CourseProject VitaC and ToothGrowth

INTRODUCTION

On Vitamin C and ToothGrowth For the 2nd part of the project, we are assigned to investigate the ToothGrowth dataset provided in R. As a brief background of the dataset, the data was drawn from a study regarding the effect of vitamin C. The length of odontoblasts in 60 guinea pigs were recorded after treatment of varying vitamin C dosage. Dosages (ranging from 0.5 to 2mg/day) were also delivered by two methods, via orange juice or ascorbic acid.

DATA OVERVIEW

```
##
## 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
```

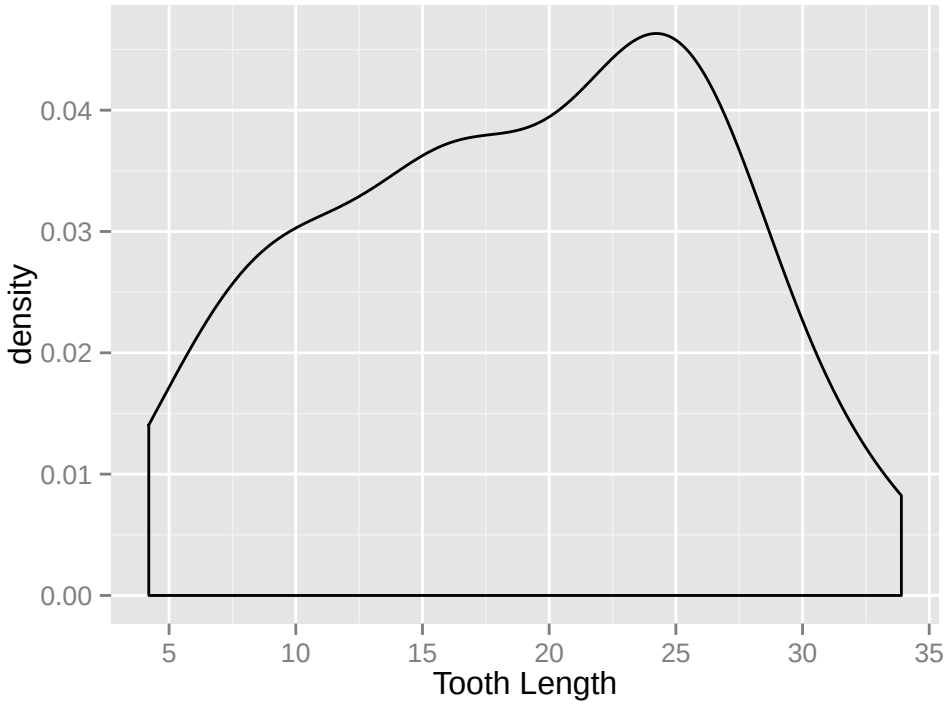
```
## 'data.frame':    60 obs. of  3 variables:
##  $ len : num  4.2 11.5 7.3 5.8 6.4 10 11.2 11.2 5.2 7 ...
##  $ supp: Factor w/ 2 levels "OJ","VC": 2 2 2 2 2 2 2 2 2 2 ...
##  $ dose: num  0.5 0.5 0.5 0.5 0.5 0.5 0.5 0.5 0.5 0.5 ...
```

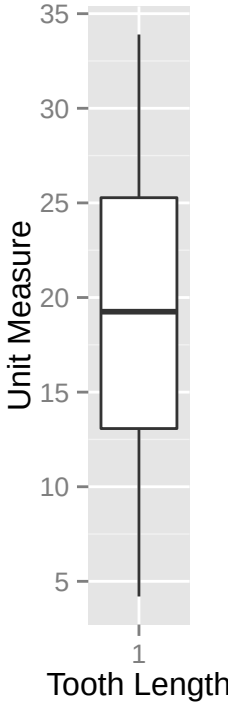
```
##    len supp dose
## 1  4.2   VC  0.5
## 2 11.5   VC  0.5
## 3  7.3   VC  0.5
## 4  5.8   VC  0.5
## 5  6.4   VC  0.5
```

```
##     len supp dose
## 56 30.9   OJ    2
## 57 26.4   OJ    2
## 58 27.3   OJ    2
## 59 29.4   OJ    2
## 60 23.0   OJ    2
```

