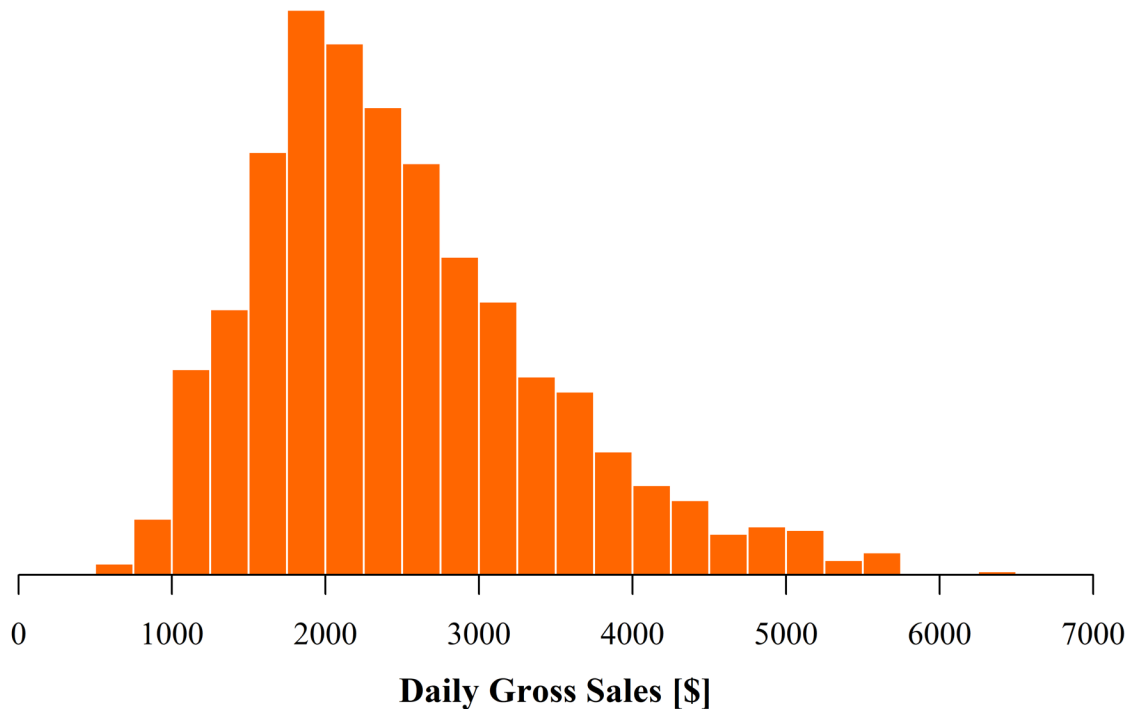Ole J. Forsberg

STAT 200: Elementary Statistics

Practicum Activity 1

April 11, 2012

Gross Sales

Gross sales are defined as the amount of money earned before subtracting costs like taxes, wages, and materials. The following is a histogram of the gross sales at the Lamplighter restaurant for the period between January 5, 2014, and March 17, 2018.


Daily Gross Sales [$]

Note that the distribution appears to be positively (right) skewed. However, the Hildebrand rule (H = 0.1827) indicates that the skew is not significant. As such, the correct measure of center is the mean, $2488, and the correct measure of spread is the standard deviation, $952.

This suggests that I can expect to have gross sales of approximately $2488 on a typical day, with about 68% of my days having gross sales between $1536 and $3439.

Net Profit

The net profit is the amount of money made after subtracting off expenses from the gross sales. It is a better measure of how well the business is doing. The following is a histogram of the net profit made by the Lamplighter restaurant during the period from January 5, 2014, and March 17, 2018.


