Lab 7

Non-Parametric Analysis of the DronesMetrics data.

Load file ‘DronesMetrics’

```
> attach(DronesMetrics)
```

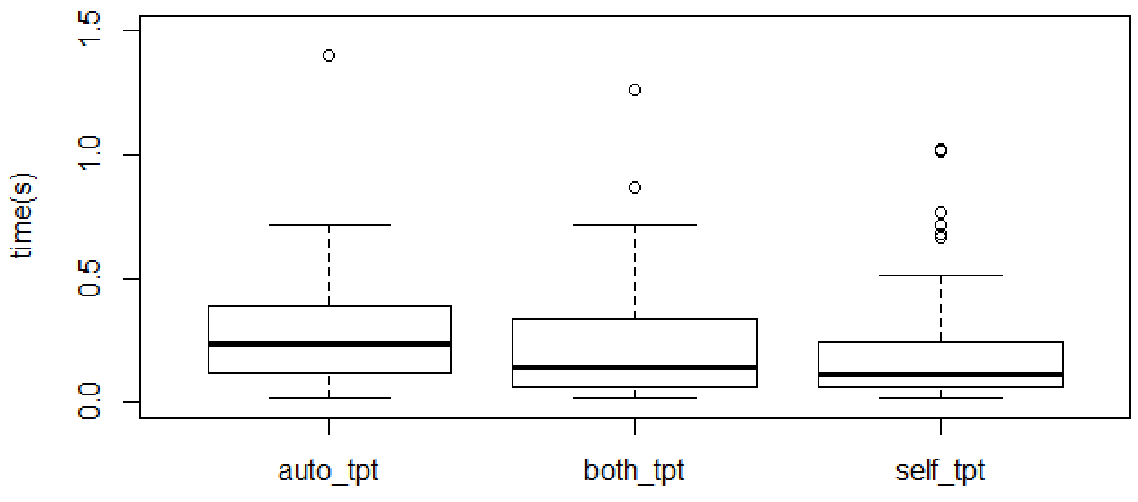
But we only want to work with part of this. So, let’s separate the TPT data into a new data frame.

```
> DM_tpt<-data.frame(auto_tpt,both_tpt,self_tpt)
> DM_tpt
  auto_tpt   both_tpt   self_tpt
1    0.520 0.63125000 0.21395833
2    0.080 0.04261603 0.07904000
3    0.360 0.22681818 0.23209302
4    0.240 0.31937500 0.41111111
5    0.380 0.36875000 0.32941177
6    0.400 0.71063830 0.68000000
```

(note, I’ve only include the first 6 rows to save space, you will have 68 rows)

We can explore these data by creating a boxplot (although we will probably want to set the y-axis to exclude some of the outlier values).

```
> boxplot(DM_tpt, ylab="time(s)", ylim=c(0, 1.5))
```



To run a Friedman ANOVA, we need to create a matrix of these data.

```
> TPTmatrix<-data.matrix(DM_tpt)
```

```
> friedman.test(TPTmatrix)

        Friedman rank sum test

data:  TPTmatrix
Friedman chi-squared = 8.8529, df = 2, p-value = 0.01196
```

This tells us that there is a main effect of condition on time per target, but not where any differences lie.
We can apply a Wilcoxon Signed Ranks Tests to explore pairwise comparisons.

```
test<-wilcox.test(auto_tpt, both_tpt, paired=TRUE)


        Wilcoxon signed rank test with continuity correction

data:  auto_tpt and both_tpt
V = 1462, p-value = 0.07793
alternative hypothesis: true location shift is not equal to 0
```

Notice that R produces a value of V, rather than z which we normally use.

```
> Zstat<-qnorm(test$p.value/2)
> Zstat
 [1] -1.762837
```

We can ignore the sign and just report this as z = 1.76.

It is also useful to report power, which can do using:

```
> abs(Zstat)/sqrt(38)
 [1] 0.2859699
```

Note that ‘38’ is the number of pairs in the analysis.

You can calculate Wilcoxon results for the other combinations of TPT.

Now you can do the same with the Beacon and the sensitivity (d.) data.