Multiple Regression

```
##Simulation1
library(ggplot2)
data <-read.csv("C://Users//Cahil//PycharmProjects//ThesisNetwork//DataSets//Sim1Results4effectedlowerhi
ao7 <- aov(Mortality~A+B,data = data)
summary(ao7)
```

```
##               Df Sum Sq Mean Sq F value Pr(>F)
## A              1      9    8.66   0.095  0.758
## B              1     37   37.29   0.408  0.523
## Residuals   8997 822781   91.45
```

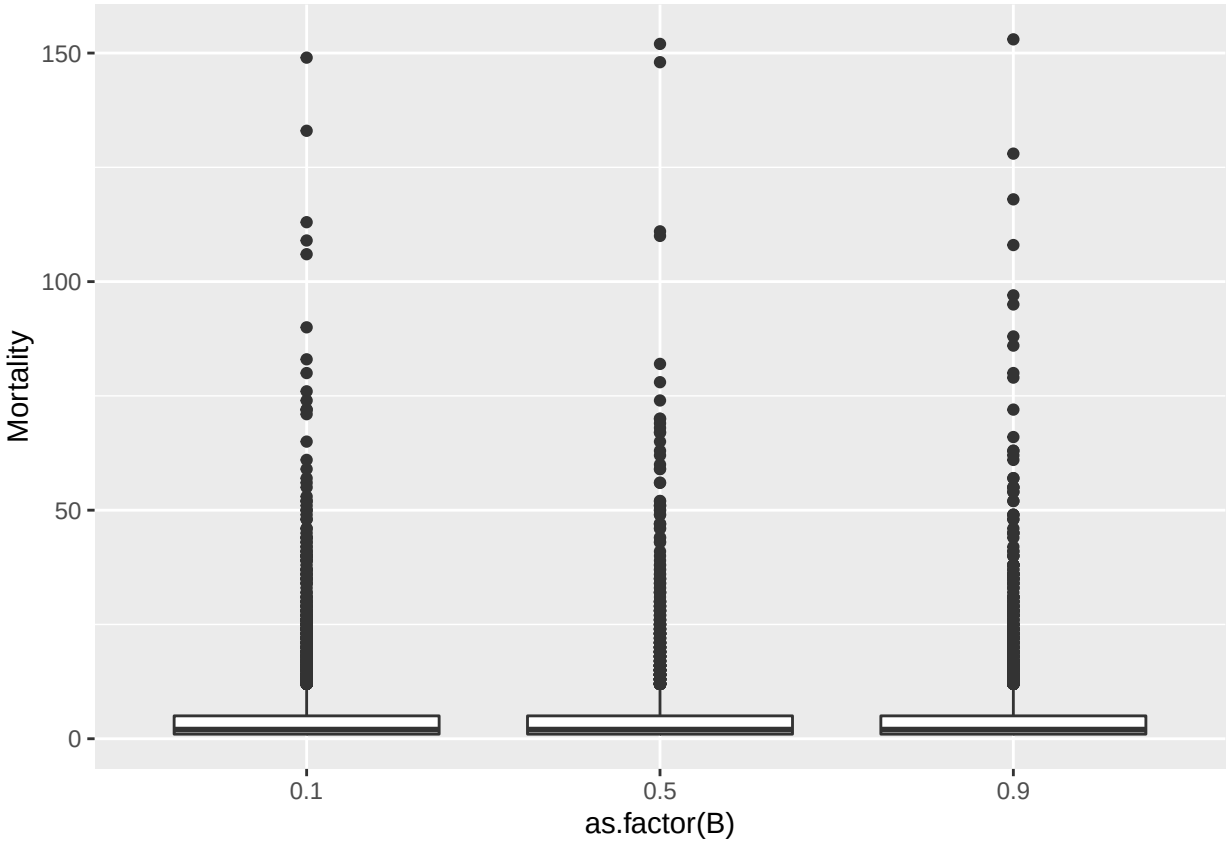
```
dataA <-subset(data, B == 0.5)
ao8 <- aov(Mortality~A,data = dataA)
summary(ao8)
```

```
##               Df Sum Sq Mean Sq F value Pr(>F)
## A              1      5    4.61   0.052  0.819
## Residuals   2998 264175   88.12
```

