DATA SCIENCE 101

Predicting with Data

Lab 4 Demonstration

May, 2020

UBC

Motor vibration (noise) has been measured for 5 samples of motors, each sample using a different brand of bearing.

Interest centers on whether there are differences in the mean vibration between brands.

```r
motor <- read.table("motor_vibration.txt",
    header=FALSE)
motor

##      V1    V2    V3    V4    V5
## 1 13.1 16.3 13.7 15.7 13.5
## 2 15.0 15.7 13.9 13.7 13.4
## 3 14.0 17.2 12.4 14.4 13.2
## 4 14.4 14.9 13.8 16.0 12.7
## 5 14.0 14.4 14.9 13.9 13.4
## 6 11.6 17.2 13.3 14.7 12.3
```

```r
names(motor) <- paste("Brand", 1:5)
head(motor, n=3)

##    Brand 1 Brand 2 Brand 3 Brand 4 Brand 5
## 1    13.1    16.3    13.7    15.7    13.5
## 2    15.0    15.7    13.9    13.7    13.4
## 3    14.0    17.2    12.4    14.4    13.2
```
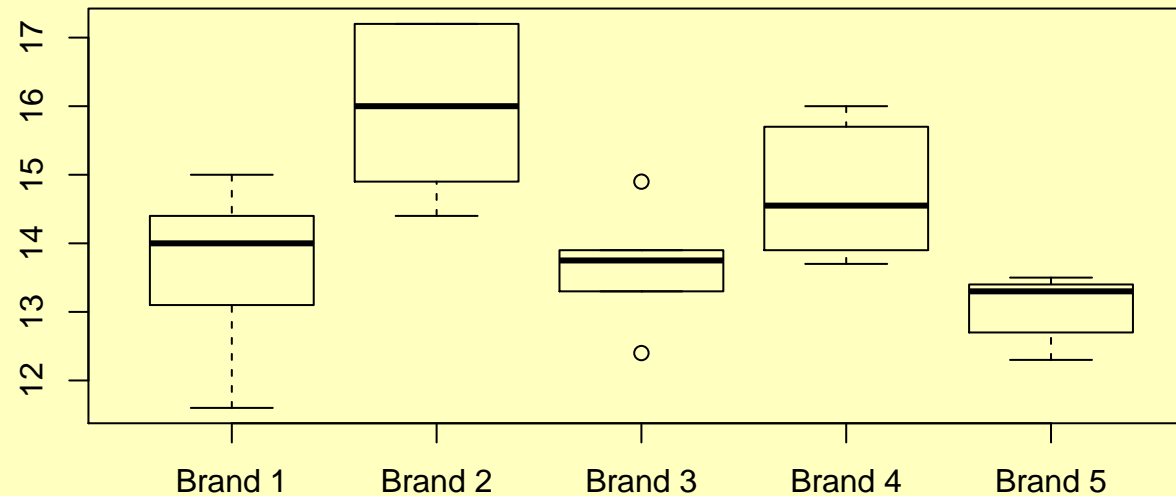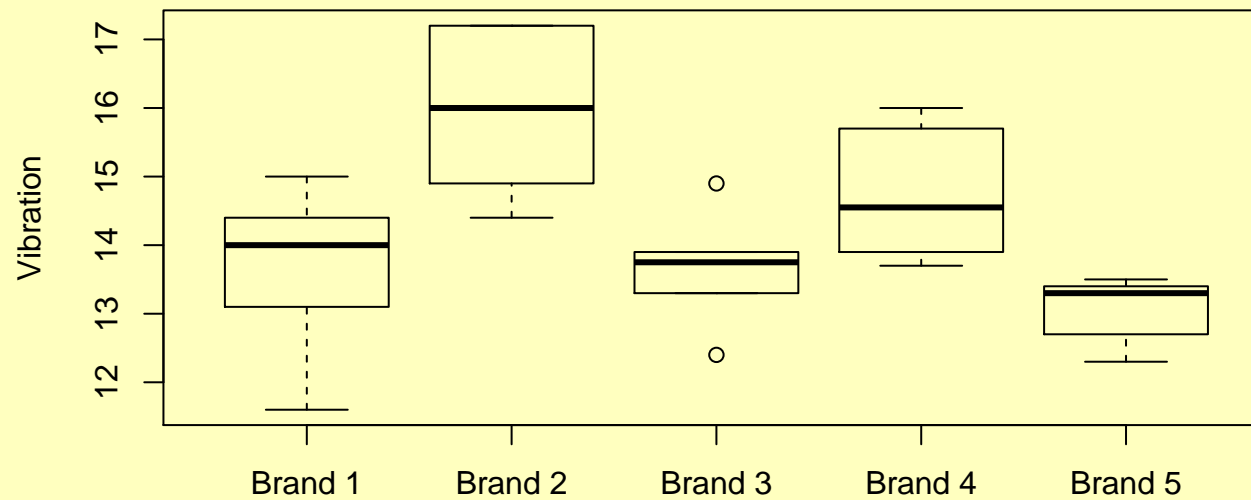
Draw a side-by-side boxplot to make the comparison.

```
boxplot(motor)
```

```
boxplot(motor, ylab="Vibration")
```
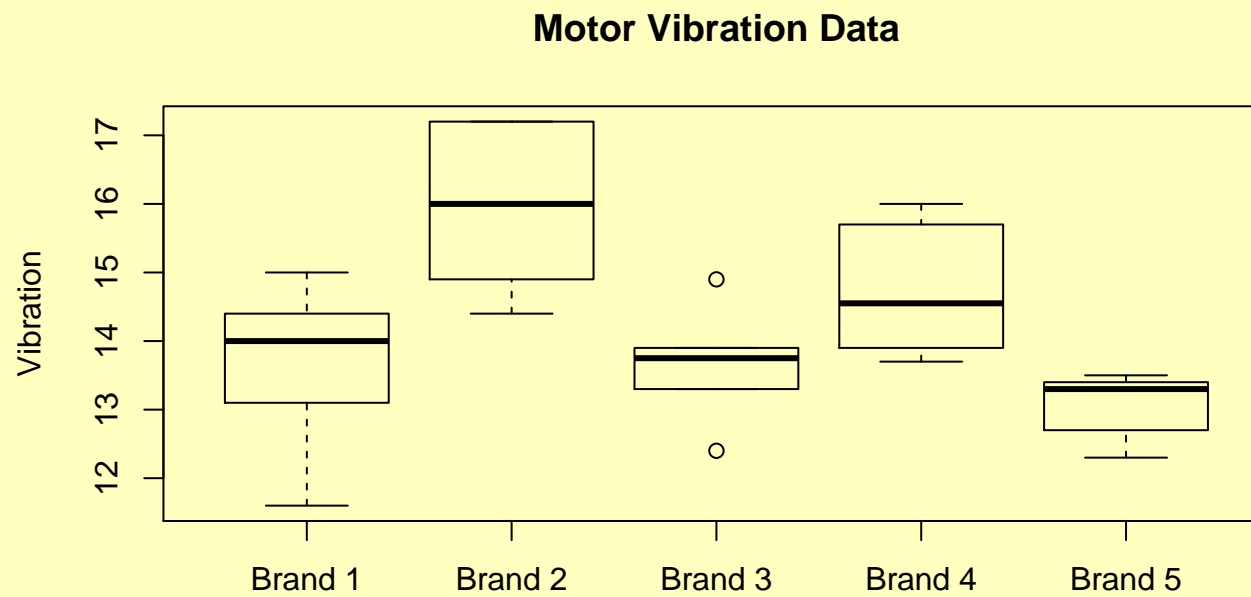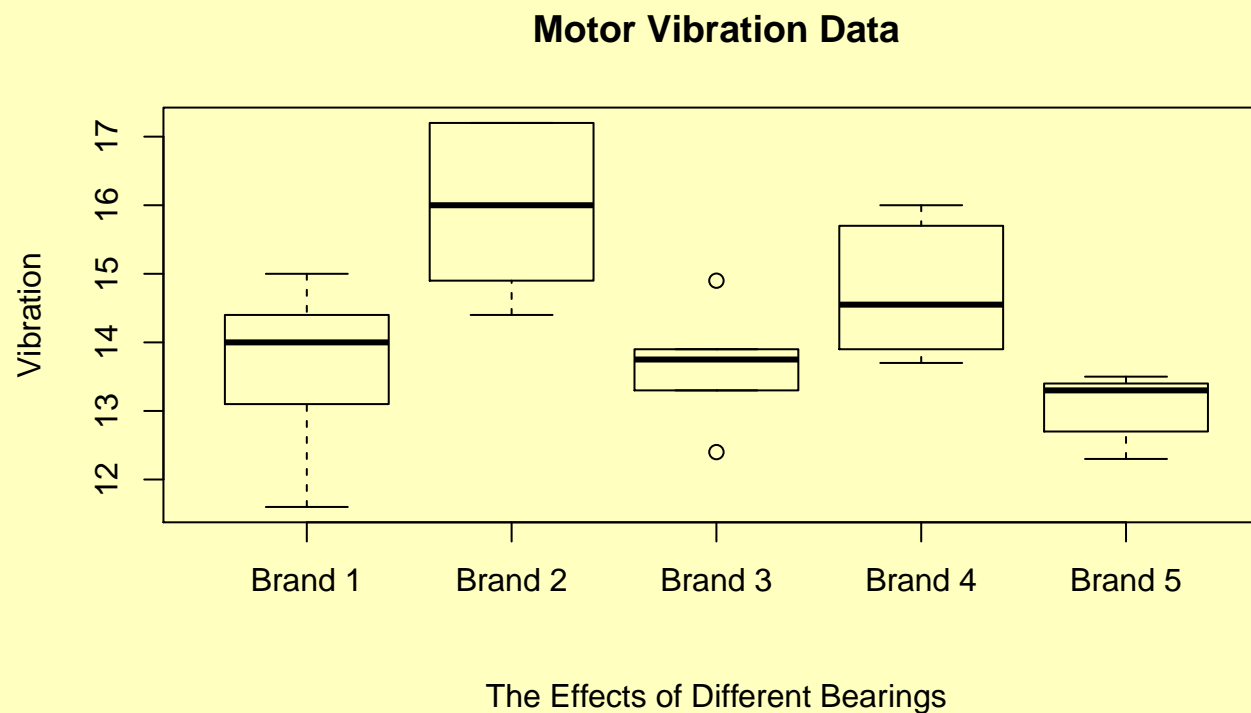
Add a Title

```
boxplot(motor, ylab="Vibration")
title("Motor Vibration Data")
```


