hw08

1 BR 13.7

Plans change. Hotel room bookings get canceled. In the next exercises, you'll explore whether hotel cancellations might be predicted based upon the circumstances of a reservation. Throughout, utilize weakly informative priors and the `hotel_bookings` data in the {bayesrules} package. Your task is to predict `is_cancelled` (Y, whether or not the booking was cancelled) based on the following predictors:

- `lead_time`: number of days between the booking and scheduled arrival (X_1)
- `previous_cancellations`: number of previous times the guest has cancelled a booking (X_2)
- `is_repeated_guest`: whether or not the booking guest is a repeat customer at the hotel (X_3)
- `average_daily_rate`: the average per day cost of the hotel (X_4)

(a) Using formal mathematical notation, specify an appropriate Bayesian regression model of Y by predictors X_1, X_2, X_3, X_4
(b) Simulate the posterior model of the regression parameters ($\beta_0, \beta_1, ..., \beta_4$).
(c) Construct trace plots, density plots, and a `pp_check()` of the chain output.
(d) Report the posterior median model of hotel cancellations on each of the log(odds), odds, and probability scales.
(e) Construct 80% posterior credible intervals for your model coefficients. Interpret those for β_2 and β_3 on the odds scale.
(f) Among the four predictors, which are significantly associated with hotel cancellations, both statistically and meaningfully? Explain.

2 BR 13.9

A guest that is new to a hotel and has only canceled a booking 1 time before, has booked a $100 per day hotel room 30 days in advance.

(a) Simulate, plot, and discuss the posterior predictive model of Y, whether or not the guest will cancel this booking.s

(b) Come up with the features of another fictitious booking that's more likely to be canceled than the booking in part a. Support your claim by simulating, plotting, and comparing this booking's posterior predictive model of Y to that in part a.

3 TBA Mon

4 TBA Mon

5 TBA Wed