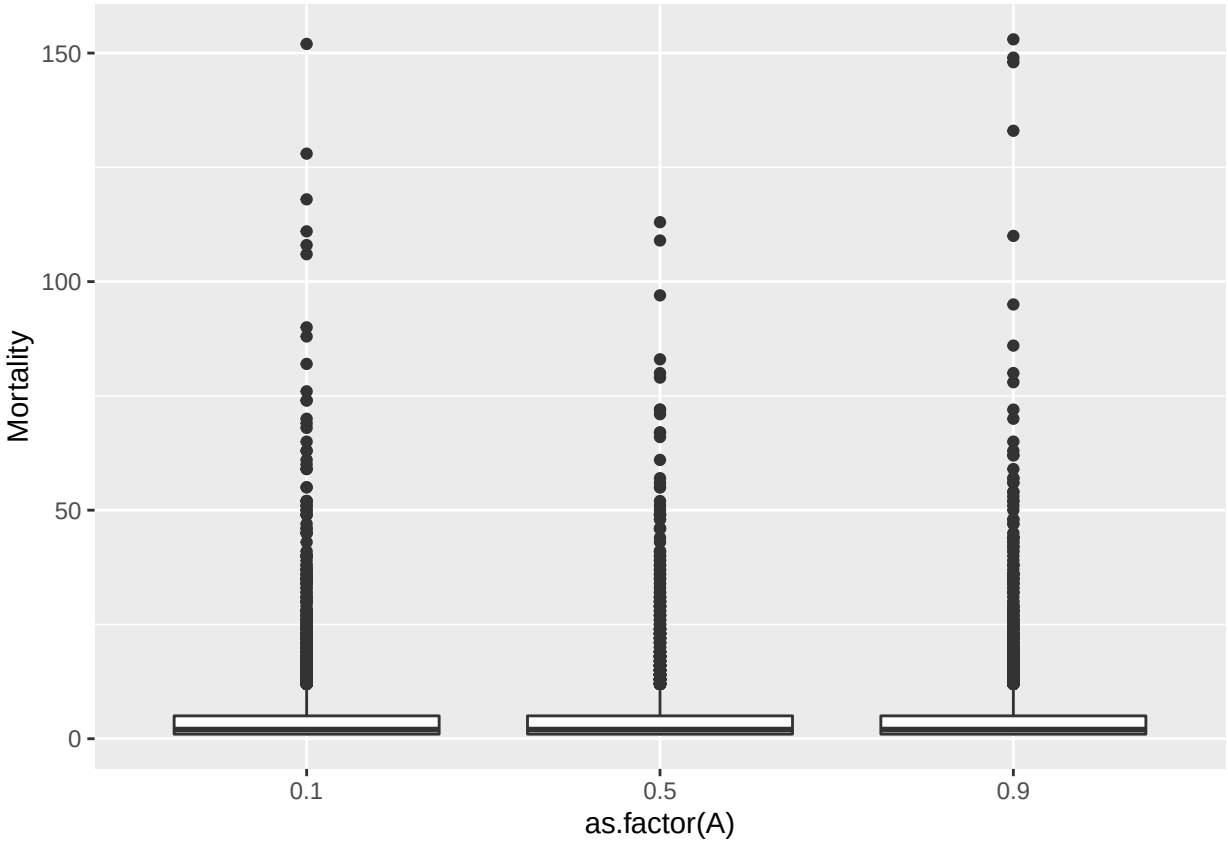
```
dataB <- subset(data, A == 0.1)
ao9 <- aov(Mortality~B,data = dataB)
summary(ao9)
```

```
##               Df Sum Sq Mean Sq F value Pr(>F)
## B              1      6    6.27   0.063  0.802
## Residuals   2998 298862   99.69
```

```
ggplot(data = data, aes(x=as.factor(B), y=Mortality)) +
  geom_boxplot()
```

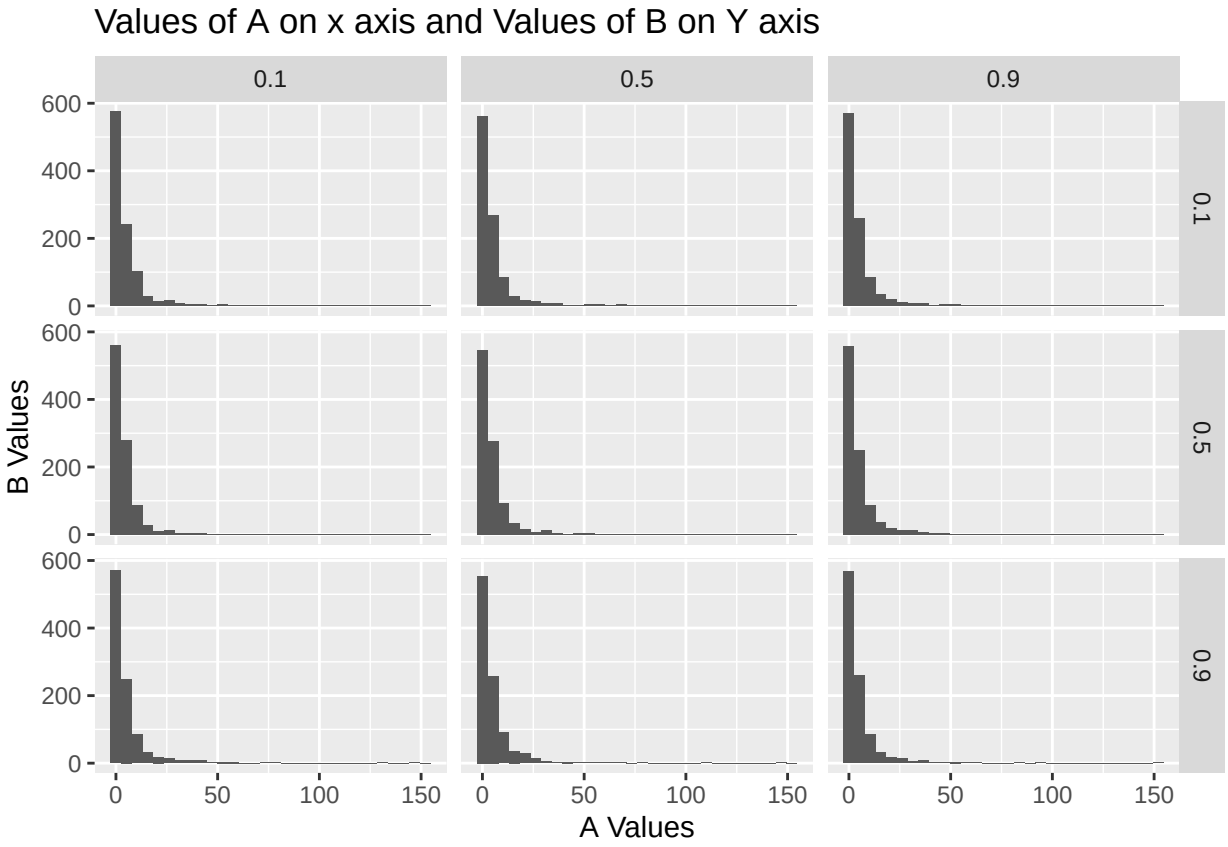



```
ggplot(data = data, aes(x=as.factor(A), y=Mortality)) +
  geom_boxplot()
```




```
ggplot(data = data, aes(x=Mortality)) +
  geom_histogram()+facet_grid(vars(A),vars(B))+xlab("A Values")+ylab("B Values")+ggtitle("Values of A o
