Basic Plots

19MID0017

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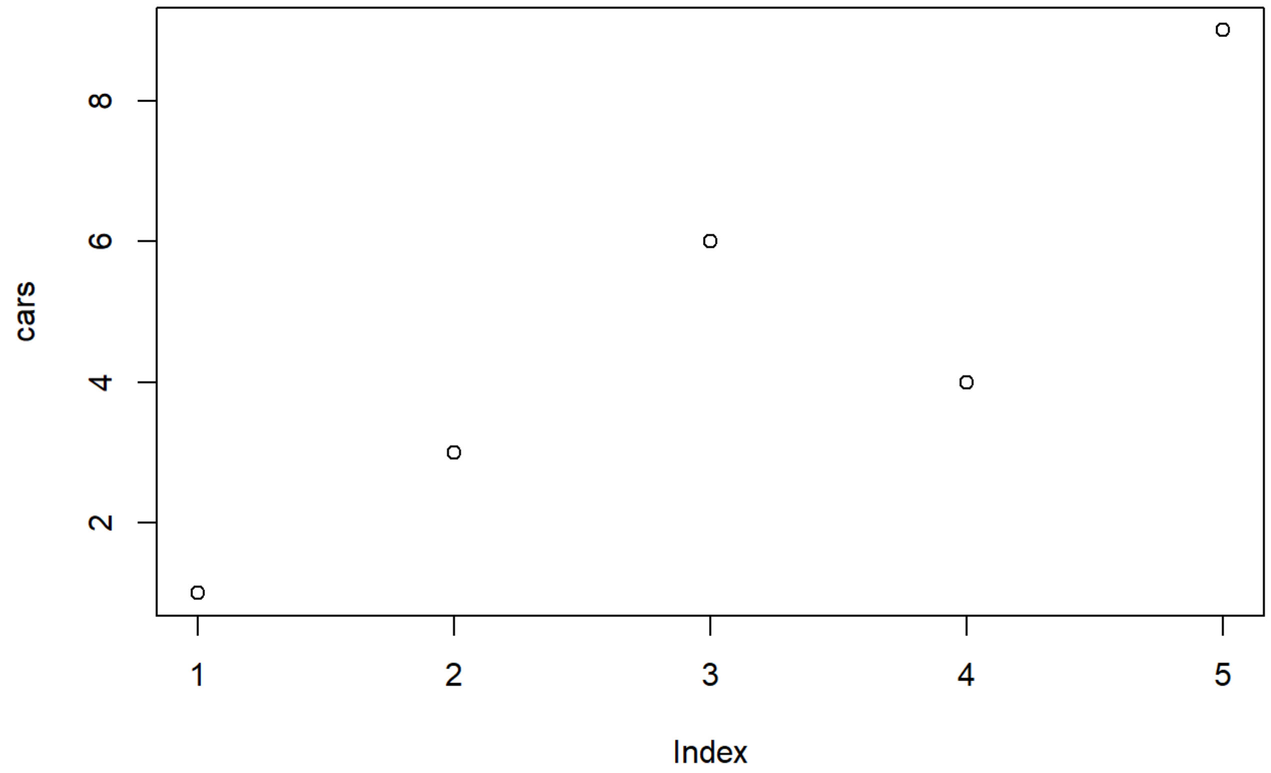
Line Chart

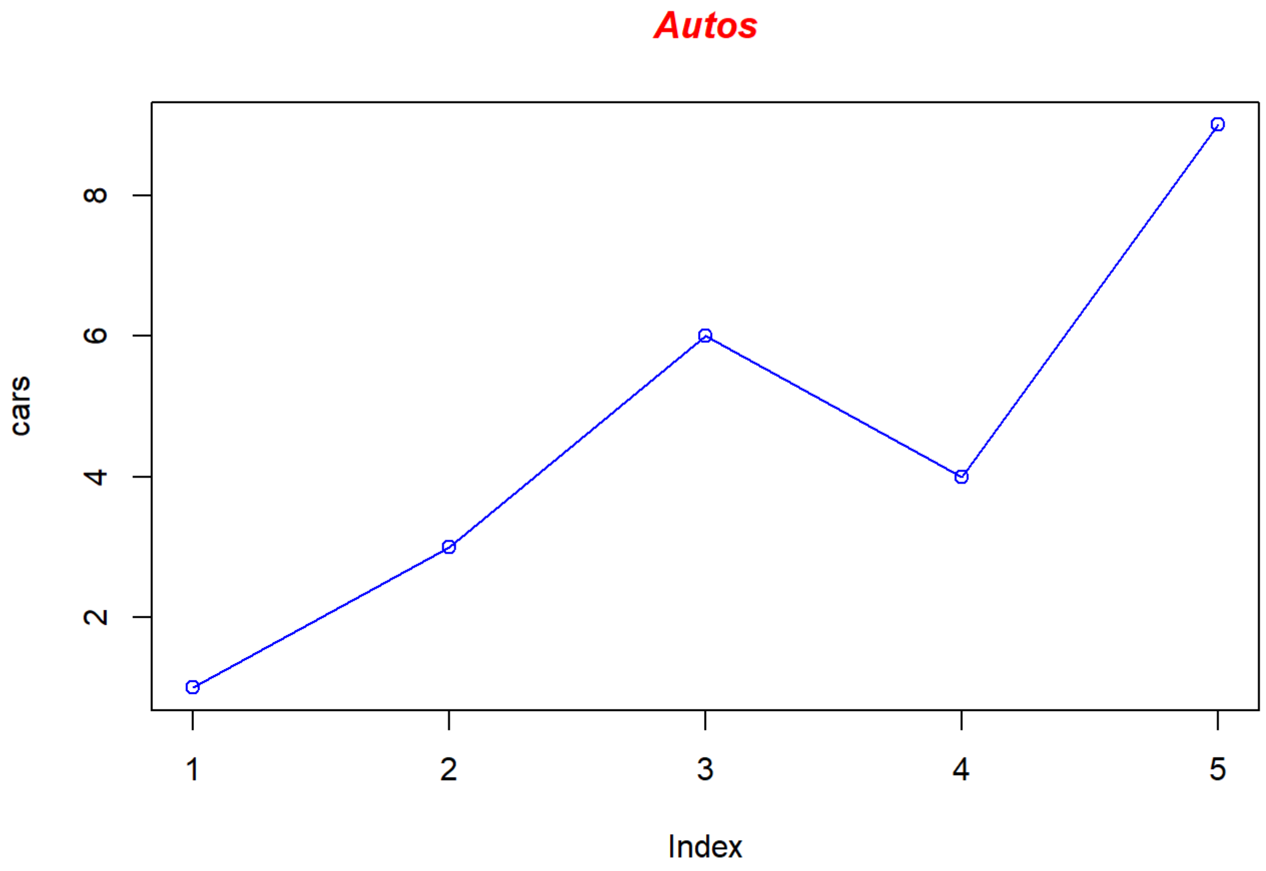
```
cars <- c(1, 3, 6, 4, 9)
plot(cars)
```



Adding Details

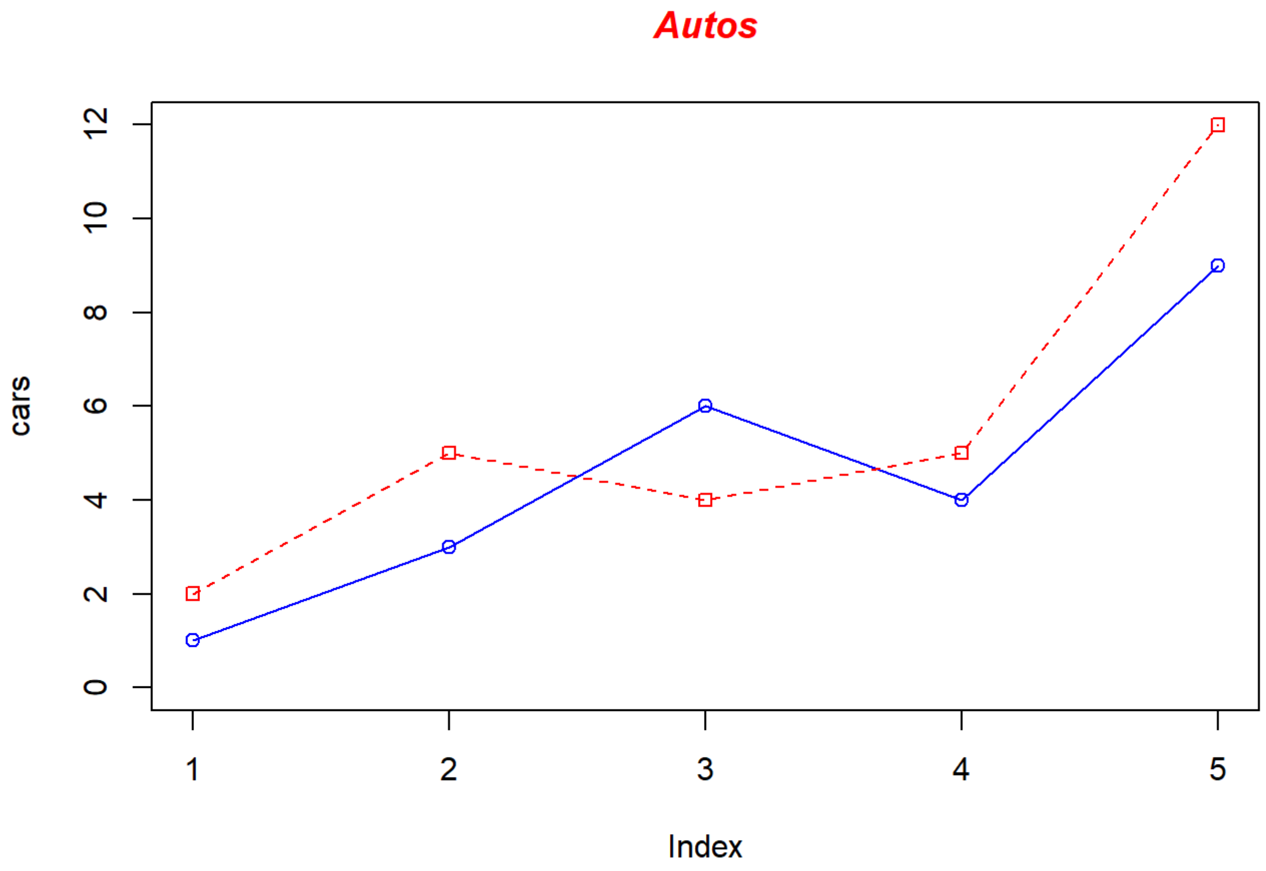
Let’s add a title, a line to connect the points, and some color:

```
plot(cars, type="o", col="blue")
# Create a title with a red, bold/italic font
title(main="Autos", col.main="red", font.main=4)
```



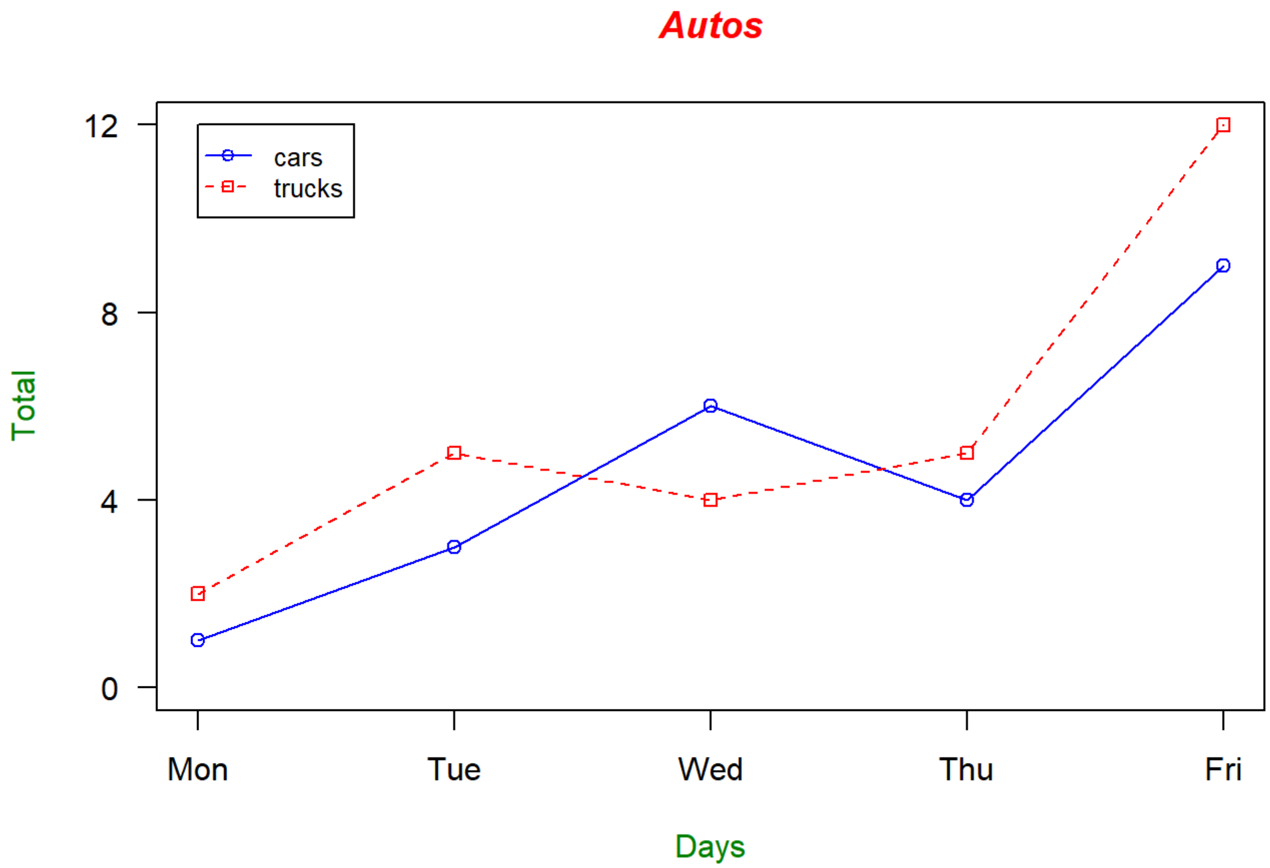
Now let’s add a red line for trucks and specify the y-axis range directly so it will be large enough to fit the truck data:

```
trucks <- c(2, 5, 4, 5, 12)