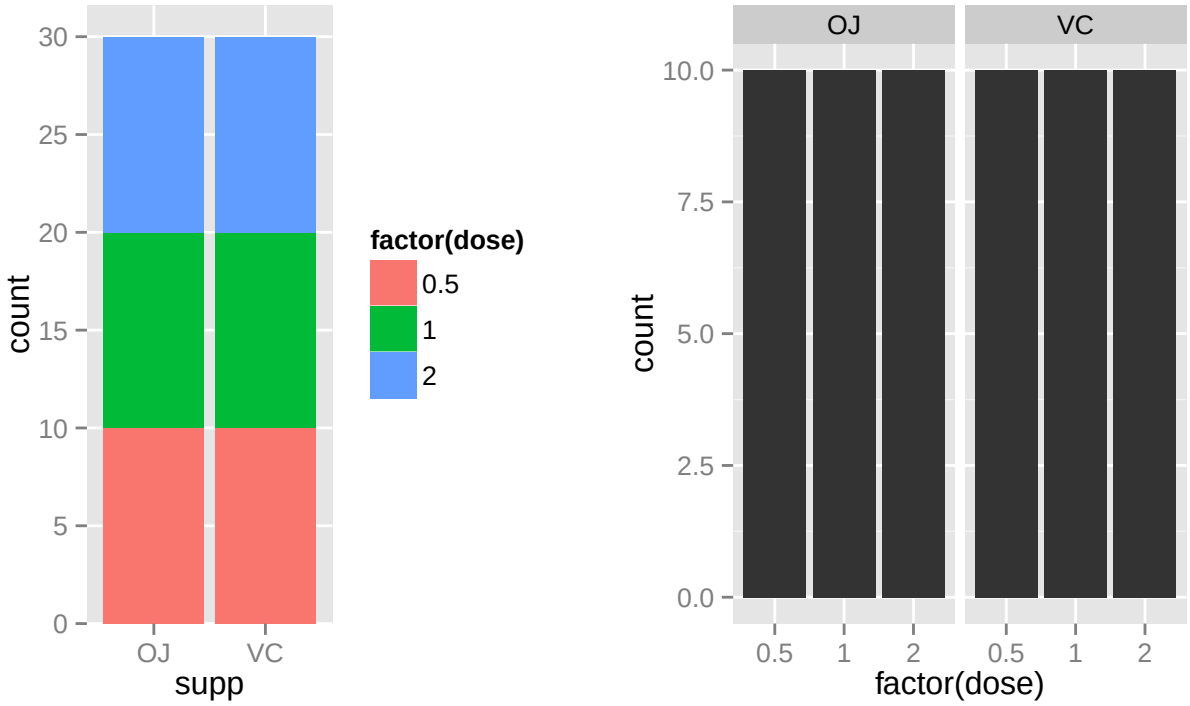
EXPLORATORY AND DATA SUMMARY – Univariate

```
##    Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
##    4.20   13.08   19.25   18.81   25.28   33.90
```