```

```
## `stat_bin()` using `bins = 30`. Pick better value with `binwidth`.
```




```
a <- subset(data, A==0.1 & B ==0.5)
a2 <- subset(data, A==0.5 & B ==0.5)
a3 <- subset(data, A==0.9 & B ==0.5)
b3 <- subset(data, B==0.9 & A == 0.1)
b2 <- subset(data, B==0.5 & A == 0.1)
b <- subset(data, B==0.1 & A == 0.1)
mean(a$Mortality)
```

```
## [1] 5.381
```

```
mean(a2$Mortality)
```

```
## [1] 4.989
```

```
mean(a3$Mortality)
```

```
## [1] 5.285
```

```
mean(b$Mortality)
```

```
## [1] 5.166
```

```r
mean(b2$Mortality)
```

```
## [1] 5.381
```

```r
mean(b3$Mortality)
```

```
## [1] 5.278
```

```r
#Simulation 2
data <-read.csv("C://Users//Cahil//PycharmProjects//ThesisNetwork//DataSets//Sim1Results42.csv",header =
ao1 <- aov(Mortality~A+B,data = data)
summary(ao1)
```

```
##               Df    Sum Sq Mean Sq F value Pr(>F)
## A              1 2.246e+06 2245684   2.277  0.131
## B              1 5.883e+03    5883   0.006  0.938
## Residuals   8997 8.872e+09  986114
```

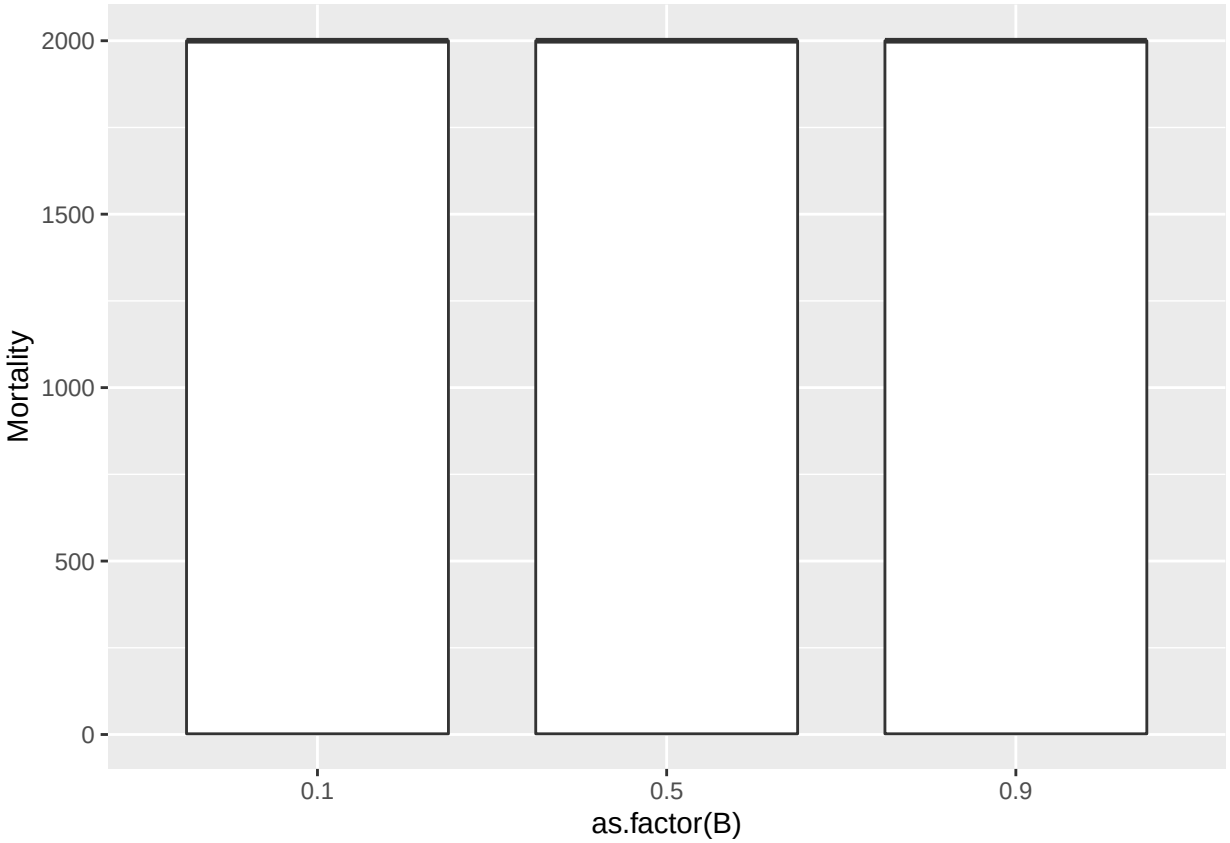
```r
dataA <-subset(data, B == 0.5)
ao2 <- aov(Mortality~A,data = dataA)
summary(ao2)
```

```
##               Df    Sum Sq Mean Sq F value Pr(>F)
## A              1 1.928e+06 1928143   1.964  0.161
## Residuals   2998 2.943e+09  981777
```

