Bookmarks

- Module 1: The Basics of R and Introduction to the Course
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- Module 4: Joint, Marginal, and Conditional Distributions & Functions of Random Variable

Long Question 2 - Prof. Ellison's Commute

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Sara Elison needs to commute to MIT everyday. She currently lives near campus, but is considering moving to a place near Fenway stadium (Boston's baseball stadium). Her colleagues who live near there tell her that the commute from the office to the Fenway is independent across days and follows a $\mathcal{N}(20, 9)$ on days where there is a home game at Fenway and $\mathcal{N}(12, 4)$ on other days.

Question 8

0.0/1.0 point (graded)

What is the probability that the commute on a particular game day exceeds 22 minutes?

Please round your answer to 2 decimal points, e.g. if your answer is 0.987, please round to .99 and if it is 0.981, round to 0.98)

0.41 ✖

0.41

Submit You have used 1 of 1 attempt

- Module 5: Moments of a Random Variable, Applications to Auctions, & Intro to Regression
- Module 6: Special Distributions, the Sample Mean, the Central Limit Theorem, and Estimation
- Module 7: Assessing and Deriving Estimators - Confidence Intervals, and Hypothesis Testing
- Module 8: Causality, Analyzing Randomized Experiments, & Nonparametric Regression
- Module 9: Single and Multivariate Linear Models
- Module 10: Practical Issues in Running

Question 9

1/1 point (graded)

What is the probability that all commutes on a particular 3-game homestand (3 games played at Fenway) exceed 22 minutes?

Please round your answer to 2 decimal points)

0.02 ✔ **Answer:** 0.02

$$0.02$$

Explanation

We want the probability that the commute is greater than 22 minutes on three days. But these are independent events, hence the answer is given by:

$$P(X_1 > 22\, AND\, X_2 > 22\, AND\, X_3 > 22) = P(X_G > 22)^3 = 0.2514^3 = 0.01588897274 \approx 0.0$$

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✔ Correct (1/1 point)

Question 10

1/1 point (graded)

Regressions, and Omitted Variable Bias

- Module 11: Intro to Machine Learning and Data Visualization
- Module 12: Endogeneity, Instrumental Variables, and Experimental Design
- Exit Survey
- **Final Exam**

Final Exam
Final Exam due Dec 19, 2016 05:00 IST

What is the probability that the commute on a particular game day exceeds the commute on a particular non-game day?

Please round your answer to 2 decimal points

0.99 ✔ **Answer:** 0.99

0.99

Explanation
Let $X_N \sim N(12, 4)$ be the commute distribution on a non-game day. We want to find $P(X_G > X_N) = P(X_G - X_N > 0) = 1 - P(X_G - X_N \leq 0)$. But since X_G and X_N are independent normal distributions, $X_G - X_N \sim N(22 - 12, 9 + 4)$. Hence,

$$1 - P(X_G - X_N \leq 0) = 1 - P(Z \leq \frac{0-8}{\sqrt{13}}) = P(Z \leq \frac{8}{\sqrt{13}}) = 0.9868$$

Submit You have used 1 of 1 attempt

✔ Correct (1/1 point)

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