MATH 3080 Lab Project 4

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Remember: I expect to see commentary either in the text, in the code with comments created using `#`*, or (preferably) both!* ***Failing to do so may result in lost points!***

Problem 1 (11.4)

The data set `carsafety` *(**UsingR**) contains car-crash data. For several makes of car the number of drivers killed per million is recorded in 'Drivers.deaths'. The number of drivers of other cars killed in accidents with these cars, per million, is recorded in 'Other.deaths'. The variable 'type' is a factor indicating the type of car.*

(a) Perform a one-way ANOVA of the model Driver.deaths~type. Is there a difference in population means? Did you assume equal variances? Normally distributed populations?

(b) Repeat with an ANOVA model of Other.deaths~type. Is there a difference in population means?

```
library(UsingR)
```

```
## Loading required package: MASS
```

```
## Loading required package: HistData
```

```
## Loading required package: Hmisc
```

```
## Loading required package: lattice
```

```
## Loading required package: survival
```

```
## Loading required package: Formula
```

```
## Loading required package: ggplot2
```

```
##
## Attaching package: 'Hmisc'
```

```
## The following objects are masked from 'package:base':
##
##     format.pval, round.POSIXt, trunc.POSIXt, units
```

```
##
## Attaching package: 'UsingR'
```

```
## The following object is masked from 'package:survival':
##
##     cancer
```

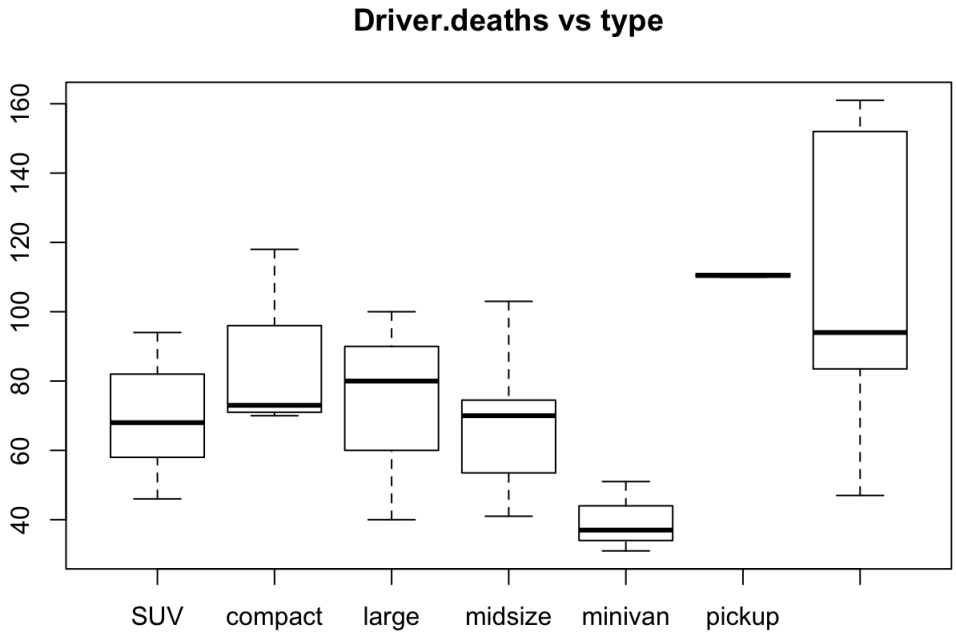
```
attach(carsafety)
data("carsafety")

oneway.test(Driver.deaths ~ type, data = carsafety, var.equal = T)
```

```
##
##  One-way analysis of means
##
## data:  Driver.deaths and type
## F = 3.3463, num df = 6, denom df = 26, p-value = 0.01407
```

```
res1 = aov(Driver.deaths ~ type, data = carsafety)
summary(res1)
```

```
##             Df Sum Sq Mean Sq F value Pr(>F)
## type         6  15295  2549.2   3.346 0.0141 *
## Residuals   26  19807   761.8
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
```

```
boxplot(Driver.deaths ~ type, y = "number of deaths", main = "Driver.deaths vs type")
```



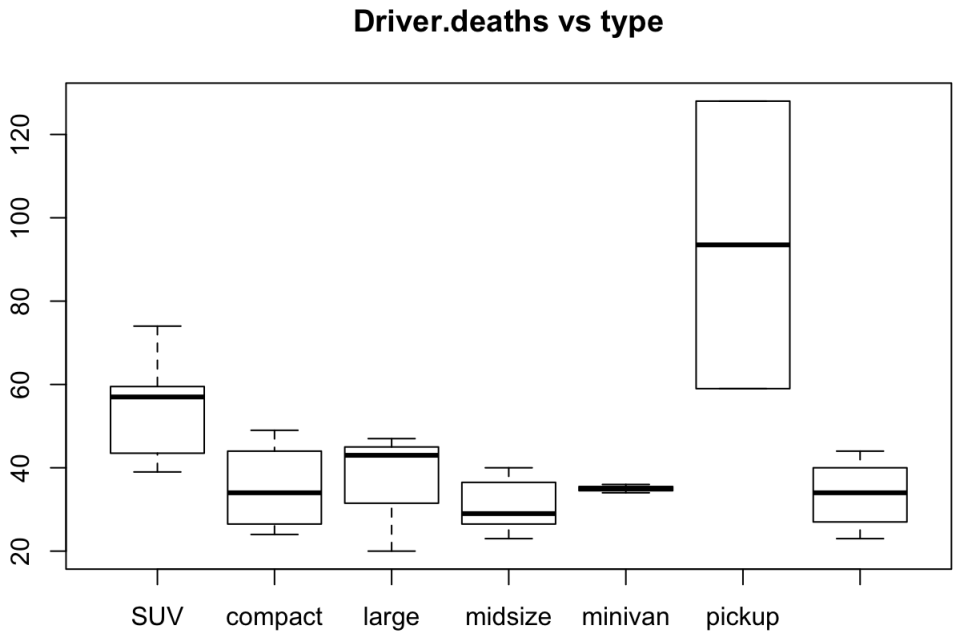

```
# no the p-value<a=0.05, so we can not reject Ho. So there is no difference
# in population means. its normally distributed populations


oneway.test(Other.deaths ~ type, data = carsafety, var.equal = T)
```

```
##
##  One-way analysis of means
##
## data:  Other.deaths and type
## F = 7.2887, num df = 6, denom df = 26, p-value = 0.000121
```

```
res2 = aov(Other.deaths ~ type, data = carsafety)
summary(res2)
```

```
##             Df Sum Sq Mean Sq F value   Pr(>F)
## type         6   7996  1332.7   7.289 0.000121 ***
## Residuals   26   4754   182.8
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
```

```
boxplot(Other.deaths ~ type, y = "number of deaths", main = "Driver.deaths vs type")
```




```
# no the p-value<a=0.05, so we can not reject Ho.

detach(carsafety)
```