Assignment 2

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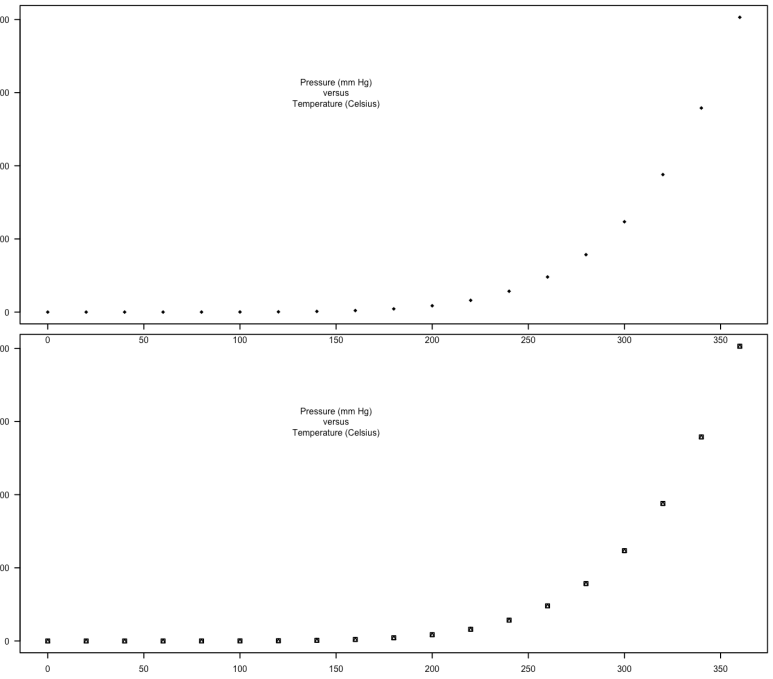
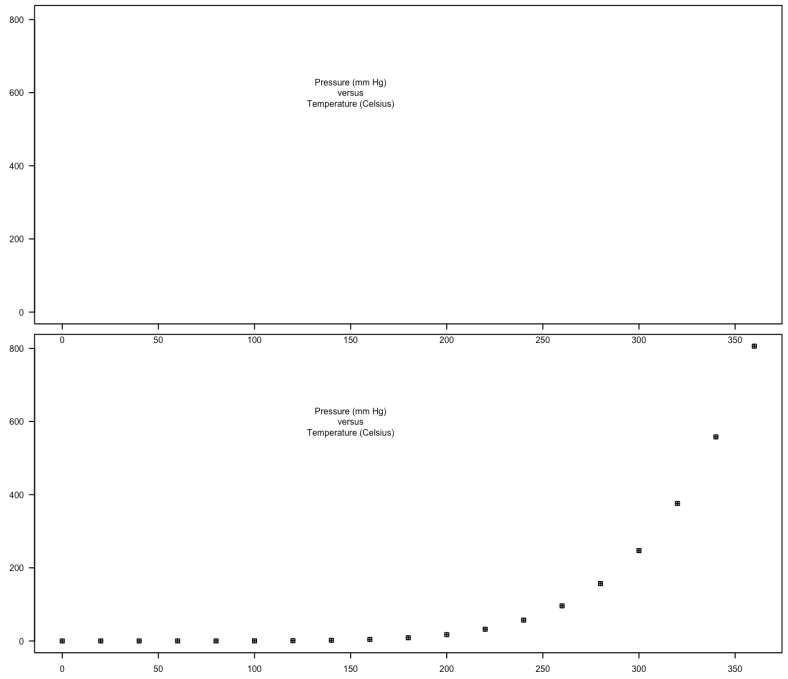
EPPS 6356 Data Visualization

