

Let $\mathbf{s} = \{s_1, s_2, \dots, s_N\}$, $\alpha = \{s_1 + s_2 + \dots + s_N\}$ and $\beta = \{s_1^2 + s_2^2 + \dots + s_N^2\}$ where $\mathbf{s} \in R^N$. Then the mean of \mathbf{s} $\mu = \frac{1}{N} \sum_{i=1}^N x_i$ and standard deviation $\sigma = \sqrt{\frac{1}{N-1} \sum_{i=1}^N (x_i - \mu)^2}$ could be re-written in terms of α and β as $\mu = \alpha/N$ and $\sigma = \sqrt{\frac{\beta - N\mu^2}{N-1}}$ respectively.

If you want the demonstration then we have to meet in McDonads !