# Graph cars using a y axis that ranges from 0 to 12
plot(cars, type="o", col="blue", ylim=c(0,12))
# Graph trucks with red dashed line and square points
lines(trucks, type="o", pch=22, lty=2, col="red")
# Create a title with a red, bold/italic font
title(main="Autos", col.main="red", font.main=4)
```



Next let’s change the axes labels to match our data and add a legend. We’ll also compute the y-axis values using the max function so any changes to our data will be automatically reflected in our graph.

```
# Calculate range from 0 to max value of cars and trucks
g_range <- range(0, cars, trucks)
# Graph autos using y axis that ranges from 0 to max
# value in cars or trucks vector. Turn off axes and
# annotations (axis labels) so we can specify them ourself
plot(cars, type="o", col="blue", ylim=g_range,
axes=FALSE, ann=FALSE)
# Make x axis using Mon-Fri labels
axis(1, at=1:5, lab=c("Mon","Tue","Wed","Thu","Fri"))
# Make y axis with horizontal labels that display ticks at
# every 4 marks. 4*0:g_range[2] is equivalent to c(0,4,8,12).
axis(2, las=1, at=4*0:g_range[2])
# Create box around plot
box()
# Graph trucks with red dashed line and square points
lines(trucks, type="o", pch=22, lty=2, col="red")
# Create a title with a red, bold/italic font
title(main="Autos", col.main="red", font.main=4)
# Label the x and y axes with dark green text
title(xlab="Days", col.lab=rgb(0,0.5,0))
title(ylab="Total", col.lab=rgb(0,0.5,0))
# Create a legend at (1, g_range[2]) that is slightly smaller
# (cex) and uses the same line colors and points used by
# the actual plots
legend(1, g_range[2], c("cars","trucks"), cex=0.8,
col=c("blue","red"), pch=21:22, lty=1:2);
```


Autos
cars
trucks
12
8
4
0
Total
Mon
Tue
Wed
Thu
Fri
Days

```
# Read car and truck values from tab-delimited autos.dat
autos_data <- read.table("autos.dat", header=T, sep="\t")
# Compute the largest y value used in the data (or we could
# just use range again)
max_y <- max(autos_data)
# Define colors to be used for cars, trucks, suvs
plot_colors <- c("blue","red","forestgreen")
# Start PNG device driver to save output to figure.png
png(filename="figure.png", height=295, width=300,bg="white")
