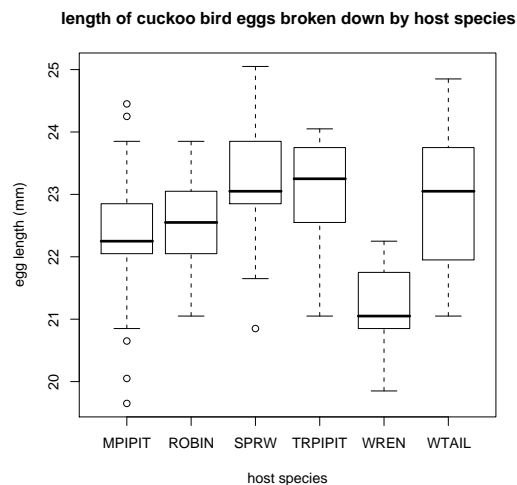


Cuckoo Egg Lengths: L.H.C. Tippett (1902-1985) was one of the pioneers in the field of statistical quality control, This data on the lengths of cuckoo eggs found in the nests of other birds (drawn from the work of O.M. Latter in 1902) is used by Tippett in his fundamental text. Cuckoos are known to lay their eggs in the nests of other (host) birds. The eggs are then adopted and hatched by the host birds.

```
> cuckoo <- read.table("cuckoo.csv", header=T, sep=",")
> attach(cuckoo)
> names(cuckoo)
[1] "bird"      "egg.length"
```

```
> boxplot(egg.length ~ bird, ylab="egg length (mm)", xlab="host species",
          main= "length of cuckoo bird eggs broken down by host species")
```



```
> tapply(egg.length,bird,mean)
MPIPIT  ROBIN  SPRW  TRPIPIT  WREN  WTAIL
22.29889 22.57500 23.12143 23.09000 21.13000 22.90333
```

```
> tapply(egg.length,bird,sd)
MPIPIT  ROBIN  SPRW  TRPIPIT  WREN  WTAIL
0.9206278 0.6845923 1.0687365 0.9014274 0.7437357 1.0676186
```

```
> table(bird)
bird
MPIPIT  ROBIN  SPRW  TRPIPIT  WREN  WTAIL
45      16      14      15      15      15
```

```
> aov(egg.length~bird)
Call:
  aov(formula = egg.length ~ bird)
```

Terms:

	bird	Residuals
Sum of Squares	42.93965	94.24835
Deg. of Freedom	5	114

Residual standard error: 0.9092524
Estimated effects may be unbalanced

```
> anova(aov(egg.length~bird))
Analysis of Variance Table
```

Response: egg.length

	Df	Sum Sq	Mean Sq	F value	Pr(>F)
bird	5	42.940	8.588	10.388	3.152e-08 ***
Residuals	114	94.248	0.827		

Signif. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1