ST 705 Linear models and variance components
Homework problem set 10

March 30, 2020

1. (2 points) Exercise 5.9 from Monahan.

2. (2 points) Exercise 5.10 from Monahan.

3. (2 points) Exercise 5.11 from Monahan.

4. (2 points) Exercise 5.12 from Monahan.

5. (2 points) Exercise 5.14 from Monahan.

6. (2 points) Exercise 5.16 from Monahan.

7. (2 points) Exercise 5.23 from Monahan.

8. (2 points) Exercise 5.25 from Monahan.

9. (2 points) Exercise 5.27 from Monahan.

Optional lab problems

1. Exercise 5.3 parts a, b, c from Monahan.

2. Let U and V be independent $N(0,1)$ random variables, and define $Y := V$ and

$$X := \begin{cases} U & \text{if } UV \geq 0 \\ -U & \text{if } UV < 0 \end{cases}$$

   (a) Show that X and Y each follow the standard normal distribution, but that (X, Y) is not bivariate normal.

   (b) Show that X^2 and Y^2 are independent.