! This class has been made inactive. No posts will be allowed until an instructor reactivates the class.

question @36 stop following 13 views

Actions

Problem 6.7(b)

7. Prior vs. posterior predictive checks (from Gelman, Meng, and Stern, 1996): consider 100 observations, $y_1, \ldots, y_n$, modeled as independent samples from a $N(\theta, 1)$ distribution with a diffuse prior distribution, say, $p(\theta) = \frac{1}{2A}$ for $\theta \in [-A, A]$ with some extremely large value of A, such as 10^5. We wish to check the model using, as a test statistic, $T(y) = \max_i |y_i|$: is the maximum absolute observed value consistent with the normal model? Consider a dataset in which $\overline{y} = 5.1$ and $T(y) = 8.1$.
   (a) What is the posterior predictive distribution for y^{rep}? Make a histogram for the posterior predictive distribution of $T(y^{\text{rep}})$ and give the posterior predictive p-value for the observation $T(y) = 8.1$.
   (b) The prior predictive distribution is $p(y^{\text{rep}}) = \int p(y^{\text{rep}}|\theta)p(\theta)d\theta$. (Compare to equation (6.1).) What is the prior predictive distribution for y^{rep} in this example? Roughly sketch the prior predictive distribution of $T(y^{\text{rep}})$ and give the approximate prior predictive p-value for the observation $T(y) = 8.1$.
   (c) Your answers for (a) and (b) should show that the data are consistent with the posterior predictive but not the prior predictive distribution. Does this make sense? Explain.

I think I'm just confused on where to start. How do they get the prior predictive distribution and p-value? I have a function but I don't believe it's correct because I'm missing $p(y^{rep}|\theta)$. Is the answer not in closed form?

hw4

Edit good question | 0 Updated 2 years ago by Charles Hwang

the students' answer, *where students collectively construct a single answer*

Actions

I am not sure whether I did it correctly,
but I just plugged these distributions into the equation of p(yrep) in the problem.
yrep|θ~ N(θ,1) and θ~uniform(-A, A)

Edit thanks! | 0 Updated 2 years ago by Jinyoung Park

followup discussions *for lingering questions and comments*

Start a new followup discussion

Compose a new followup discussion