Daily Net Profit ($)
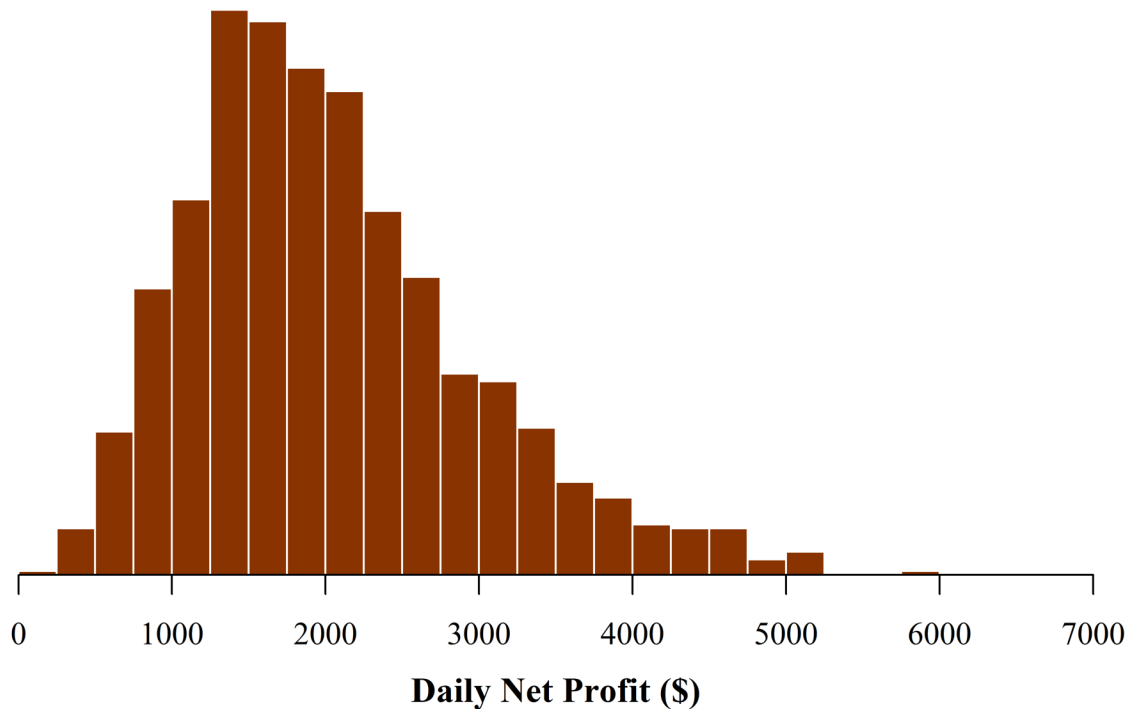
Note that the net profit also appears to be skewed right. The Hildebrand rule, however, indicates that this is not a significant skew (H=0.1723). This again tells us that the mean and the standard deviation are the appropriate measure of center and of spread, respectively. The mean net profit is $2044, and the standard deviation is $928.

As before, this indicates that the net profit made by the restaurant on a typical day is $2044. Approximately 68% of the days will have net profits between $1115 and $2972.
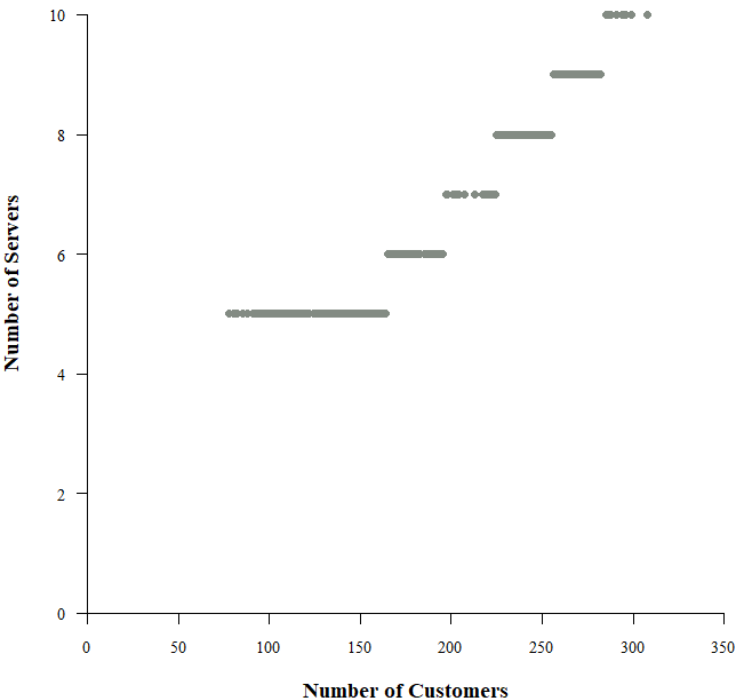
Customers

The following is a histogram of the number of servers daily who worked at the Lamplighter restaurant during the period from January 5, 2014, and March 17, 2018.