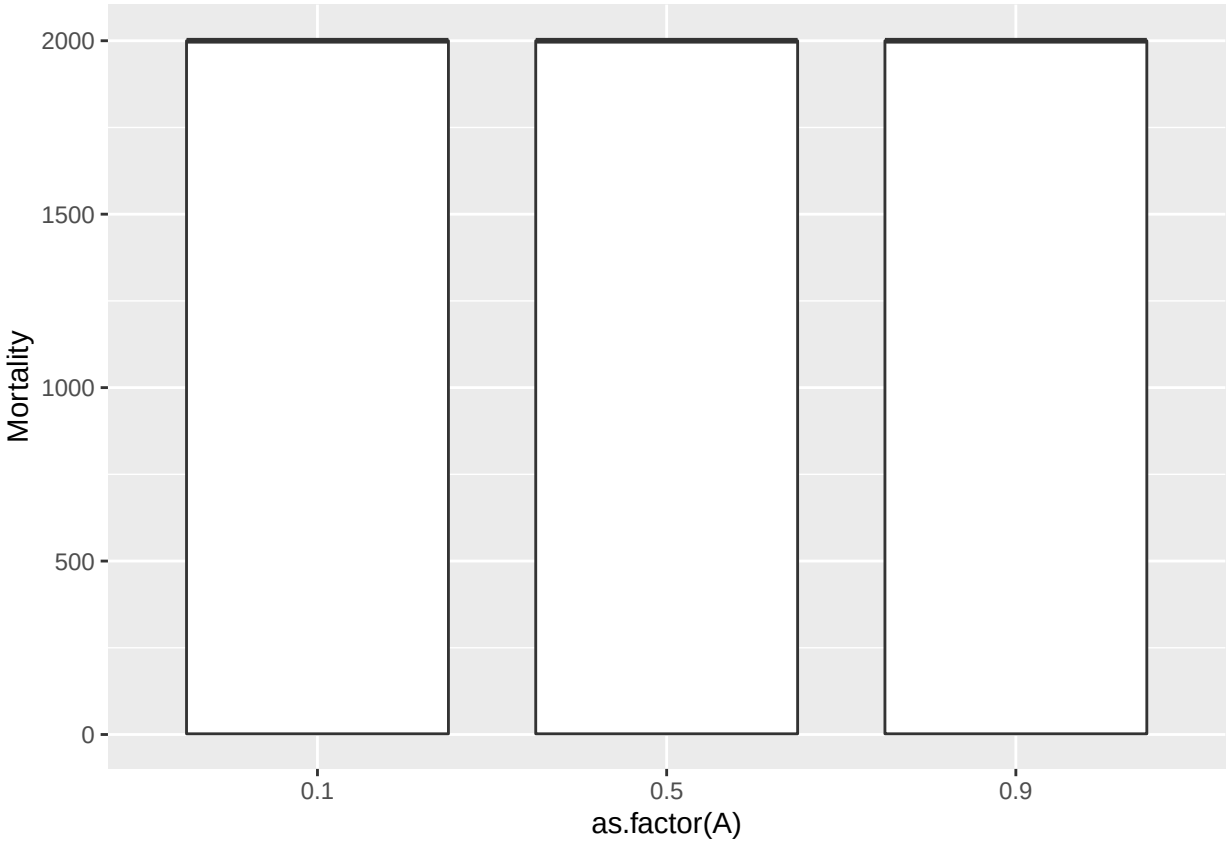
```r
dataB <- subset(data, A == 0.1)
ao3 <- aov(Mortality~B,data = dataB)
summary(ao3)
```

```
##               Df    Sum Sq Mean Sq F value Pr(>F)
## B              1 1.562e+06 1561958   1.592  0.207
## Residuals   2998 2.941e+09  980987
```

```r
ggplot(data = data, aes(x=as.factor(B), y=Mortality)) +
  geom_boxplot()
```

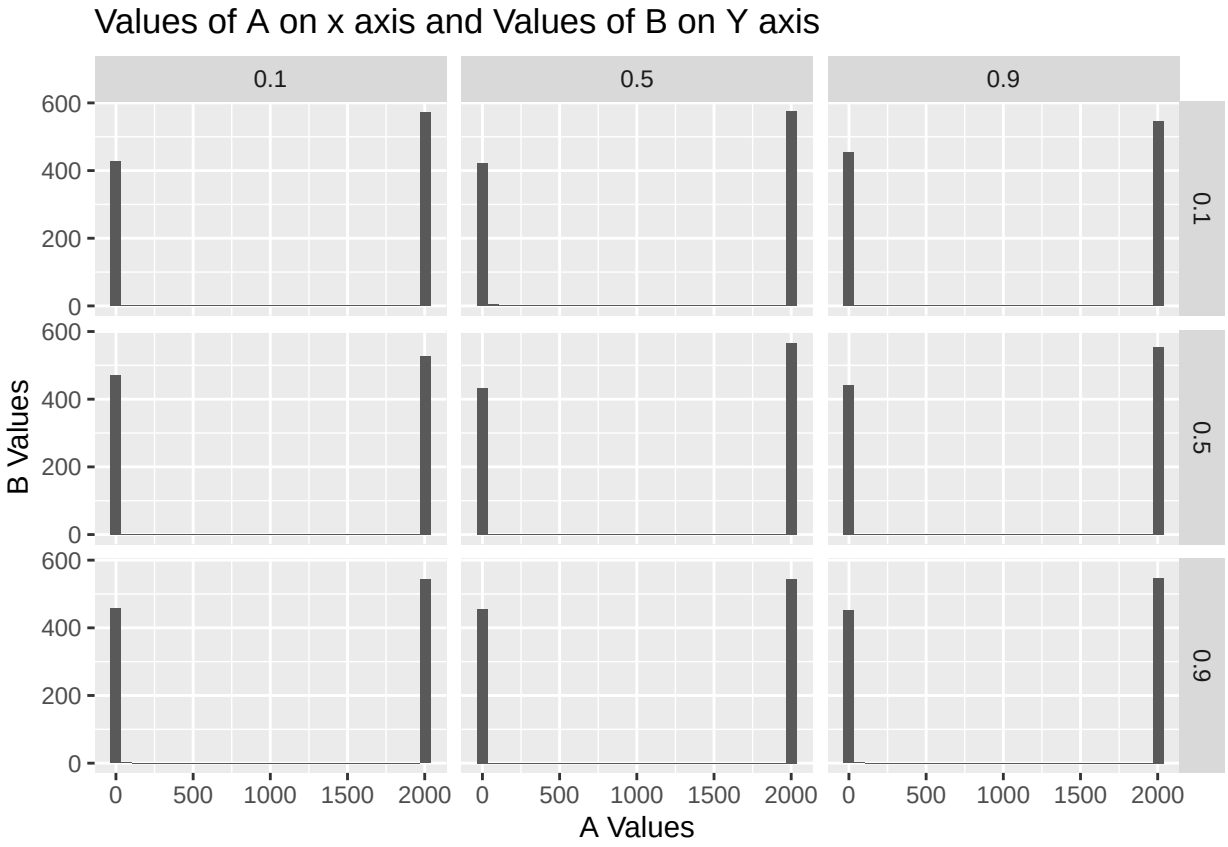



```
ggplot(data = data, aes(x=as.factor(A), y=Mortality)) +
  geom_boxplot()
```




```
ggplot(data = data, aes(x=Mortality)) +
  geom_histogram()+facet_grid(vars(A),vars(B))+xlab("A Values")+ylab("B Values")+ggtitle("Values of A o
```

