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Actions

Problem 10.3(b)

3. Posterior computations for the binomial model: suppose $y_1 \sim \text{Bin}(n_1, p_1)$ is the number of successfully treated patients under an experimental new drug, and $y_2 \sim \text{Bin}(n_2, p_2)$ is the number of successfully treated patients under the standard treatment. Assume that y_1 and y_2 are independent and assume independent beta prior densities for the two probabilities of success. Let $n_1 = 10, y_1 = 6$, and $n_2 = 20, y_2 = 10$. Repeat the following for several different beta prior specifications.
   (a) Use simulation to find a 95% posterior interval for $p_1 - p_2$ and the posterior probability that $p_1 > p_2$.
   (b) Numerically integrate to estimate the posterior probability that $p_1 > p_2$.

I'm having trouble doing this in *R*. I graphed both beta distributions and the difference between them in Desmos, but I don't think the plot makes sense visually. I'm looking at the uploaded code but I wasn't sure what to put for the functions? How close is it supposed to be to the probability from problem 10.3(a)? My answers differ by ~ 0.08, but it's not from the uploaded code so I'm not sure if it's right. I also tried integrating "manually", but since $\hat{p}_1 = \frac{6}{10} = 0.6$ and $\hat{p}_2 = \frac{10}{20} = 0.5$, the probability that $p_1 > p_2$ intuitively should be $(0.5, 1]$ and my answer was outside this range.

hw5

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

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