Data-Analysis in R

Syed Faaris Razi

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Tooth-Growth of Guinea Pigs by Vitamin-C dosage

A study by Crampton (1947) involved observing the tooth-length of guinea pigs grouped by the daily dosage of Vitamin-C they received (0.5, 1, and 2 milligrams), with delivery methods of orange juice and ascorbic acid.

The dataset is shown below, with the factor **supp** being the Supplement type (OJ - Orange Juice, VC - Ascorbic acid), the numeric columns **len** and **dose** being tooth-length and dosage (mg) respectively.

```
library(tidyverse)

tibble(ToothGrowth)
```

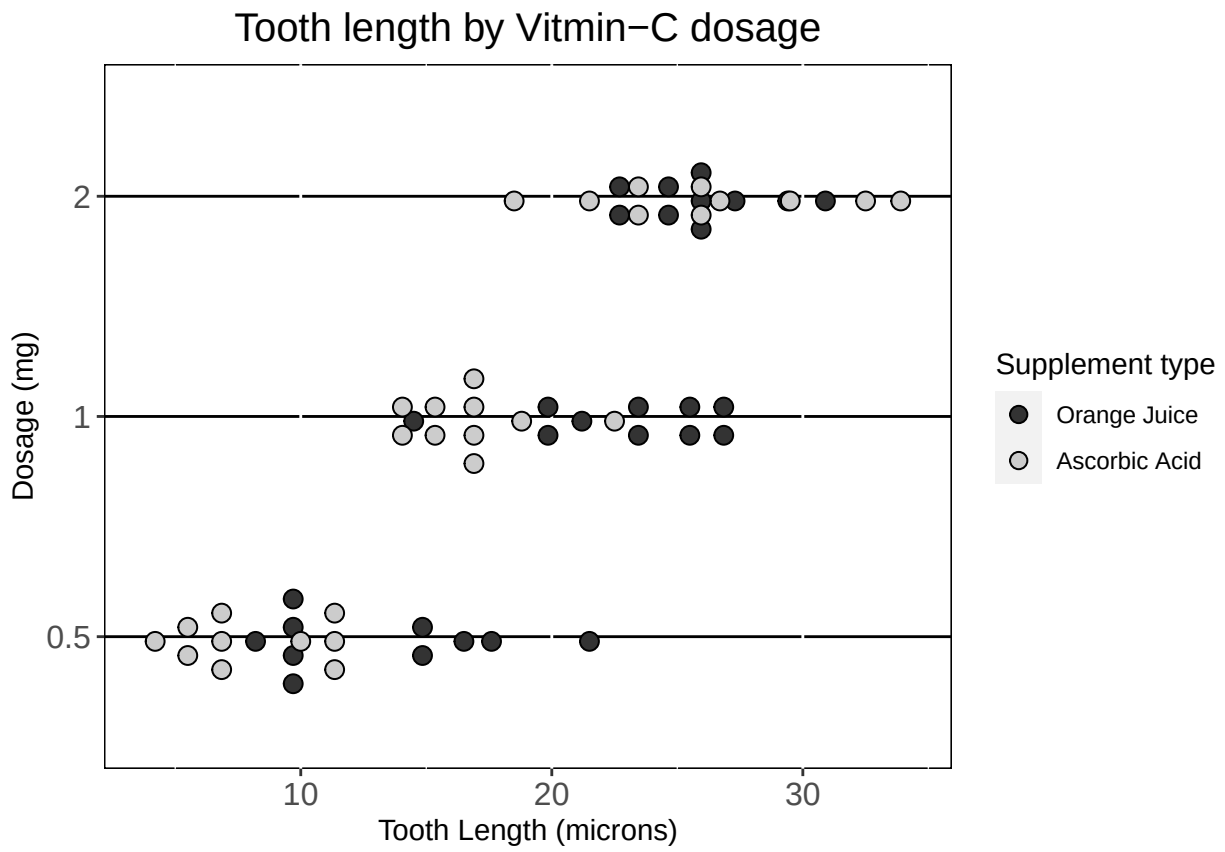
```
## # A tibble: 60 x 3
##      len supp   dose
##    <dbl> <fct> <dbl>
##  1   4.2 VC      0.5
##  2  11.5 VC      0.5
##  3   7.3 VC      0.5
##  4   5.8 VC      0.5
##  5   6.4 VC      0.5
##  6  10   VC      0.5
##  7  11.2 VC      0.5
##  8  11.2 VC      0.5
##  9   5.2 VC      0.5
## 10   7   VC      0.5
## # ... with 50 more rows
```

Visualizing the Tooth-Growth data

Lets view our data as a *dot-plot*, categorized in dosage-groups with dots presenting the Supplement types:

```
ggplot(ToothGrowth, aes(x = as.factor(dose), y = len, fill = as.factor(supp))) +

  geom_dotplot(binaxis = 'y', stackratio = 1.5, stackdir = 'center', dotsize = 0.75,
binwidth = 1) +

  labs(y = "Tooth Length (microns)", x = "Dosage (mg)",
```

```
      title = "Tooth length by Vitmin-C dosage",
      fill = "Supplement type") +

coord_flip() + scale_fill_grey(labels=c('Orange Juice', 'Ascorbic Acid')) +

theme(plot.title = element_text(size = 15, hjust = 0.5), axis.text = element_text(size=12),
      panel.background = element_rect(fill = "white", colour = "black"),
      panel.grid.major.y = element_line(size = 0.5, linetype = 'solid', colour = "black"))
```



References

- Crampton E.W. (1947). The growth of the odontoblast of the incisor teeth as a criterion of vitamin C intake of the guinea pig. The Journal of Nutrition, 33(5), 491–504.