# Graph autos using y axis that ranges from 0 to max_y.
# Turn off axes and annotations (axis labels) so we can
# specify them ourself
plot(autos_data$cars, type="o", col=plot_colors[1],
ylim=c(0,max_y), axes=FALSE, ann=FALSE)
# Make x axis using Mon-Fri labels
axis(1, at=1:5, lab=c("Mon", "Tue", "Wed", "Thu", "Fri"))
# Make y axis with horizontal labels that display ticks at
# every 4 marks. 4*0:max_y is equivalent to c(0,4,8,12).
axis(2, las=1, at=4*0:max_y)
# Create box around plot
box()
# Graph trucks with red dashed line and square points
lines(autos_data$trucks, type="o", pch=22, lty=2,
col=plot_colors[2])
# Graph suvs with green dotted line and diamond points
lines(autos_data$suvs, type="o", pch=23, lty=3,
col=plot_colors[3])
# Create a title with a red, bold/italic font
title(main="Autos", col.main="red", font.main=4)
# Label the x and y axes with dark green text
title(xlab= "Days", col.lab=rgb(0,0.5,0))
title(ylab= "Total", col.lab=rgb(0,0.5,0))
# Create a legend at (1, max_y) that is slightly smaller
# (cex) and uses the same line colors and points used by
# the actual plots
legend(1, max_y, names(autos_data), cex=0.8, col=plot_colors,
pch=21:23, lty=1:3);
# Turn off device driver (to flush output to png)
dev.off()
```

```
## png
##   2
```

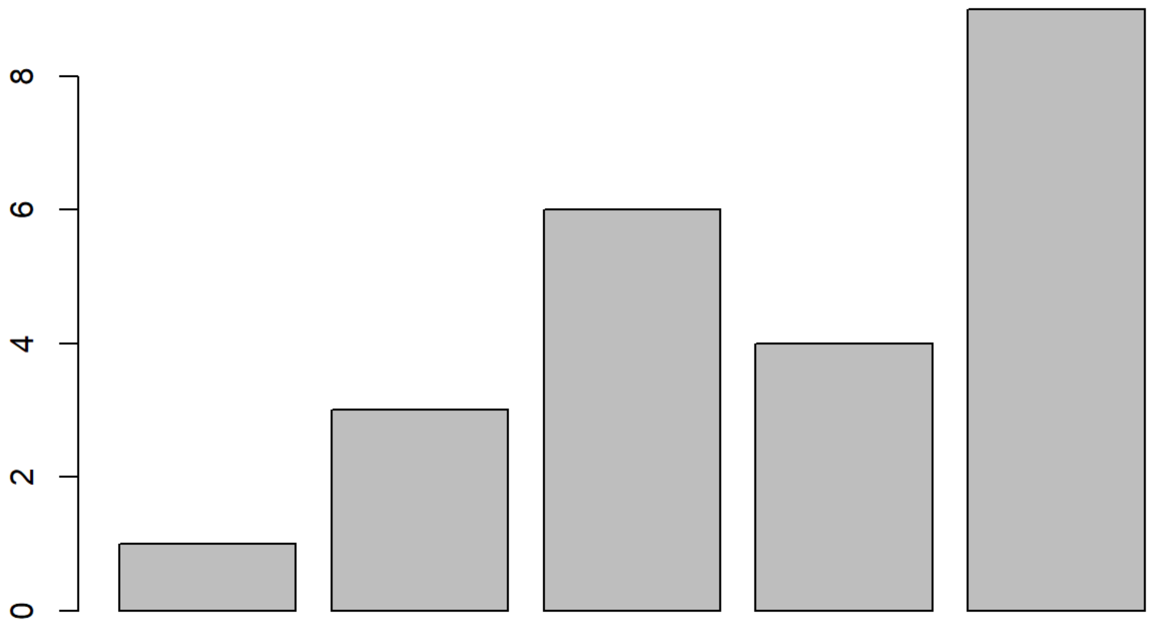
```
# Read car and truck values from tab-delimited autos.dat
autos_data <- read.table("autos.dat", header=T, sep="\t")
# Define colors to be used for cars, trucks, suvs
plot_colors <- c(rgb(r=0.0,g=0.0,b=0.9), "red", "forestgreen")
# Start PDF device driver to save output to figure.pdf
pdf(file="figure.pdf", height=3.5, width=5)
# Trim off excess margin space (bottom, left, top, right)
par(mar=c(4.2, 3.8, 0.2, 0.2))