```
## `stat_bin()` using `bins = 30`. Pick better value with `binwidth`.
```




```
a <- subset(data, A==0.1 & B ==0.5)
a2 <- subset(data, A==0.5 & B ==0.5)
a3 <- subset(data, A==0.9 & B ==0.5)
b3 <- subset(data, B==0.9 & A == 0.1)
b2 <- subset(data, B==0.5 & A == 0.1)
b <- subset(data, B==0.1 & A == 0.1)
mean(a$Mortality)
```

```
## [1] 1151.877
```

```
mean(a2$Mortality)
```

```
## [1] 1135.745
```

```
mean(a3$Mortality)
```

```
## [1] 1089.778
```

```
mean(b$Mortality)
```

```
## [1] 1145.741
```

```r
mean(b2$Mortality)
```

```
## [1] 1151.877
```

```r
mean(b3$Mortality)
```

```
## [1] 1089.849
```

```r
#Simulation 2
data <-read.csv("C://Users//Cahil//PycharmProjects//ThesisNetwork//DataSets//Sim1Results10.csv",header =
ao10 <- aov(NumAffected~A+B,data = data)
summary(ao10)
```

```
##                Df    Sum Sq Mean Sq F value Pr(>F)
## A               1 2.129e+06 2128909   1.205  0.272
## B               1 9.576e+05  957582   0.542  0.462
## Residuals    4497 7.943e+09 1766285
```