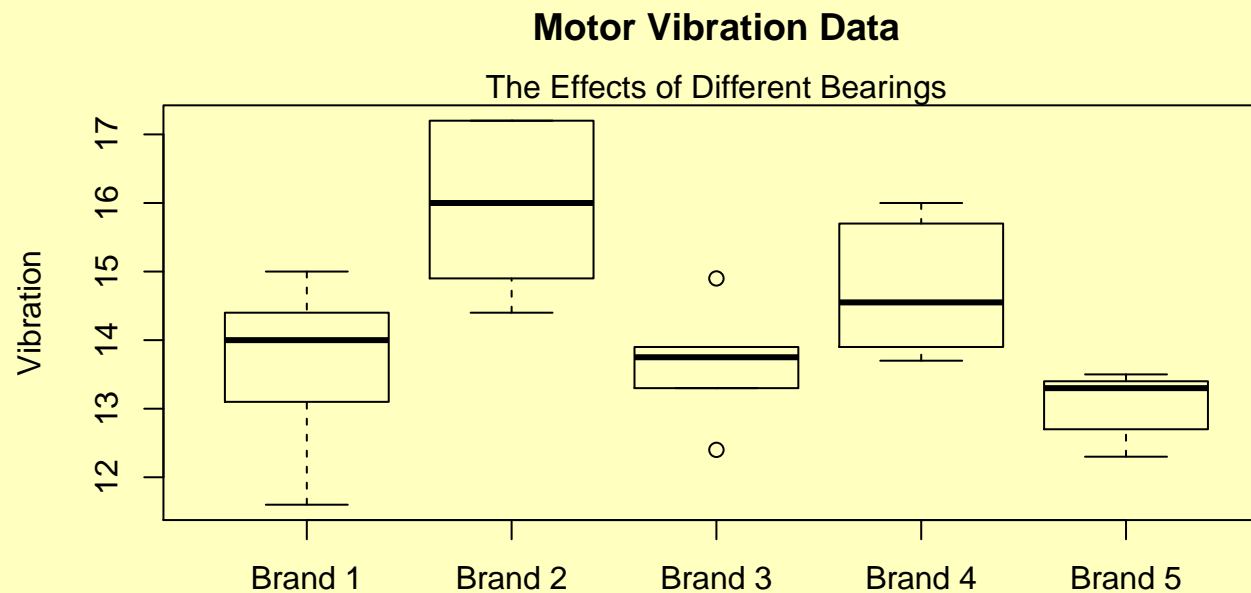**Motor Vibration Data**

```
boxplot(motor, ylab="Vibration")
title(main="Motor Vibration Data",
    sub="The Effects of Different Bearings")
```


