



18. Exercise: Second generation offspring

Exercises due Mar 25, 2020 05:29 IST Completed

Exercise: Second generation offspring

2/2 points (graded)

Every person has a random number of children, drawn from a common distribution with mean 3 and variance 2. The numbers of children of each person are independent. Let M be the number of grandchildren of a certain person. Then:

$\mathbf{E}[M] =$

9

✓ Answer: 9

$\text{Var}(M) =$

24

✓ Answer: 24

Solution:

Let N be the number of children and let X_i be the number of children of the i th chld. Then, $M = X_1 + \dots + X_N$. It follows that $\mathbf{E}[M] = \mathbf{E}[N] \cdot \mathbf{E}[X] = 3 \cdot 3 = 9$. Furthermore,

$$\text{Var}(M) = \mathbf{E}[N] \text{Var}(X) + (\mathbf{E}[X])^2 \text{Var}(N) = 3 \cdot 2 + 9 \cdot 2 = 24.$$

Submit

You have used 2 of 3 attempts

i Answers are displayed within the problem

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Hint for how to solve this sucker

6

Don't panic. Write it out. Part (a): What is a grandchild? What is the grandchild's relationship to the infor...



Is this statistics true?

1

ie Mean children = 3



Hint

9

Any hint which formula to use or how to proceed?



Solution

1 new_

I tried to solve this problem but my answers were wrong. Seeing the solution, I understand the calculatio...



Now do great-grandchildren

1

Once you have the mean and variance of number of grandchildren, you can use the same approach for t...



This question stumped me for a while

1

Didn't want to do rote deployment of formulas. Ended up overthinking things a bit (I guess). Was thrown ...



Variance greater than Expectation.

1 new_

Can the Standard Deviation of a random variable be greater than the Expected value of that random vari...



Question about an alternative solution

2

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