Number of Customers ($)
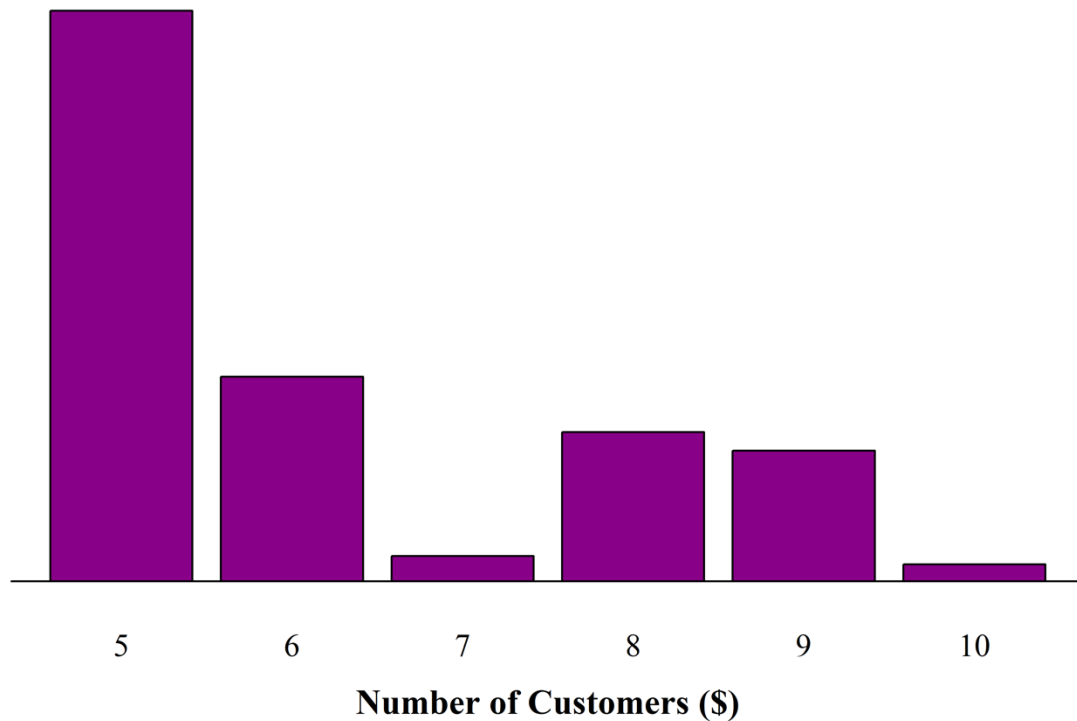
Note that the number of servers also appears to be skewed right. The Hildebrand rule concurs on this assessment, indicating a significant skew (H=0.7754). This tells us that the median and the interquartile range are the appropriate measure of center and of spread, respectively. The median number of servers is 5, and the interquartile range is 3.

This indicates that the number of servers was around 5 on a typical day. Approximately 50% of the days had between 5 and 8 servers. Actually, 52% of the time, the Lamplighter had five servers.

Customer and Server Relationship

The above graphic shows the relationship between the number of customers in the Lamp Lighter and the number of servers. As expected, the relationship is positive. As the number of customers increases, so does the number of servers.

Appendix: R Code

```
##### Practicum One
#####

### Preamble
source("http://rfs.kvasaheim.com/stat200.R")

dt = read.csv("lamplighterSales.csv")
summary(dt)
attach(dt)



### Gross Sales

# Sample statistics
hildebrand.rule(grossSales)
mean(grossSales)
sd(grossSales)

mean(grossSales)+sd(grossSales)
mean(grossSales)-sd(grossSales)

# Graphic
theme()
histogram(grossSales, col="#ff6600", breaks=seq(0,7000,250))
axis(1)
title(xlab="Daily Gross Sales [$]", line=2.5)



### Net Profit

# Sample statistics
hildebrand.rule(netProfit)
mean(netProfit)
sd(netProfit)

mean(netProfit)-sd(netProfit)
mean(netProfit)+sd(netProfit)

# Graphic
theme()
histogram(netProfit, col="#883300", breaks=seq(0,7000,250))
axis(1)
title(xlab="Daily Net Profit ($)", line=2.5)



### Customers

# Sample statistics
hildebrand.rule(servers)
median(servers)
IQR(servers)

quartile(servers)

mean(servers==5)
```

```
# Graphic
theme()
barplot( table(servers), col="#880088")
abline(h=0)
title(xlab="Number of Customers ($)", line=2.5)



### Customer-Server Relationship

cor(customers,servers)

theme()

plot.new()
plot.window(xlim=c(0,350), ylim=c(0,11))

axis(1); axis(2)
title(xlab="Number of Customers")
title(ylab="Number of Servers")

points(customers,servers, col="honeydew4", cex=1.5)
```