Motor Vibration Data
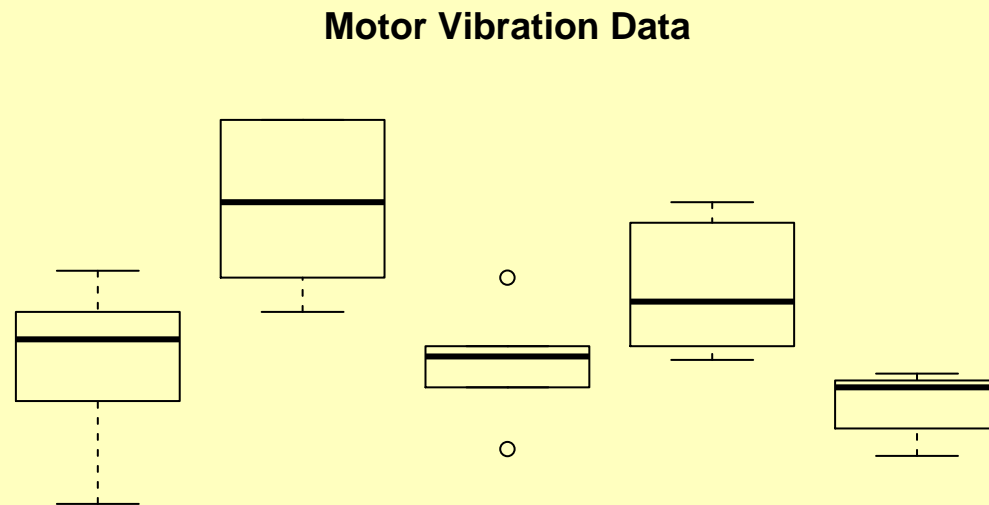
The Effects of Different Bearings

Add a Subtitle to the Top of the Plot

```
boxplot(motor, ylab="Vibration")
title(main="Motor Vibration Data")
mtext("The Effects of Different Bearings",
    side=3, line=0)
```
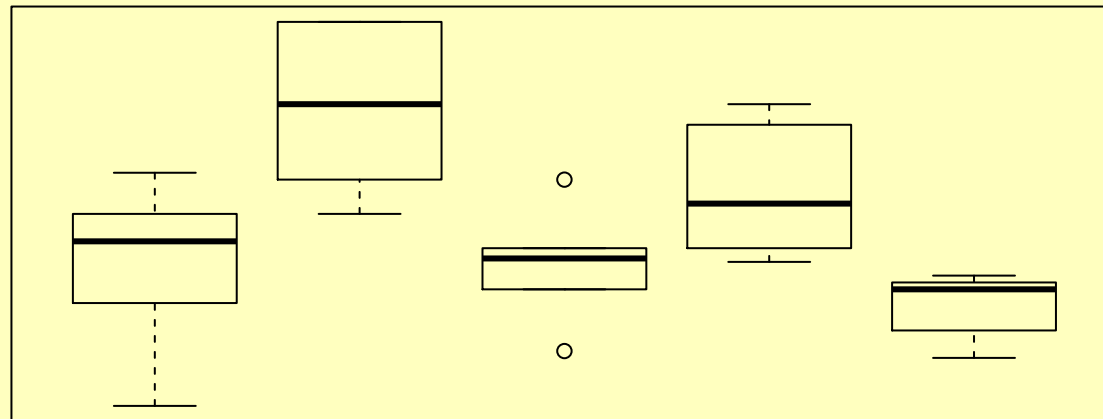
```
boxplot(motor,  axes=FALSE)
title("Motor Vibration Data")
```