Question 1

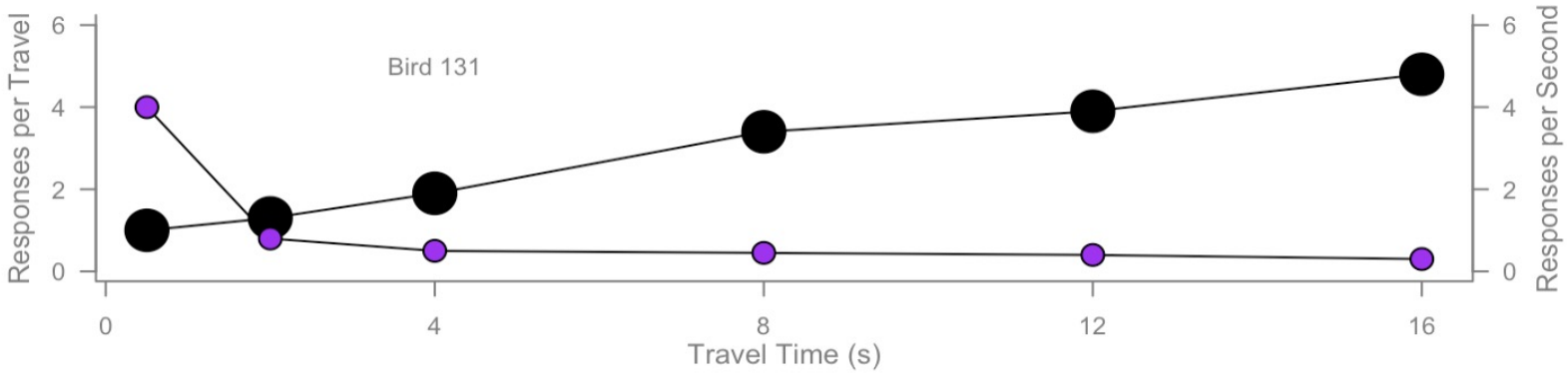
Par 12,14, 18

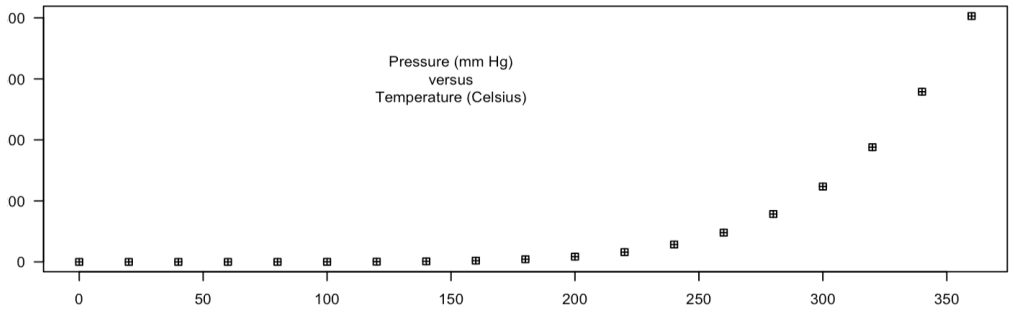




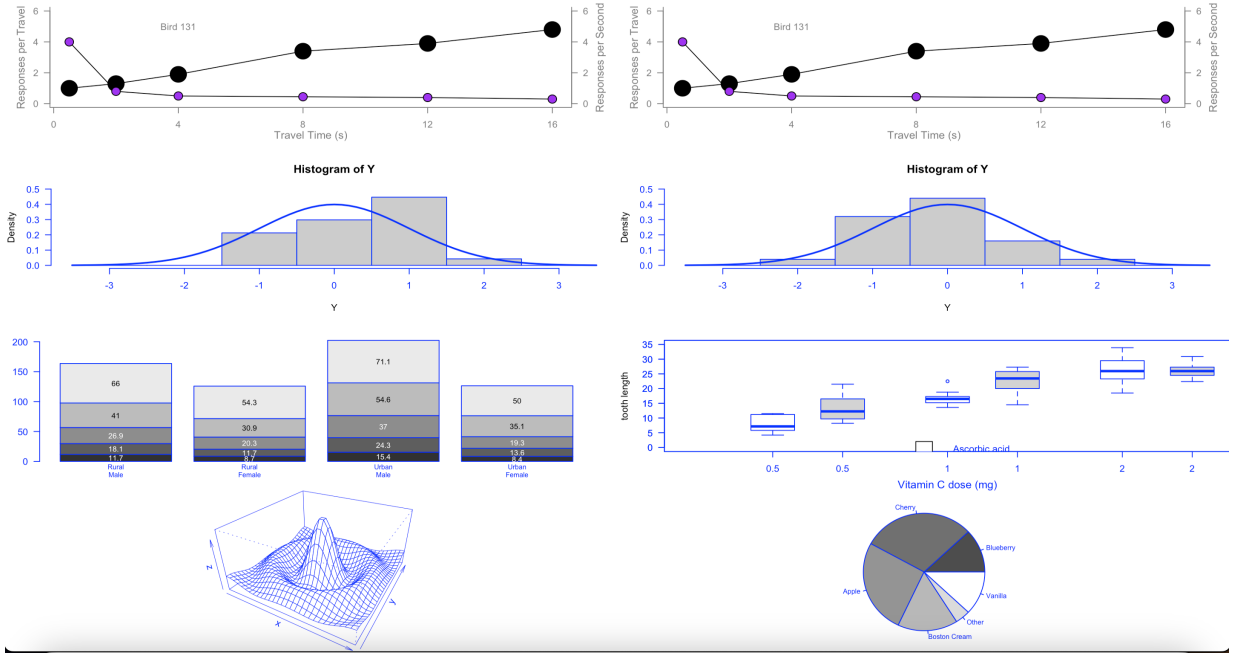
Question 2

- What is the first number standing for?
- The first number stands for the x axis → axis(1, at=seq(0, 16, 4)) #





- Changed color, par and cex for different graphs




```
23
24  # Setting label orientation, margins c(bottom, left, top, right) & text size
25  par(las=1, mar=c(4, 4, 2, 4), cex=.7)
26  plot.new()
27  plot.window(range(x), c(0, 6))
28  lines(x, y1)
29  lines(x, y2)
30  points(x, y1, pch=16, cex=4) # Try different cex value?
31  points(x, y2, pch=21, bg="purple", cex=2)  # Different background color
32  par(col="gray50", fg="gray50", col.axis="gray50")
33  axis(1, at=seq(0, 16, 4)) # What is the first number standing for?
34  axis(2, at=seq(0, 6, 2))
35  axis(4, at=seq(0, 6, 2))
36  box(bty="u")
37  mtext("Travel Time (s)", side=1, line=2, cex=0.8)
