HW#2 Q3

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#a

```
library(readxl)
library(dplyr)
```

```
##
## Attaching package: 'dplyr'

## The following objects are masked from 'package:stats':
##
##     filter, lag

## The following objects are masked from 'package:base':
##
##     intersect, setdiff, setequal, union
```

```
fanbase <- read_excel("FanBase.xls")

fanbase$logTime <- log(fanbase$Time)

model <- aov(logTime ~ Person, data = fanbase)

TukeyHSD(model)
```

```
##   Tukey multiple comparisons of means
##     95% family-wise confidence level
##
## Fit: aov(formula = logTime ~ Person, data = fanbase)
##
## $Person
##              diff         lwr         upr     p adj
## BK-AR -0.22537843 -1.04913264  0.59837579 0.9906082
## DJ-AR  0.24274982 -0.58100440  1.06650403 0.9854267
## DR-AR  0.26720058 -0.55655363  1.09095480 0.9747438
## JW-AR  1.12326875  0.29951453  1.94702296 0.0011475
## MF-AR -0.27720147 -1.10095568  0.54655275 0.9690128
## RL-AR  0.20778389 -0.61597033  1.03153810 0.9942635
## TS-AR -1.31090586 -2.13466008 -0.48715165 0.0000620
## DJ-BK  0.46812824 -0.35562597  1.29188246 0.6594571
## DR-BK  0.49257901 -0.33117521  1.31633322 0.5981811
```

```
## JW-BK  1.34864717  0.52489296  2.17240139 0.0000330
## MF-BK -0.05182304 -0.87557725  0.77193117 0.9999995
## RL-BK  0.43316231 -0.39059190  1.25691653 0.7423938
## TS-BK -1.08552744 -1.90928165 -0.26177322 0.0019689
## DR-DJ  0.02445076 -0.79930345  0.84820498 1.0000000
## JW-DJ  0.88051893  0.05676472  1.70427315 0.0269250
## MF-DJ -0.51995128 -1.34370550  0.30380293 0.5285525
## RL-DJ -0.03496593 -0.85872015  0.78878828 1.0000000
## TS-DJ -1.55365568 -2.37740990 -0.72990147 0.0000009
## JW-DR  0.85606817  0.03231395  1.67982238 0.0353658
## MF-DR -0.54440205 -1.36815626  0.27935217 0.4670942
## RL-DR -0.05941669 -0.88317091  0.76433752 0.9999987
## TS-DR -1.57810645 -2.40186066 -0.75435223 0.0000005
## MF-JW -1.40047021 -2.22422443 -0.57671600 0.0000136
## RL-JW -0.91548486 -1.73923908 -0.09173065 0.0179512
## TS-JW -2.43417461 -3.25792883 -1.61042040 0.0000000
## RL-MF  0.48498535 -0.33876886  1.30873957 0.6173840
## TS-MF -1.03370440 -1.85745861 -0.20995018 0.0040180
## TS-RL -1.51868975 -2.34244397 -0.69493554 0.0000016
```

#b

```
# Use Tukey's HSD, because it gives confidence intervals for all pairwise comparisons while controlling
# error rates.

# Fisher's LSD would be too liberal here. Bonferroni and Scheffé both control error rates, but they are
# much more conservative than Tukey's HSD.
```

#c

```
# It should be a contrast, because the question is asking if TS is faster than all the others combined,
# not just one friend versus another.

# The contrast would be TS vs mean of seven other groups.
# That requires setting up a contrast.
```