Exercise: Binomial probabilities

(2/2 points)

Recall that the probability of obtaining k Heads in n independent coin tosses is $\binom{n}{k}p^k(1-p)^{n-k}$, where p is the probability of Heads for any given coin toss.

Find the value of $\sum_{k=0}^{n}\binom{n}{k}p^k(1-p)^{n-k}$. (Your answer should be a number.)

1 ✔ **Answer:** 1

Answer:
Note that the events “0 Heads", “1 Heads", ..., “n Heads" are disjoint, and their union is the entire sample space. The summation is adding up the probability of all of these events. Hence, the sum must be 1. In other words, each term in the summation gives the probability of obtaining k Heads out of n tosses. We then sum over all values of k, from 0 to n. Since the number of Heads must be one of $0, 1, \ldots, n$ these probabilities must sum up to 1.

You have used 1 of 2 submissions


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