Stat 3011 Second Midterm Exam (Computer Part) Nov. 16, 2000

Name ________________________________ Student ID ____________________

The exam is open book, open web pages. You may use the computer, a calculator, or pencil and paper to get answers, but it is expected that you will use the computer. **Show all your work!**

- For simple computer commands, you may write the **command** you used and the **result** it gave on this test form.
- For complicated commands or plots, make a printout and **attach the printout** to the test form (we'll provide a stapler).

No credit for numbers with no indication of where they came from!

An on-line version of the test is at the URL

http://leech.stat.umn.edu/geyer/t2

1. [15 pts.] Suppose a random variable T has Student's t distribution with 5 degrees of freedom.

   (a) Find the probability that T is greater than 2.0.

   (b) Find the probability that T is greater than 10.0.

   (c) Find the probability that T is greater than 2.0 in absolute value, that is, $\text{pr}(|T| > 2.0)$.

   (d) Find the t such that $\text{pr}(T > t) = 0.15$.

   (e) Find the t such that $\text{pr}(|T| > t) = 0.15$.

2. [20 pts.] The file

   http://leech.stat.umn.edu/geyer/t2/t2.dat

   contains a single variable named `height` consisting of measurements of height in centimeters of 15 students.

(a) Draw some sort of plot that shows you the shape of the distribution of the data. Hand in this plot.

(b) Make a 95% confidence interval for the true population mean, assuming the students are a random sample from some specified population.

(c) Does your plot from part (a) tell you anything about whether this confidence interval is approximately valid? If so, what?

(d) Make a 99% confidence interval for the true population mean, assuming the students are a random sample from some specified population.

3. [15 pts.] Recalculate using the computer the confidence interval we did by hand yesterday about the arthritis trial. The entire question is repeated below.

   A drug company has performed a randomized controlled trial of a new non-steroidal anti-inflammatory drug for treatment of arthritis. The control group got an old drug (ibuprofen) and the treatment group got the new drug. There were 250 patients in each group. The patients were randomly assigned to treatment or control. Treatments were deemed "successful" if the patient reported "acceptable" or better quality of life. The results were

	sample size	successes
new drug	250	213
control	250	194

   Calculate a 95% confidence interval for the difference of the true population proportions of successes for the two treatments.