STAT 3008
Exercises 5

   Problems refer to the problem sets in the textbook: Applied Linear Regression, 3rd edition by Weisberg.

1. Problem 3.1.2 and 3.1.3.
   For problem 3.1.3, do also

       i A F-test for the dependence of *Soma* on *HT*9, and compare with the t-test.

       ii A F-test for the dependence of *Soma* on *HT*9 and *WT*9.

       iii At the point $HT2 = 50$, $WT2 = 15$, $HT9 = 100$, $WT9 = 30$, $ST9 = 10$, find the

           a) 99% confidence interval for the fitted value of *Soma*.
           b) 99% prediction interval for a new observation of *Soma*.
           c) 99% confidence band for the fitted value of *Soma*.

2. Problem 3.4.

3. Let $n = 100$, $\hat{\beta} = (\hat{\beta}_1, \hat{\beta}_2)' = (7, 1)'$, $\hat{\sigma} = 2$,

$$X'X = \begin{pmatrix} 3 & 2 \\ 2 & 5 \end{pmatrix}.$$

   Find an inequality representing the 95% confidence ellipse for β. Stretch a graph for the ellipse. (Hints: Try to find some points that lie on the ellipse.)

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