Stat 3011 First Midterm Exam (Computer Part)October 18, 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 just 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!

The points for the questions total to 50.

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

```
http://www.stat.umn.edu/~charlie/tests/3011/t1/
```

It is password protected. The account name is

```
goldy
```

and the password is

```
GoGophers
```

1. [15 pts.] Suppose a random variable X has a normal distribution with mean 25 and standard deviation 10.

   (a) Find the probability that X is less than zero.

   (b) Find the probability that X is between 25 and 30.

   (c) Find the the 0.90 quantile of the distribution of X.

2. [15 pts.] A standard test for diabetes is based on glucose levels in the blood after fasting (not eating) for twelve hours. For healthy people the fasting blood glucose level has a normal distribution with mean 5.31 mmol/L (millimoles per liter) and standard deviation 0.58 mmol/L. For untreated diabetics the distribution of fasting blood glucose level is also normal but the mean is 11.74 mmol/L and the standard deviation is 3.50 mmol/L.

   (a) Find the probability that a healthy person has a fasting blood glucose above 6.5 mmol/L.

   (b) Find the probability that a healthy person has a fasting blood glucose below 6.5 mmol/L.

   (c) Find the probability that an untreated diabetic has a fasting blood glucose above 6.5 mmol/L.

   (d) Find the probability that an untreated diabetic has a fasting blood glucose below 6.5 mmol/L.

3. [20 pts.] The file

   `http://www.stat.umn.edu/geyer/3011/01/u1/sally.txt`

   contains a single variable named `sally` for which measurements on 300 individuals are recorded.

   (a) Draw some sort of plot that shows you the shape of the distribution of the data. (Hand in this plot. Be sure to **put your name on the plot** before sending it to the printer. Either put your name in quotes as one command or add the optional argument `main="Your name here"` to any plot command.)

   (b) Describe the shape of the distribution. Is it symmetric or skewed? If skewed, which way? Is it unimodal or multimodal? Are there any outliers?

(c) Find the mean.

(d) Find the median.

(e) Find the standard deviation.

(f) Find the interquartile range.

(g) If you had to pick one measure of center and one measure of spread from the four numbers just calculated, which would you pick? Explain. Make it clear which is the measure of center and which is the measure of spread.