Review Test Submission: Practice M1

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Course	-CSE 544.01 Probability and Statistics for Data Scientists - Spring 2022
Test	Practice M1
Started	3/7/22 7:35 PM
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Status	Completed
Attempt Score	100 out of 100 points
Time Elapsed	4 minutes out of 30 minutes
Results Displayed	All Answers, Submitted Answers, Correct Answers

Question 1

10 out of 10 points

Consider the {C, S, R} Markov chain exactly as in lec 9, slide 15. What is the long-term probability of being in state R? Report your answer with exactly one digit before the decimal and rounded to two digits after the decimal. For example, report 0.004 as 0.00, report 3.333 as 3.33, report 1.106 as 1.11, and report 2.704 as 2.70.

Selected Answer: ✓ 0.11

Correct Answer:

Evaluation Method	Correct Answer	Case Sensitivity
✓ *Exact Match*	0.11	

Question 2

10 out of 10 points

Let X be distributed as Uniform(0,1) and Y be distributed as Uniform(0,2). Let X and Y be independent. What is Pr(X < Y)?

Selected Answer: ✓ 0.75

Answers:

0.00

0.50

None of the listed

✓ 0.75

0.25

1.00

Question 3

10 out of 10 points

Consider a new continuous distribution X defined in (0, 3) with p.d.f. f(x) = C x, where C is some constant. Note that f(x) = 0 outside the (0, 3) range. What is E[X]?

Report your answer with exactly one digit before the decimal and rounded to two digits after the decimal. For example, report 0.004 as 0.00, report 3.333 as 3.33, report 1.106 as 1.11, and report 2.704 as 2.70.

Selected Answer: 2.00

Correct Answer:

Evaluation Method	Correct Answer	Case Sensitivity
Exact Match	2.00	

Question 4

10 out of 10 points

Let Skew(X) = $E[(X-\mu)^3] / \sigma^3$ for a RV X with mean μ and variance σ^2. Find the plug-in estimator for Skew(X) given iid sample data drawn from X as D = {3, 1, 2}. Report your answer with exactly 1 digit before the decimal and rounded to 2 digits after the decimal. For example, report 2.704 as 2.70, -1.009 as -1.01, 0 as 0.00.

Selected Answer: 0.00

Correct Answer:

Evaluation Method	Correct Answer	Case Sensitivity
Exact Match	0.00	

Question 5

10 out of 10 points

You are given data samples D = {1.9, -0.3, 4.2, 4.2, -2.1, 1.9, -2.1, -2.1} drawn i.i.d. from some true but unknown distribution, X. What is the eCDF of X at 3?

Report your answer with exactly one digit before the decimal and rounded to two digits after the decimal. For example, report 0.004 as 0.00, report 3.333 as 3.33, report 1.106 as 1.11, and report 2.704 as 2.70.

Selected Answer: 0.75

Correct Answer:

Evaluation Method	Correct Answer	Case Sensitivity
Exact Match	0.75	

Question 6

10 out of 10 points

Refer to slide 4 from lec 3. Consider the same scenario, that is, 6 students receive vaccines such that 2 get PF, 2 get MD, and 2 get AZ. What is the probability that students 1 and 2 get the same vaccine?

Report your answer with exactly one digit before the decimal and rounded to two digits after the decimal. For example, report 0.004 as 0.00, report 3.333 as 3.33, report 1.106 as 1.11, and report 2.704 as 2.70.

Selected Answer: 0.20

Correct Answer:

Evaluation Method	Correct Answer	Case Sensitivity
Exact Match	0.20	

Question 7

10 out of 10 points

Assume that POE is defined for independent RVs X and Y as E[X Y] = 2 E[X] E[Y]. If LOE is defined the same way as in class, then with this new definition of POE, which of the following is the correct result for LOV for independent RVs X and Y?

Selected Answer: Var(X + Y) = Var(X) + Var(Y) + E[X Y]

Answers:
- Var(X + Y) = Var(X) + Var(Y) + E[X] E[Y]
- Var(X + Y) = Var(X) + Var(Y) + E[X Y]
- None of the listed
- Var(X + Y) = Var(X) + Var(Y)
- Var(X + Y) = Var(X) + Var(Y) + 2 E[X Y]

Question 8

10 out of 10 points

Let $\{X_1, X_2, ..., X_n\}$ be i.i.d. with some true but unknown distribution X with mean u > 1. Define an estimator of u as $M=(1+X_2) / 3$. Which of the following statements is true.

Selected Answer: bias(M) < 0

Answers:
- bias(M) < 0
- bias(M) > 0
- M is an unbiased estimator
- None of the listed

Question 9

10 out of 10 points

You are given data samples D = {3, 6, -2, 9, 16, -1, 5, 7, 17}. Using Tukey's rule with α = 1.5, which of the following will be classified as an outlier?

Selected Answer: None of the listed.

Answers:
- None of the listed.
- 17
- -2
- 16
- -1

Question 10

10 out of 10 points

Refer to slide 13 from lec 2. This time, consider that the coin is not fair, and has Pr(H) = 3/5 and Pr(T)=2/5. The rest of the experiment is the same. What is Pr(die roll > 1)? Report your answer with exactly one digit before the decimal and rounded to two digits after the decimal. For example, report 0.004 as 0.00, report 3.333 as 3.33, report 1.106 as 1.11, and report 2.704 as 2.70.

Selected Answer: 0.72

Correct Answer:

Evaluation Method	Correct Answer	Case Sensitivity
Exact Match	0.72	

Wednesday, March 9, 2022 1:27:53 AM EST

← **OK**