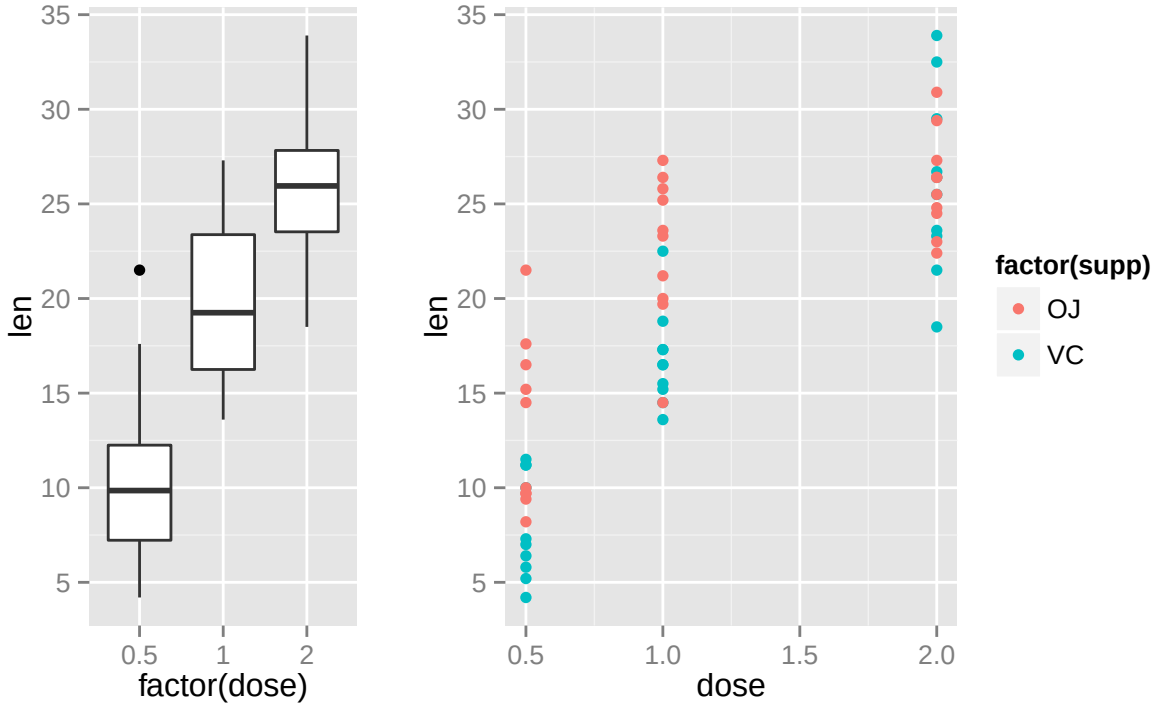



```
##    Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
##    4.20   13.08   19.25   18.81   25.28   33.90
```