Motor Vibration Data

```
boxplot(motor, axes=FALSE)
title("Motor Vibration Data")
box()
```
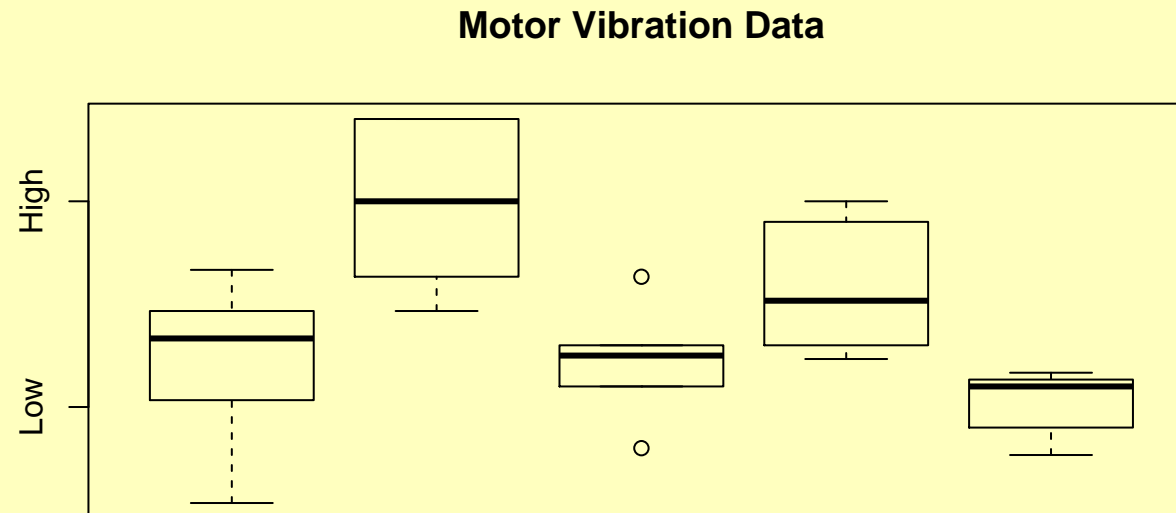
Motor Vibration Data