38  mtext("Responses per Travel", side=2, line=2, las=0, cex=0.8)
39  mtext("Responses per Second", side=4, line=2, las=0, cex=0.8)
40  text(4, 5, "Bird 131")
41  par(mar=c(5.1, 4.1, 4.1, 2.1), col="blue", fg="blue", col.axis="blue")
```

104:1 (Top Level) R Script

Console Background Jobs

```
R 4.2.3 · ~/DataVis.github.io/
> f <- function(x,y) { r <- sqrt(x^2+y^2); 10 * sin(r)/r }
> z <- outer(x, y, f)
> z[is.na(z)] <- 1
> # 0.5 to include z axis label
> par(mar=c(0, 0.5, 0, 0), lwd=0.5)
> persp(x, y, z, theta = 30, phi = 30,
+       expand = 0.5)
> par(mar=c(5.1, 4.1, 4.1, 2.1), lwd=1)
```

z	num [1:30, 1:30] 0.707 0.651 0.45 0.153 -0.177 ...
Values	
dn	num [1:71] 0.000873 0.001232 0.001723 0.002384 0.003267 ...
midpts	num [1:4] 0.7 1.9 3.1 4.3
pie.sales	Named num [1:6] 0.12 0.3 0.26 0.16 0.04 0.12

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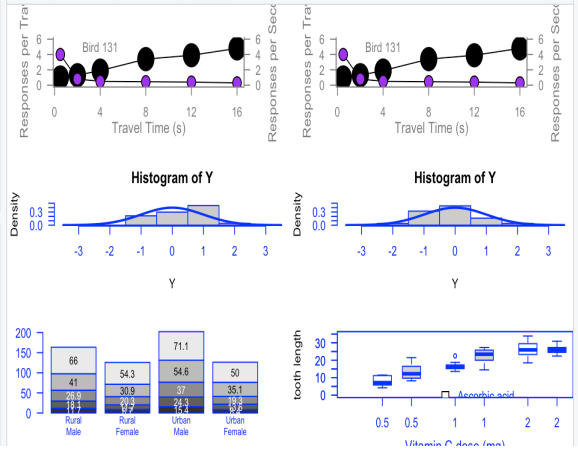