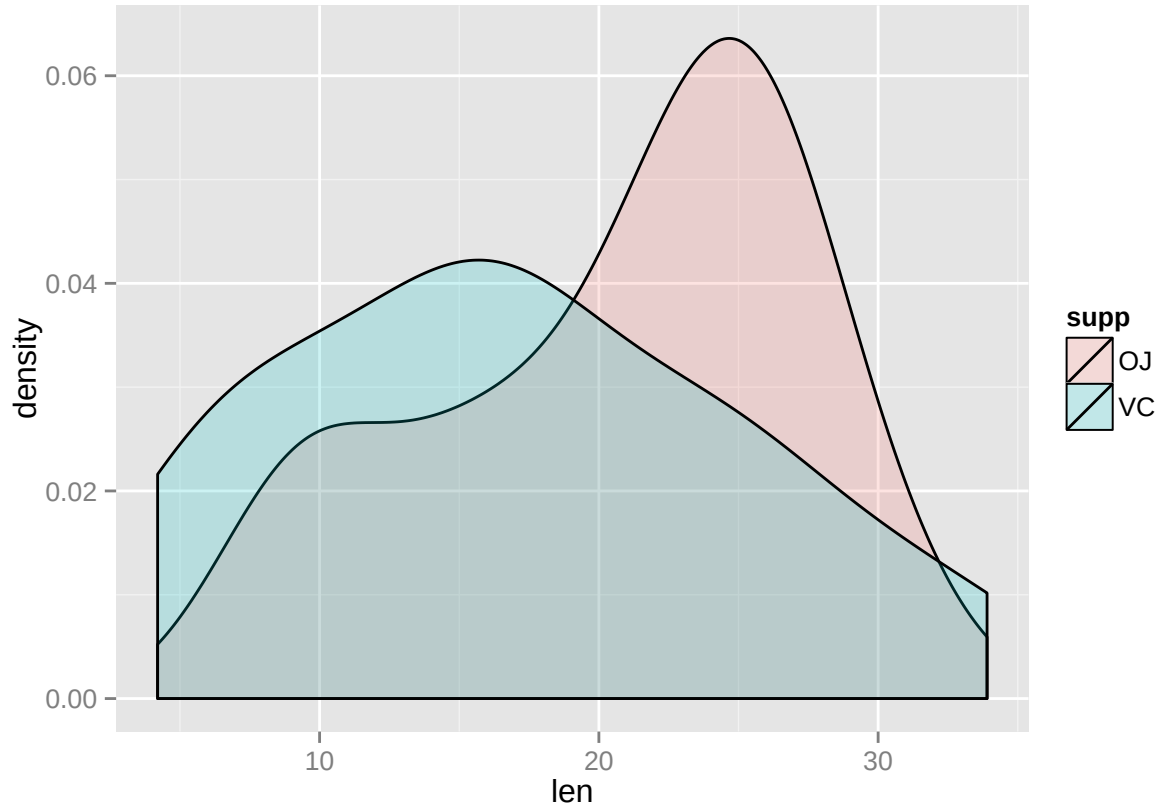


From this graphic, we are able to pull additional information regarding the study. Of the 60 guinea pigs, 30 each are assigned to each delivery method (left graphic). Of each delivery method, 10 of each are assigned to the three dosage categories (0.5, 1 and 2)

EXPLORATORY AND DATA SUMMARY – Bivariate


35
30
25
20
15
10
5
len
0.5
1
2
factor(dose)
35
30
25
20
15
10
5
len
0.5
1.0
1.5
2.0
dose
factor(supp)
OJ
VC

