# Survival Analysis Project, Math 150

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After uploading the data, the first visualization I wanted to create was to see how many individuals are part of each treatment group out of the 4 we have outlined. This would be interesting to get a sense of the variety of treatments in the study. The graph below shows that only Treatments 1 and 2 are administered in the study. This is odd, since not a single participant got treatments 3 or 4.

```
tbl <- with(AIDSdata, table(txgrp))
barplot(tbl)
```
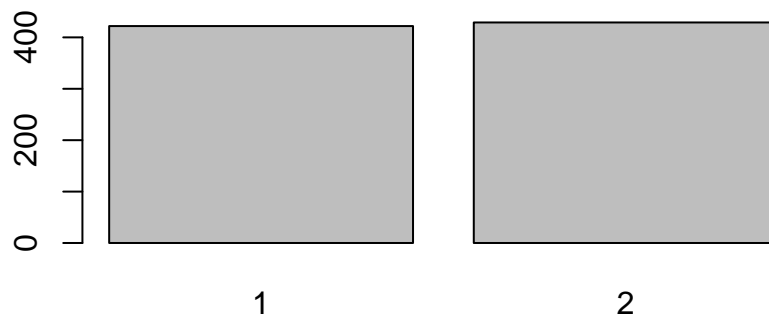

The next visualization I made was to plot the CD4 stratum at screening against the event indicator for AIDS defining diagnosis or death (censor variable). This was to get a sense of whether CD4 stratum levels in any way had a strong correlation with the censor variable.

```
ggplot(AIDSdata, aes(x=jitter(strat2), y=jitter(censor))) + geom_point()
```
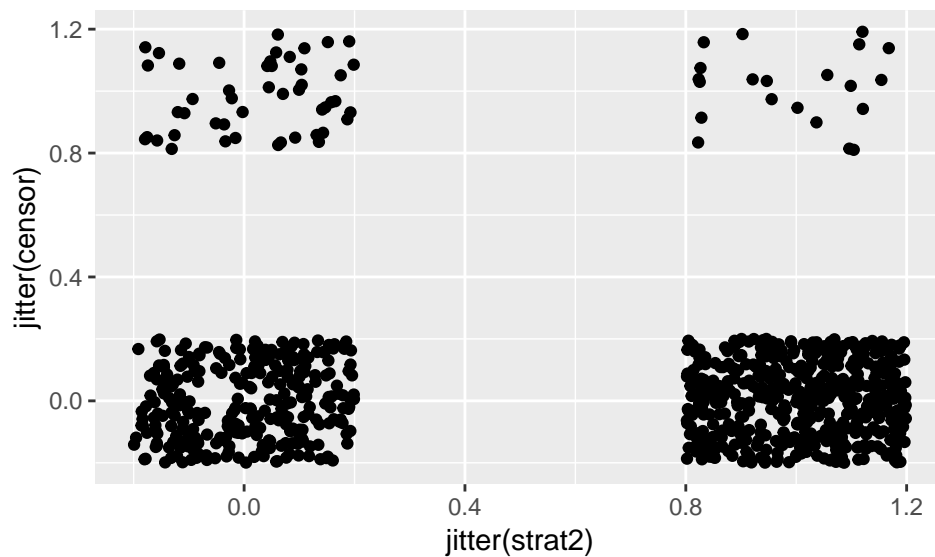

I made a few other visualizations but didn't really feel like they were useful enought to include.

Something new (Schoenfeld Residuals Test) :

A key assumption in the Cox Proportional Hazard model is that of proportional hazards. If the proportional hazard assumption holds, we can easily estimate the effect of different covariates without any consideration of the hazard function. The Schoenfeld Residuals represent the difference between observed and expected covariates given the risk set at that time. Plotting Schoenfeld Residuals against time can tell us whether or not the proportional hazards assumption has been violated. I will look at Schoenfeld Residuals as part of the something new aspect of the project.

The resources I will look at to understand more about this topic are:

1. https://stats.idre.ucla.edu/r/examples/asa/r-applied-survival-analysis-ch-6/

The link above has some Schoenfeld Residual tests in R. I will look at this to understand how the coding bit works.

2. http://192.248.16.117:8080/research/bitstream/70130/329/1/456-1844-1-PB%5b1%5d.pdf

The paper above is good for understanding the underlying theory behind Schoenfeld Residuals. It's also an applied paper, so it will be easier to understand.

As I come across more resources I will add to this list.