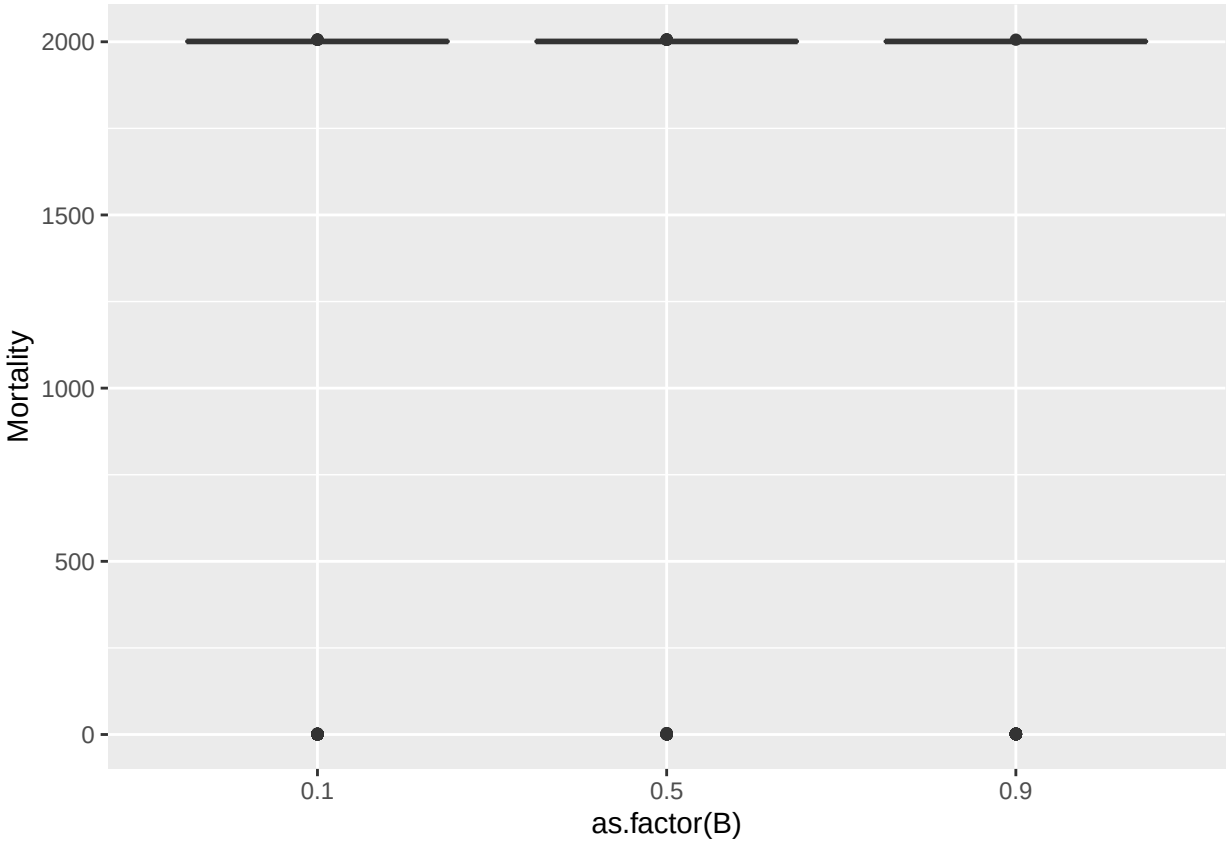
```r
dataA <-subset(data, B == 0.5)
ao11 <- aov(NumAffected~A,data = dataA)
summary(ao11)
```

```
##                Df    Sum Sq Mean Sq F value Pr(>F)
## A               1 7.845e+05  784504   0.468  0.494
## Residuals    1498 2.511e+09 1676338
```

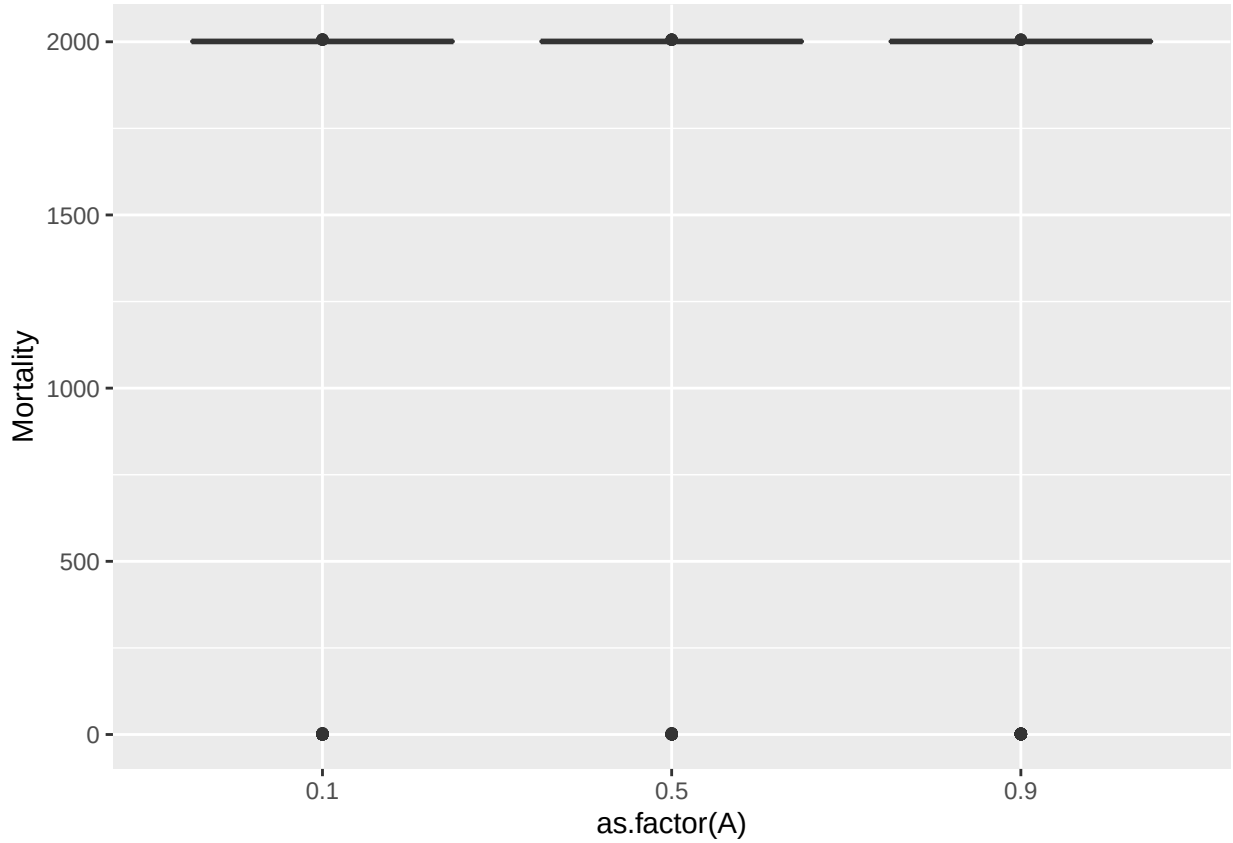
```r
dataB <- subset(data, A == 0.1)
ao12 <- aov(NumAffected~B,data = dataB)
summary(ao12)
```

```
##                Df    Sum Sq Mean Sq F value Pr(>F)
## B               1 4.844e+06 4844160   2.436  0.119
## Residuals    1498 2.978e+09 1988182
```

```r
ggplot(data = data, aes(x=as.factor(B), y=Mortality)) +
  geom_boxplot()
```

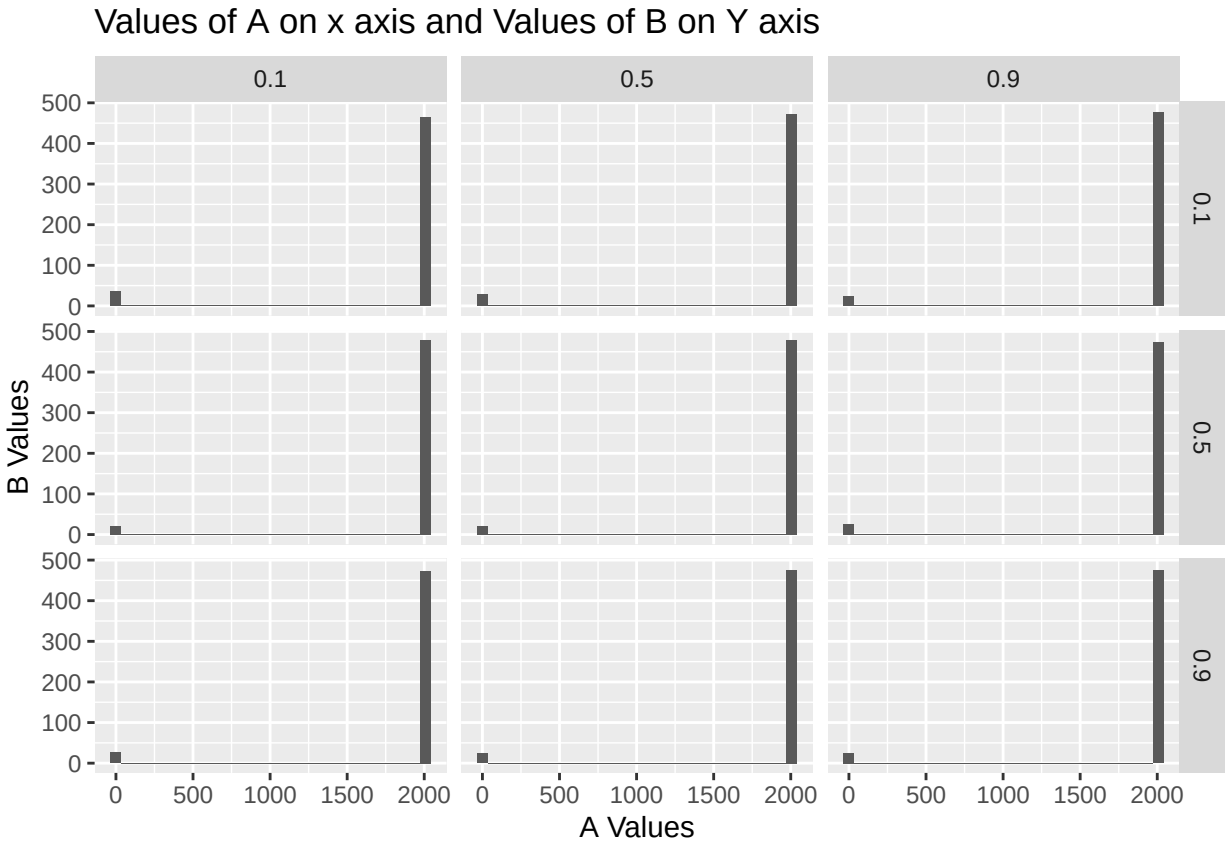



```
ggplot(data = data, aes(x=as.factor(A), y=Mortality)) +
  geom_boxplot()
```




```
ggplot(data = data, aes(x=Mortality)) +
  geom_histogram()+facet_grid(vars(A),vars(B))+xlab("A Values")+ylab("B Values")+ggtitle("Values of A o
