

MITx: 14.310x Data Analysis for Social Scientists

Heli



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Module 5: Moments of a Random Variable, Applications to Auctions, & Intro to Regression > Expectation, Variance, and an Introduction to Regression > An Example: Unconditional Expectation and Variance - Quiz

An Example: Unconditional Expectation and Variance - Quiz

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Use the following information for each of the following questions: Suppose that you are the swim coach for athletes that will be going to the Olympic Games to compete in swimming. Your athletes must swim in the heats and place highly enough or swim a fast enough time to make it through to the final race. Suppose that the probability of making the final race, p_F , is 0.4 or 40% for each athlete and each athlete's outcome is independent.

Question 1

1/1 point (graded)

Using the same set up as in the previous question (recopied above for convenience), suppose that the team size N is now a random variable with expectation 2 and variance 1.5. What is the expectation of the number of swimmers that make it to the final?

Please round your answers to 2 decimal places (e.g. if you obtain 0.443, round to 0.44 and if you obtain 0.445, round to 0.45).

0.8 **✓** Answer: 0.80

 ▼ Module 5: Moments of a Random Variable, Applications to Auctions, & Intro to Regression

Moments of a Distribution and Auctions

Finger Exercises due Oct 31, 2016 at 05:00 IST

Expectation, Variance, and an Introduction to Regression

Finger Exercises due Oct 31, 2016 at 05:00 IST

Module 5: Homework

Homework due Oct 24, 2016 at 05:00 IST

Exit Survey

Explanation

Using the law of iterated expectations,

$$E[F] = E[E[F|N]] = E[Np_F] = p_F E[N] = 0.4 * E[N] = 0.4 * 2 = 0.8$$

Submit

You have used 1 of 2 attempts

Correct (1/1 point)

Question 2

1/1 point (graded)

What is the variance of the number of swimmers that make it to the final?

Please round your answers to 2 decimal places (e.g. if you obtain 0.443, round to 0.44 and if you obtain 0.445, round to 0.45).

0.72

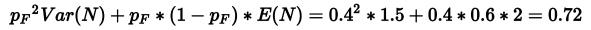
✓ Answer: 0.72

0.72

Explanation

Using the law of total variance:

$$Var(F) = Var(E[F|N]) + E[Var(F|N)] = Var(Np_F) + E[Np_F(1-p_F)] =$$



Submit

You have used 1 of 2 attempts

Correct (1/1 point)

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