Happy Planet Index Graphs

```
#Load readxl package
library("readxl")


# Read xsl files
df = read_excel("/Users/coparaji/Downloads/happy-planet-index-2006-2020-public-data-set.xlsx")

# Histogram
# happy-planet-index-2006-2020-public-data-set.xlsx
Y <- rnorm(50)
# Make sure no Y exceed [-3.5, 3.5]
Y[Y < -3.5 | Y > 3.5] <- NA # Selection/set range
x <- seq(-3.5, 3.5, .1)
dn <- dnorm(x)
par(mar=c(4.5, 4.1, 3.1, 0))
hist(Y, breaks=seq(-3.5, 3.5), ylim=c(0, 0.5),
     col="pink2", freq=FALSE)
lines(x, dnorm(x), lwd=2)
par(mar=c(5.1, 4.1, 4.1, 2.1))

19:48  (Top Level)  R Script
```

```
Console  Background Jobs
R 4.2.3 · ~/DataVis.github.io/
> par(mar=c(5.1, 4.1, 4.1, 2.1))
> # Histogram
> # happy-planet-index-2006-2020-public-data-set.xlsx
> Y <- rnorm(50)
> # Make sure no Y exceed [-3.5, 3.5]
> Y[Y < -3.5 | Y > 3.5] <- NA # Selection/set range
> x <- seq(-3.5, 3.5, .1)
> dn <- dnorm(x)
> par(mar=c(4.5, 4.1, 3.1, 0))
> hist(Y, breaks=seq(-3.5, 3.5), ylim=c(0, 0.5),
+      col="pink2", freq=FALSE)
> lines(x, dnorm(x), lwd=2)
> par(mar=c(5.1, 4.1, 4.1, 2.1))
>
```

z	num [1:30, 1:30] 0.707 0.651 0.45 0.153 -0.177 ...
Values	
dn	num [1:71] 0.000873 0.001232 0.001723 0.002384 0.003267 ...
midpts	num [1:4] 0.7 1.9 3.1 4.3
pie.sales	Named num [1:6] 0.12 0.3 0.26 0.16 0.04 0.12
x	num [1:71] -3.5 -3.4 -3.3 -3.2 -3.1 -3 -2.9 -2.8 -2.7 -2.6 ...