```

```
## `stat_bin()` using `bins = 30`. Pick better value with `binwidth`.
```




```
a <- subset(data, A==0.1 & B ==0.5)
a2 <- subset(data, A==0.5 & B ==0.5)
a3 <- subset(data, A==0.9 & B ==0.5)
b3 <- subset(data, B==0.9 & A == 0.1)
b2 <- subset(data, B==0.5 & A == 0.1)
b <- subset(data, B==0.1 & A == 0.1)
mean(a$NumAffected)
```

```
## [1] 5619.13
```

```
mean(a2$NumAffected)
```

```
## [1] 5718.228
```

```
mean(a3$NumAffected)
```

```
## [1] 5675.148
```

```
mean(b$NumAffected)
```

```
## [1] 5532.49
```

```r
mean(b2$NumAffected)
```

```
## [1] 5619.13
```

```r
mean(b3$NumAffected)
```

```
## [1] 5671.69
```

```r
mean(a$Mortality)
```

```
## [1] 1885.206
```

```r
mean(a2$Mortality)
```

```
## [1] 1917.194
```

```r
mean(a3$Mortality)
```

```
## [1] 1905.266
```

```r
mean(b$Mortality)
```

```
## [1] 1857.174
```

```r
mean(b2$Mortality)
```

```
## [1] 1885.206
```

```r
mean(b3$Mortality)
```

```
## [1] 1905.256
```