

Answer on Question #66861 - Math – Statistics and Probability

An athlete is running in four races and in each race she has 60% chance of winning. What is the probability that she will win at least two races?

Solution. Let ξ be the number of races the athlete wins. Then ξ is a binomially distributed random variable with parameters $n=4$ and $p=0.6$ (e.g., [1, p. 14]). We need to find $P(\xi \geq 2)$. We have

$$\begin{aligned} P(\xi \geq 2) &= P(\xi = 2) + P(\xi = 3) + P(\xi = 4) = \\ &C(4,2) \cdot 0.6^2 \cdot 0.4^2 + C(4,3) \cdot 0.6^3 \cdot 0.4 + C(4,4) \cdot 0.6^4 = \\ &6 \cdot 0.36 \cdot 0.16 + 4 \cdot 0.216 \cdot 0.4 + 0.1296 = 0.8208. \end{aligned}$$

Answer. 0.8208.

References

1. Shiryaev A.N. Probability-1. Third edition. Springer. 2016.

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