Exercise: Variance of the uniform

(2/2 points)

Suppose that the random variable X takes values in the set $\{0, 2, 4, 6, \ldots, 2n\}$ (the even integers between 0 and $2n$, inclusive), with each value having the same probability. What is the variance of X? *Hint:* Consider the random variable $Y = X/2$ and recall that the variance of a uniform random variable on the set $\{0, 1, \ldots, n\}$ is equal to $n(n+2)/12$.

Express your answer in terms of n using standard notation . Remember to write '*' for all multiplications and to include parentheses where necessary.

$\mathrm{var}(X) =$ n*(n+2)/3 ✔ **Answer:** n*(n+2)/3

Answer:
Following the hint, let $Y = X/2$. The random variable Y takes values in the set $\{0, 1, 2, \ldots, n\}$, each value having the same probability. Therefore, Y is uniform and has a variance of $n(n+2)/12$. Since $X = 2Y$,

$$\mathrm{var}(X) = \mathrm{var}(2Y) = 4 \cdot \mathrm{var}(Y) = \frac{4}{12} n(n+2).$$

You have used 1 of 2 submissions

Exercises 7 due Mar 02, 2016 at 23:59 UTC

Solved problems

Additional theoretical material

Problem Set 4
Problem Set 4 due Mar 02, 2016 at 23:59 UTC

Unit summary