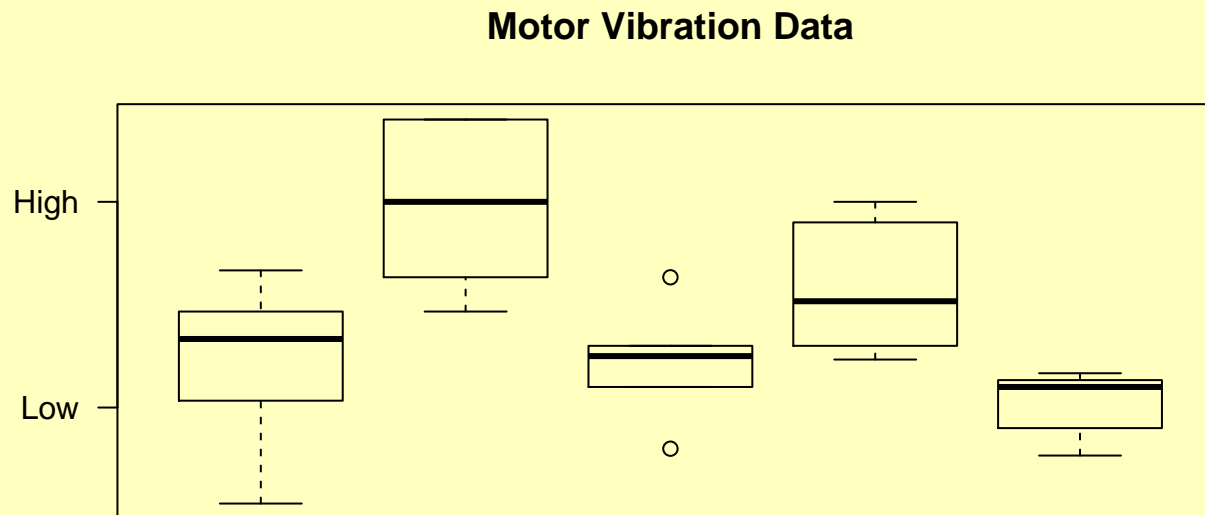# And maybe some values along the Y-Axis

... but where I want them ...

```r
boxplot(motor,  axes=FALSE)
title("Motor Vibration Data")
box()
axis(side=2, at=c(13, 16), label=c("Low", "High"))
```


Motor Vibration Data
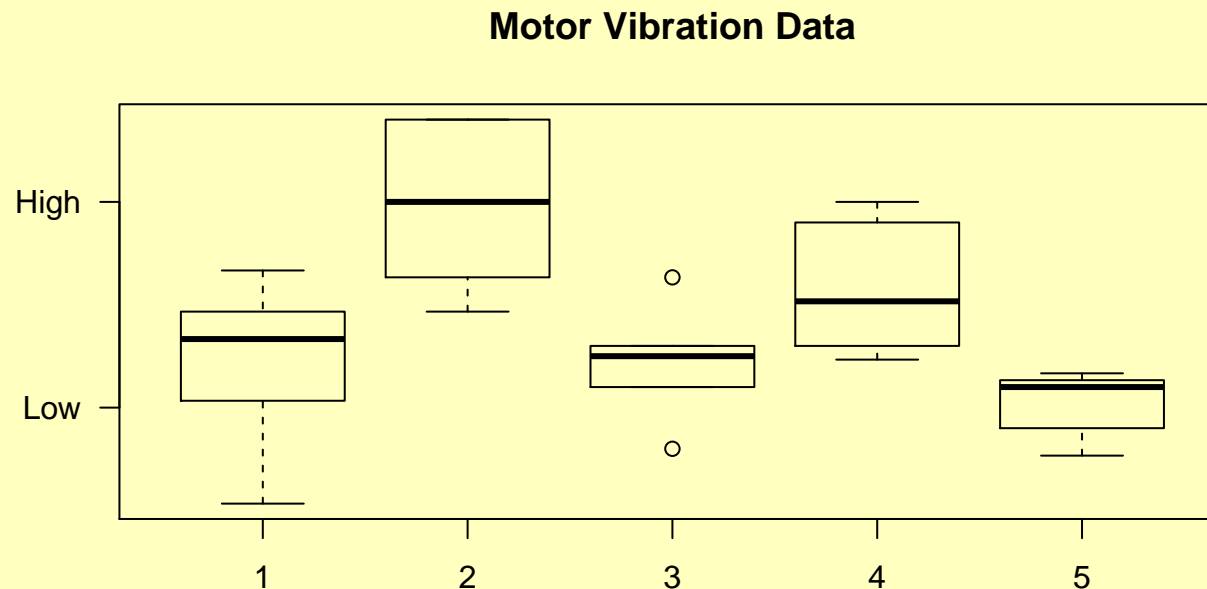
... with readable labels

... I don't want to strain my neck reading this

```
boxplot(motor,  axes=FALSE)
title("Motor Vibration Data")
box()
axis(side=2, at=c(13, 16),
    label=c("Low", "High"), las=2)
```

Motor Vibration Data

```
boxplot(motor,  axes=FALSE)
title("Motor Vibration Data")
box()
axis(side=2, at=c(13, 16),
    label=c("Low", "High"), las=2)
axis(side=1)
```

Motor Vibration Data

And the X Axis with *Useful* Labels

```r
boxplot(motor,  axes=FALSE)
title("Motor Vibration Data")
box()
axis(side=2, at=c(13, 16), label=c("Low", "High"), las=2)
axis(side=1, at=1:5, label=names(motor))
```


Motor Vibration Data