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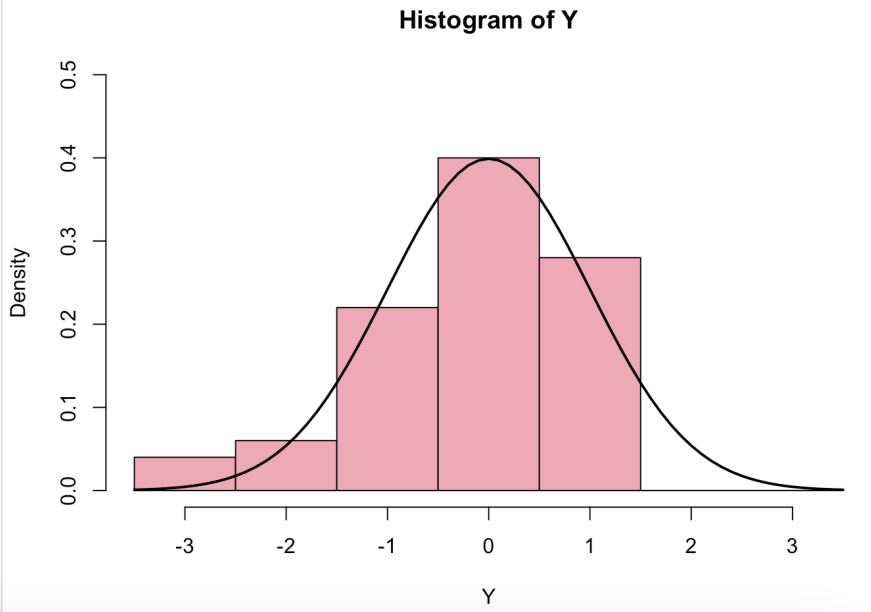
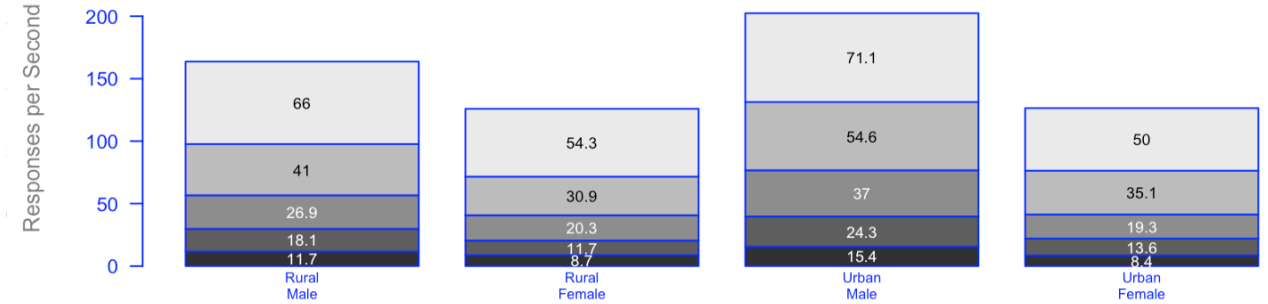
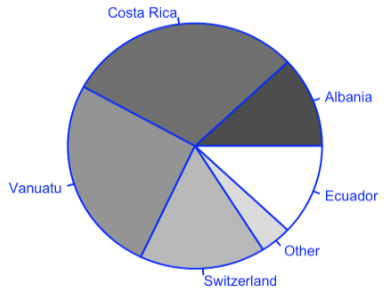


Happy Planet Index Graphs cont’d

- Pie Chart
- Bar Plot





The Future of Data Analysis notes

Title: The Future of Data Analysis: Dr. Edward Tufte's Vision

Data is more than just numbers; it's how we communicate a story. Dr. Edward Tufte, a true trailblazer in the field of Data Science, has significantly contributed to reshaping the way we perceive and utilize data. His work has not only advanced the field of Data Science but has also played a pivotal role in modernizing our world.

In an era where data inundates our lives, Dr. Tufte's insights into data analysis are more relevant than ever. His pioneering efforts have shown us the power of transforming data into a narrative, effectively communicating complex ideas through visualization. Data Science, a discipline that has evolved rapidly, owes much of its progress to luminaries like Dr. Tufte.

One remarkable example of the impact of data analysis can be found at the University of Pittsburgh's School of Public Health. Here, they embarked on a monumental task – digitizing 90 years' worth of morbidity and mortality weekly reports from the Centers for Disease Control and Prevention (CDC). The objective was to examine childhood disease rates across more than 100 different locations. Through meticulous data analysis and the creation of insightful graphs, the team reached a remarkable conclusion: vaccinations had prevented a staggering 106 million cases of childhood diseases and saved the lives of 100 million individuals. This achievement underscored the importance of vaccinations, all made possible by the careful analysis and visualization of data.

The Future of Data Analysis notes

At its core, Data Analysis is about converting information into actionable insights. Analytical thinking, a crucial aspect of this process, involves evaluating the relationship between information and conclusions. Dr. Tufte's work revolves around this fundamental relationship between inference and conclusion. His dedication to this concept has reshaped the way we approach data analysis.

Data visualization and data display, as championed by Dr. Tufte, serve a vital purpose in the analytical thinking process. They act as tools to assist us in reasoning about data's content. These principles are not just about presenting information but also guiding our thought processes. A key task of analytical thinking is to explore and explain mechanisms, uncovering the causes and effects hidden within data.

In conclusion, Dr. Edward Tufte's work and vision have left an indelible mark on the field of Data Science. His emphasis on the importance of transforming data into a narrative, his commitment to the relationship between information and conclusion, and his advocacy for effective data visualization all provide us with valuable insights into the future of data analysis. As we continue to embrace the data-driven world, we can look to Dr. Tufte's contributions as a guiding light, illuminating the path toward more profound discoveries and meaningful insights.