**Homework 8**
**36-325/725**
**due Friday Nov 2**

**NOTE:** Because of the test, this will be a short assignment.

(1) Let $X_1, \ldots, X_n \sim F$ and let $\hat{F}_n(x)$ be the empirical distribution function. Find the mean and variance of $\hat{F}_n(x)$ and show that, for each $x$, $\hat{F}_n(x) \xrightarrow{p} F(x)$.

(2) In R type:

```
data(quakes)
help(quakes)
names(quakes)
x <- quakes$mag
```

The data are magnitudes of earthquakes near Fiji. Estimate the cdf $F(x)$. Compute a 95 per cent confidence envelope for $F$.

Note: If you are interested in the data, try this:

```
pairs(quakes, main = "Fiji Earthquakes,
      N = 1000", cex.main=1.2, pch=".")
```

(3) Let $x$ and $y$ be two distinct points. Find $\mathrm{Cov}(\hat{F}_n(x), \hat{F}_n(y))$.