell within one standard deviation of the mean? [2]

**Solution:**

a) Keenan:  $\bar{X} \square 28.9$

$$\begin{aligned} \text{Median} &= \frac{t_4 + t_5}{2} \\ &= \frac{29 + 34}{2} \\ &= 31.5 \end{aligned}$$

Chris:  $\bar{X} \square 28.9$

$$\begin{aligned} \text{Median} &= \frac{t_4 + t_5}{2} \\ &= \frac{27 + 29}{2} \\ &= 28 \end{aligned}$$

- b) Keenan:

$$\begin{aligned} \sigma &= \sqrt{\frac{(35-28.9)^2 + (13-28.9)^2 + (34-28.9)^2 + (45-28.9)^2 + (29-28.9)^2 + (14-28.9)^2 + (42-28.9)^2 + (19-28.9)^2}{8}} \\ &= \sqrt{\frac{(6.1)^2 + (-15.9)^2 + (5.1)^2 + (16.1)^2 + (0.1)^2 + (-14.9)^2 + (13.1)^2 + (-9.9)^2}{8}} \\ &= \sqrt{\frac{1066.88}{8}} \\ &= \sqrt{133.36} \\ &\approx 11.55 \end{aligned}$$

Chris:

$$\begin{aligned} \sigma &= \sqrt{\frac{(29-28.9)^2 + (45-28.9)^2 + (27-28.9)^2 + (35-28.9)^2 + (13-28.9)^2 + (32-28.9)^2 + (24-28.9)^2 + (26-28.9)^2}{8}} \\ &= \sqrt{\frac{(0.1)^2 + (16.1)^2 + (-1.9)^2 + (6.1)^2 + (-15.9)^2 + (3.1)^2 + (-4.9)^2 + (-2.9)^2}{8}} \\ &= \sqrt{\frac{594.88}{8}} \\ &= \sqrt{74.36} \\ &\approx 8.6 \end{aligned}$$

- c) Since both Keenan and Chris have the same mean but different standard deviations, and since Chris has a smaller standard deviation, hence, less spread in scores, then I would use Chris in a crucial situation to score points.  
 d) Keenan :

$$\bar{X} - \sigma \square 28.9 - 11.5 = 17.4$$

$$\bar{X} + \sigma \square 28.9 + 11.5 = 40.4$$

4 scores fall within one standard deviation of the mean (scores that fall between 16.5 and 41.2).

Chris:  $\bar{X} - \sigma \square 28.9 - 8.6 = 20.3$

$$\bar{X} + \sigma \square 28.9 + 8.6 = 37.5$$

6 scores fall within one standard deviation of the mean (score that fall between 19.7 and 38.2)