Suppose that Aurelio’s bowling score (in a randomly selected game) follows a normal distribution with mean 140 and SD 20. Suppose that he bowls two games, with the same probability distribution of scores for the two games. (Call these random variables $X$ and $Y$, and let $C = X + Y$ represent his combined score in the two games.) Assume for questions #1–2 that his two scores ($X$ and $Y$) are independent.

1. Determine the mean and SD of his combined score in the two games.

2. Determine the probability that his combined score exceeds 300.

Now suppose for questions #3–4 that the correlation coefficient between his two scores is 0.6.

3. Will this change affect the mean or SD, or both, or neither, of his combined score?

4. Determine the probability that his combined score exceeds 300.

5. How does the probability in #4 (with a positive correlation) compare to that in #2 (assuming independence)? Explain why this makes sense intuitively.