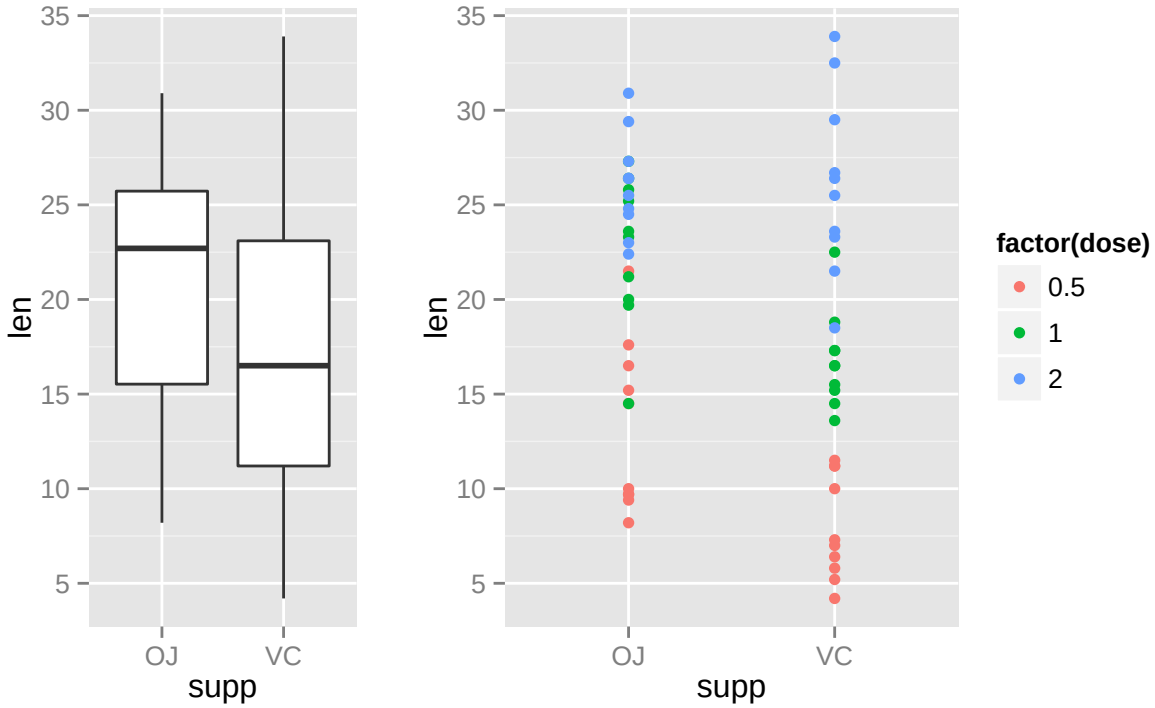
Dosage

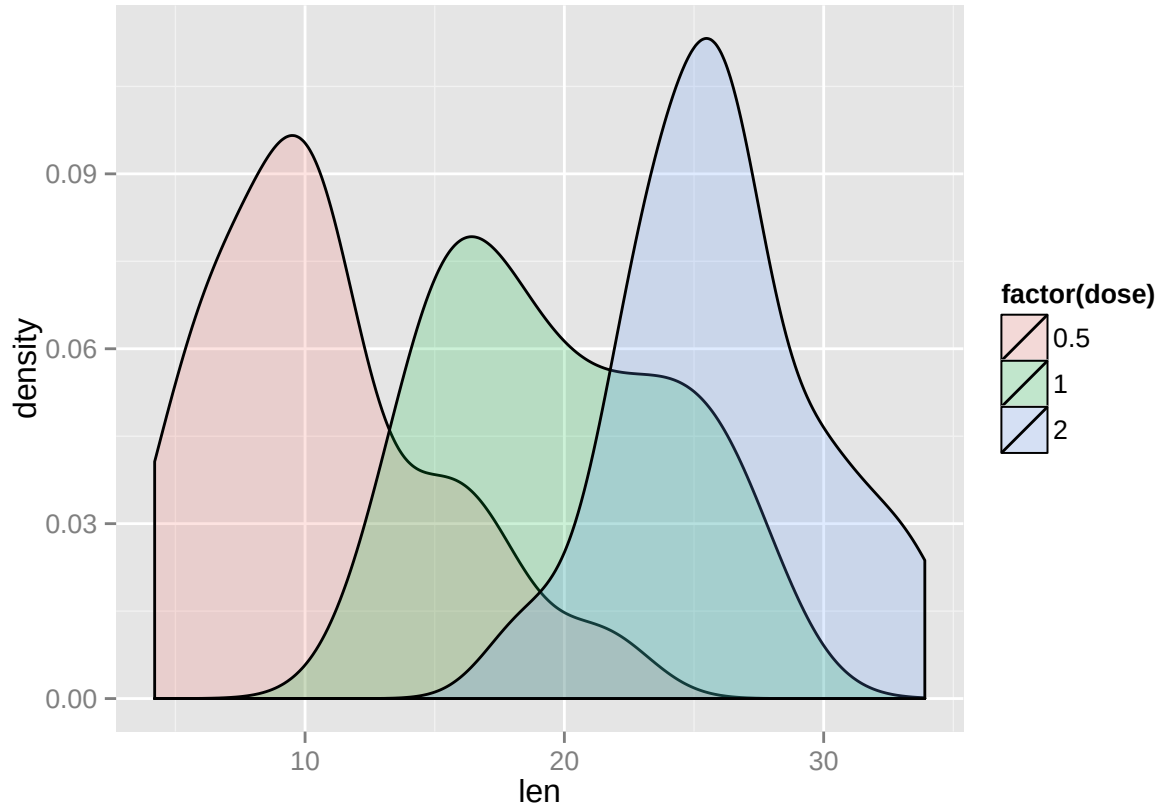


Visually comparing the medians, we can observe that guinea pigs that recieved higher dosage (1-2mmg) tend to have higher tooth length compared to those that only have 0.5mmg dosage. Further, when adding delivery method represented by color (left graph), we see that for 0.5 and 1.0 dosage, guinea pigs tended to have higher tooth length.

```
## Source: local data frame [2 x 5]
##
##     supp     n GrpMean GrpVar GrpSD
##   (fctr) (int)   (dbl)  (dbl) (dbl)
## 1     OJ    30   20.66  43.63  6.61
## 2     VC    30   16.96  68.33  8.27
```

Supp (Delivery Method)





filler

```
## Source: local data frame [3 x 5]
##
##   factor(dose)     n GrpMean GrpVar GrpSD
##         (fctr) (int)   (dbl)  (dbl) (dbl)
## 1          0.5    20   10.61  20.25  4.50
## 2            1    20   19.73  19.50  4.42
## 3            2    20   26.10  14.24  3.77
```

STATISTICAL TESTS

CONCLUSION