Week 4 Lab

Quiz, 12 questions

12/12 points (100%)

Congratulations! You passed!

Next Item

1 / 1 point

1.
Is this an observational study or an experiment?

- [x] Observational study

Correct
Correct.

- [ ] Experiment

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1 / 1 point

2.
Which of the following statements is **false** about the distribution of weekly wages?

- [ ] The median of the distribution is 905.
- [ ] 25% of respondents make at least 1160 dollars per week.
- [x] 10 of the respondents make strictly less than 300 dollars per week.

Correct
Correct.

- [ ] wage is right-skewed, meaning that more respondents fall below the mean wage than above it.

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1 / 1 point

3.

Fit a new model that uses **educ** (education) to predict average weekly wages. Using the estimates from the R output, write the equation of the posterior mean of the regression line and obtain a 95% credible interval for the coefficients.

What does the slope tell us in the context of the relationship between education and earnings?

- Each additional year of education increases weekly wages by $60.21.
- Each additional year of education increases weekly wages by $146.95.
- For each additional year of education, there is a 95% chance that average weekly wages will possibly decrease by $5.56 or increase by $299.47.
- For each additional year of education, there is a 95% chance that average weekly wages will increase by $49.04 to $71.39

Correct

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1 / 1 point

4.

Which of the following statements about the residual plots are **false**?

- The residuals appear to be randomly distributed around 0
- The residuals are strongly left skewed, hence the normal distribution of errors condition is not met

Correct

- The variability of residuals appears to increase as the fitted increase, suggesting that the constant variance assumption does not hold.
- There are more individuals where the model under predicts weekly wages rather than over estimates weekly wages.

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1 / 1 point

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5.
Using the definition of outlier above, which statement is **false**?

- Case 434 has a probability of close to 1 that it an outlier under the normal error model for regressing **lwage** on iq
- Case 514 has a probably of close to 1 that it an outlier under the normal error model for regressing **lwage** on iq
- Case 616 has a probably of close to 1 that it an outlier under the normal error model for regressing **lwage** on iq

Correct

- Case 784 has a probably of close to 1 that it an outlier under the normal error model for regressing **lwage** on iq

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1 / 1 point

6.
Use the new value of k to calculate the posterior probability of each observation being an outlier. Which observation has a posterior probability of being an outlier that exceeds the prior probability of being an outlier?

- Case 434
- Case 514
- Case 616
- Case 784

Correct

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1 / 1 point

7.
From the model, all else begin equal, who would you expect to make more: a married black man or a single non-black man?

- The married black man

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- [ ] The single non-black man

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1 / 1 point

8.
Elimination of which variable from the full model yielded the lowest BIC?

- [ ] brthord
- [ ] sibs
- [x] feduc

Correct
Correct.

- [ ] meduc

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1 / 1 point

9.
Based on this reduced data set, according to Bayesian model averaging, which of the following variables has the lowest marginal posterior inclusion probability?

- [ ] kww
- [ ] black
- [ ] south
- [x] age

Correct
Correct.

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1 / 1 point

12/12 points (100%)

10.

True or False: The naive model with all variables included has posterior probability greater than 0.5. (Use a Zellner-Siow null prior for the coefficients and a $\text{Beta}(1, 1)$ prior for the models.)

- True
- False

Correct

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1 / 1 point

11.

Based on these results, which covariates are included in **all** of the following: the best predictive model, the median probability model, and the highest posterior probability model?

- kww, married, urban
- married, age, black
- black, south, married
- meduc, urban, married

Correct

---

1 / 1 point

12.

Repeat these calculations for a 95% prediction interval for the individual who is predicted to have the highest predicted wages based on the best predictive model.

- [414, 1717]
- [782, 1571]
- [782, 3154]

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Correct

[706, 2950]