



Bookmarks

- ▶ [Module 1: The Basics of R and Introduction to the Course](#)
- ▶ [Entrance Survey](#)
- ▶ [Module 2: Fundamentals of Probability, Random Variables, Distributions, and Joint Distributions](#)
- ▶ [Module 3: Gathering and Collecting Data, Ethics, and Kernel Density Estimates](#)
- ▶ [Module 4: Joint, Marginal, and Conditional Distributions & Functions of Random Variable](#)

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

An Example: Conditional Expectation - Quiz

🔖 Bookmark this page

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 high 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)

Your team has 8 people. What is the probability that 2 athletes make it into the final race?

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).


✓ Answer: 0.21

0.21


Explanation

▼ **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**

Similar to the example given in class, the key piece of information given here is that “making it to the final” follows a binomial distribution, where $F|N = n \sim B(n, 0.4)$, where F refers to the number “making it to the final,” and N refers to the size of your team. To calculate the probability that 2 of the athletes make it into the final race, use the following:

$$P(F = 2|N = 8) = \binom{n}{x} p_F^x (1 - p_F)^{n-x} = \frac{8!}{2!6!} (0.4)^2 (0.6)^6 = 0.21$$

You can also calculate this probability in R, using the command `dbinom(2,8,0.4)`.

Submit

You have used 1 of 2 attempts

✓ Correct (1/1 point)

Question 2

1/1 point (graded)

What is the expected number of athletes that make it into the finals?

3.2

✓ Answer: 3.2

3.2

Explanation

The expectation for a binomial distribution is given by:

$$E[F|N = 8] = np_F = 8 * 0.4 = 3.2$$

or roughly 3 of the swimmers.

Submit

You have used 1 of 2 attempts

✓ Correct (1/1 point)

[Show Discussion](#)

Add A Post

© All Rights Reserved



© 2016 edX Inc. All rights reserved except where noted. EdX, Open edX and the edX and Open EdX logos are registered trademarks or trademarks of edX Inc.



