

MNStatC Probability July Problem

Cheenta Statistics and Analytics Department

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“ Statistics must have a clearly defined purpose, one aspect of which is scientific advance and the other, human welfare and national development. ”

P.C.Mahalanobis

1 Symmetric Random Walk

Consider a symmetric random walk with $S_0 = 0$. Let $T = \min \{n \geq 1 : S_n = 0\}$ be the first time of the first return of the walk to its starting point. Write down the pmf of the random variable T and deduce that $E(T^\alpha) < \infty$ iff $\alpha < \frac{1}{2}$.