Week 2 Practice Quiz

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Excellent!

1 / 1 points

1.
Which of the following statements is true?

- The prior is a mixture between the posterior and likelihood.
- The posterior is a mixture between the prior and likelihood.

Correct Response

This question refers to the following learning objective(s):

- Define the concepts of prior, likelihood, and posterior probability and identify how they relate to one another

- The likelihood is a mixture between the prior and posterior.

1 / 1 points

2.

Which of the following distributions would be a good choice of prior to use if you wanted to determine if a coin is fair when you have a **strong** belief that the coin is fair? (Assume a model where we call heads a success and tails a failure).

- [x] Beta(50, 50)

Correct Response

This question refers to the following learning objective(s):

- Elicit prior beliefs about a parameter in terms of a Beta, Gamma, or Normal distribution

- [ ] Beta (1, 1)
- [ ] Beta(10, 90)
- [ ] Beta(9, 1)
- [ ] Beta (10, 10)

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1 / 1 points

3.

If Amy is trying to make inferences about the average number of customers that visit Macy's between noon and 1 p.m., which of the following distributions represents a conjugate prior?

- [ ] Beta
- [ ]

Poisson

Normal

Gamma

Correct Response

This question refers to the following learning objective(s):

- Understand the concept of conjugacy and know the Beta-Binomial, Poisson-Gamma, and Normal-Normal conjugate families

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1 / 1 points

4.

Suppose that you sample 24 M&Ms from a bag and find that 3 of them are yellow. Assuming that you place a uniform Beta(1,1) prior on the proportion of yellow M&Ms p, what is the posterior probability that $p < 0.2$?

0.60

0.69

0.77

Correct Response

This question refers to the following learning objective(s):

- Make inferences about a proportion using a conjugate Beta prior
- Make inferences about a rate of arrival using a conjugate Gamma prior

- Update prior probabilities through an iterative process of data collection

○ 0.92

✔ 1 / 1 points

5.

Suppose you are given a coin and told that the coin is either biased towards heads (p = 0.6) or biased towards tails (p = 0.4). Since you have no prior knowledge about the bias of the coin, you place a prior probability of 0.5 on the outcome that the coin is biased towards heads. You flip the coin twice and it comes up tails both times. What is the posterior probability that your next two flips will be heads?

○ 0.2

○ 0.212

◉ 0.222

Correct Response

This question refers to the following learning objective(s):

- Derive the posterior predictive distribution for very simple experiments
- Work with the discrete form of Bayes' rule

○ 0.25