

## Computing Lab Section #2

### 1. *Setting Things Up.*

Use your course directory, by typing: `elaine20: > cd s208.`

Make a file called **myrand.m** with the following lines:

```
function out=myrand(m,n,range)
%Returns a vector of draws
%of integers from 1 to n,
%with replacement
out=floor(rand(m,n)*range)+1;
```

Make a file called **bsample.m** with the following lines:

```
function out=bsample(orig)
%Function to create one resample from
%the original sample orig, where
%orig is the original data, and is a
%matrix with nrow observations and ncol variables
    [n,p]=size(orig);
    indices=myrand(1,n,n);
    out=orig(indices,:);
```

Make a file containing the complete 82 point law school data by downloading it from the class web directory, <http://www.stanford.edu/class/stats208/law82>. You can use `save as` in the netscape file option. Or you can copy the file `law82` from the `/usr/class/stats208/lab/` directory.

Start Matlab. Matlab is installed on all leland machines – elaine, tree, etc.

You should see the matlab prompt: `>>` Then type `format compact` to get more on your screen.

### 2. *Using the helpdesk to find some functions for which you don't know the exact name.* Type `helpdesk` at the matlab prompt and, in the new “help” window, go to “search” to find the name of the function that calculates the correlation coefficient.

**Question 1** *What's the name of the function that calculates the correlation coefficient? At the matlab prompt, try typing `help` followed by the name of this function and then `type` followed by the name of this function and briefly explain what each of the two functions `help` and `type` does. Type `lookfor correlation` and explain what the function `lookfor` does.*

### 3. *Using some of the GUI stat tools: `disttool` and `randtool`.*

Using the `randtool`, generate two poisson data of size 1000, one with parameter 1, one with parameter 2. To do that type `randtool` at the matlab prompt. Adjust the name of the distribution, the parameter value and the size of the dataset. To save data you generated using `randtool`, click on Output. Save data sets as Poisson1 and Poisson2. Return to Matlab and answer the following questions:

**Question 2** *What is the estimate of the standard error of the difference in Poisson means?*

**Question 3** *What is your estimate of the variance of the difference in Poisson means? Compare this estimate to the theoretical variance of the difference in Poisson means.*

**Question 4** *Make a histogram of the difference in the two Poisson random variables.*

4. *Working with law82 data.*

**Question 5** *Make a scatterplot of law82 dataset. To do that, you have to load the data into MATLAB by typing:*

```
load law82
```

**Question 6** *Write a modification to the function bsample that takes two arguments orig and k and creates one subsample of size k from orig. Call this function bsamplesizek and store it in a file called bsamplesizek.m*

Use your function to draw 1000 subsamples of size 15 from law82 dataset.

**Question 7** *Compute correlation coefficients for each of the subsamples and create a histogram.*