# Graph autos using a y axis that uses the full range of value
# in autos_data. Label axes with smaller font and use larger
# line widths.
plot(autos_data$cars, type="l", col=plot_colors[1],
ylim=range(autos_data), axes=F, ann=T, xlab="Days",
ylab="Total", cex.lab=0.8, lwd=2)
# Make x axis tick marks without labels
axis(1, lab=F)
# Plot x axis labels at default tick marks with labels at
# 45 degree angle
text(axTicks(1), par("usr")[3] - 2, srt=45, adj=1,
labels=c("Mon", "Tue", "Wed", "Thu", "Fri"),
xpd=T, cex=0.8)
# Plot y axis with smaller horizontal labels
axis(2, las=1, cex.axis=0.8)
# Create box around plot
box()
# Graph trucks with thicker red dashed line
lines(autos_data$trucks, type="l", lty=2, lwd=2,
col=plot_colors[2])
# Graph suvs with thicker green dotted line
lines(autos_data$suvs, type="l", lty=3, lwd=2,
col=plot_colors[3])
# Create a legend in the top-left corner that is slightly
# smaller and has no border
legend("topleft", names(autos_data), cex=0.8, col=plot_colors,
lty=1:3, lwd=2, bty="n");
# Turn off device driver (to flush output to PDF)
dev.off()
```

```
## png
##   2
```

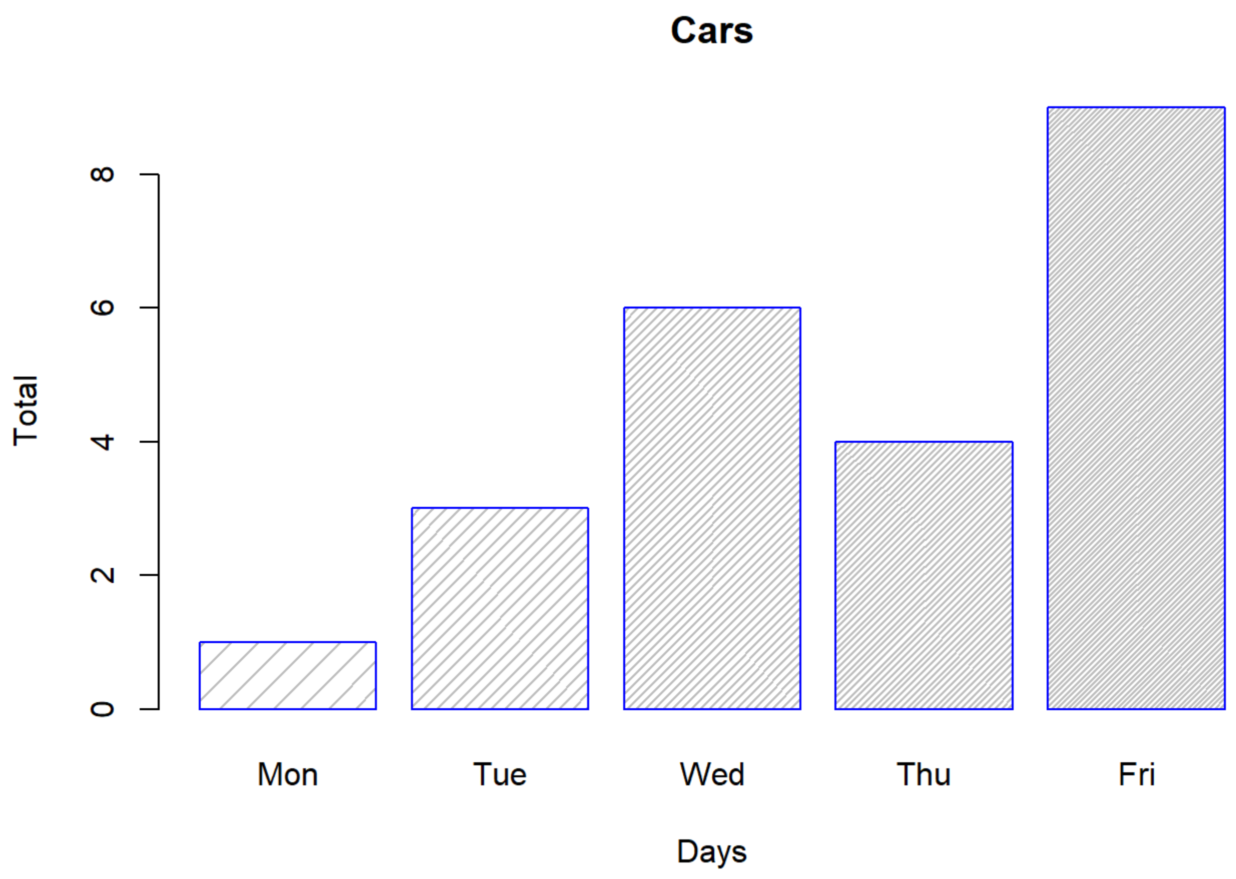
```
# Restore default margins
par(mar=c(5, 4, 4, 2) + 0.1)
```

Bar Charts

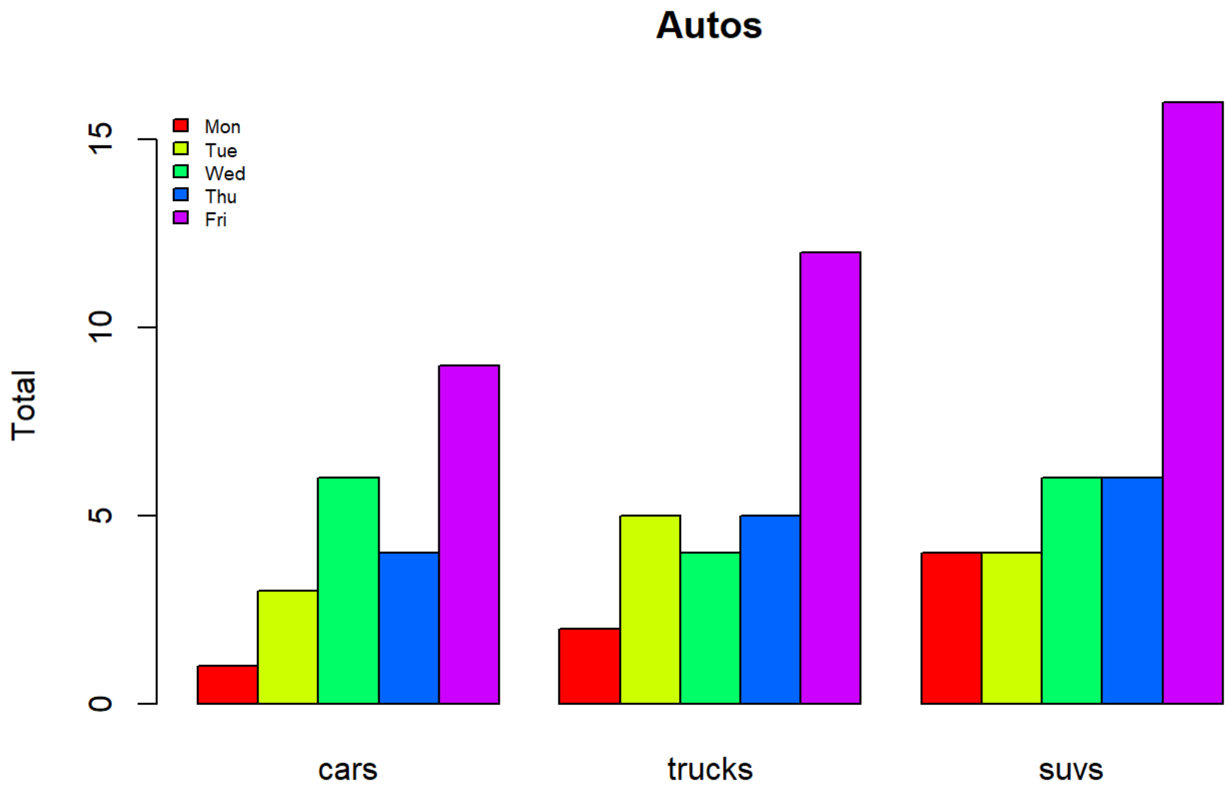
```
# Define the cars vector with 5 values
cars <- c(1, 3, 6, 4, 9)
# Graph cars
barplot(cars)
```



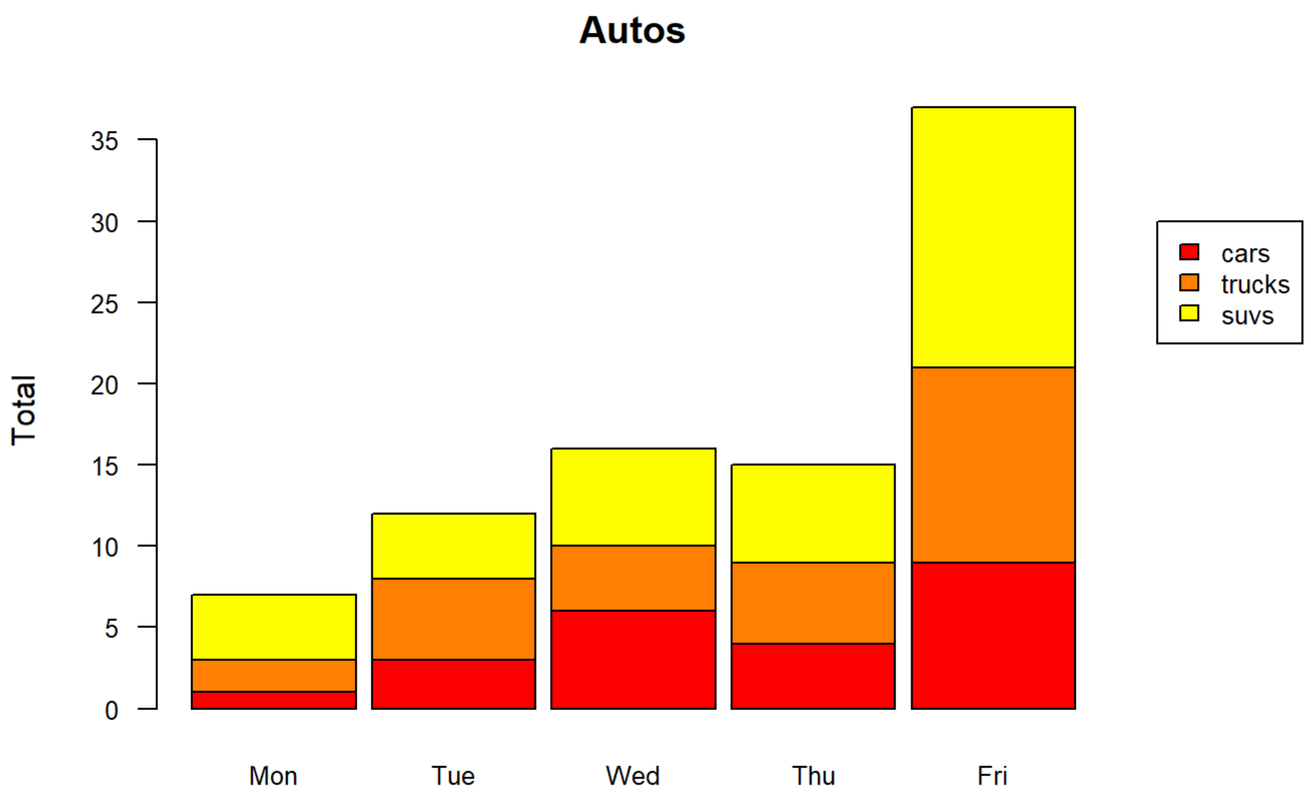
```
# Read values from tab-delimited autos.dat
autos_data <- read.table("autos.dat", header=T, sep="\t")
# Graph cars with specified labels for axes. Use blue
# borders and diagnal lines in bars.
barplot(autos_data$cars, main="Cars", xlab="Days",
ylab="Total", names.arg=c("Mon","Tue","Wed","Thu","Fri"),
border="blue", density=c(10,20,30,40,50))
```



```
# Read values from tab-delimited autos.dat
autos_data <- read.table("autos.dat", header=T, sep="\t")
# Graph autos with adjacent bars using rainbow colors
barplot(as.matrix(autos_data), main="Autos", ylab= "Total",
beside=TRUE, col=rainbow(5))
# Place the legend at the top-left corner with no frame
# using rainbow colors
legend("topleft", c("Mon","Tue","Wed","Thu","Fri"), cex=0.6,
bty="n", fill=rainbow(5))
```



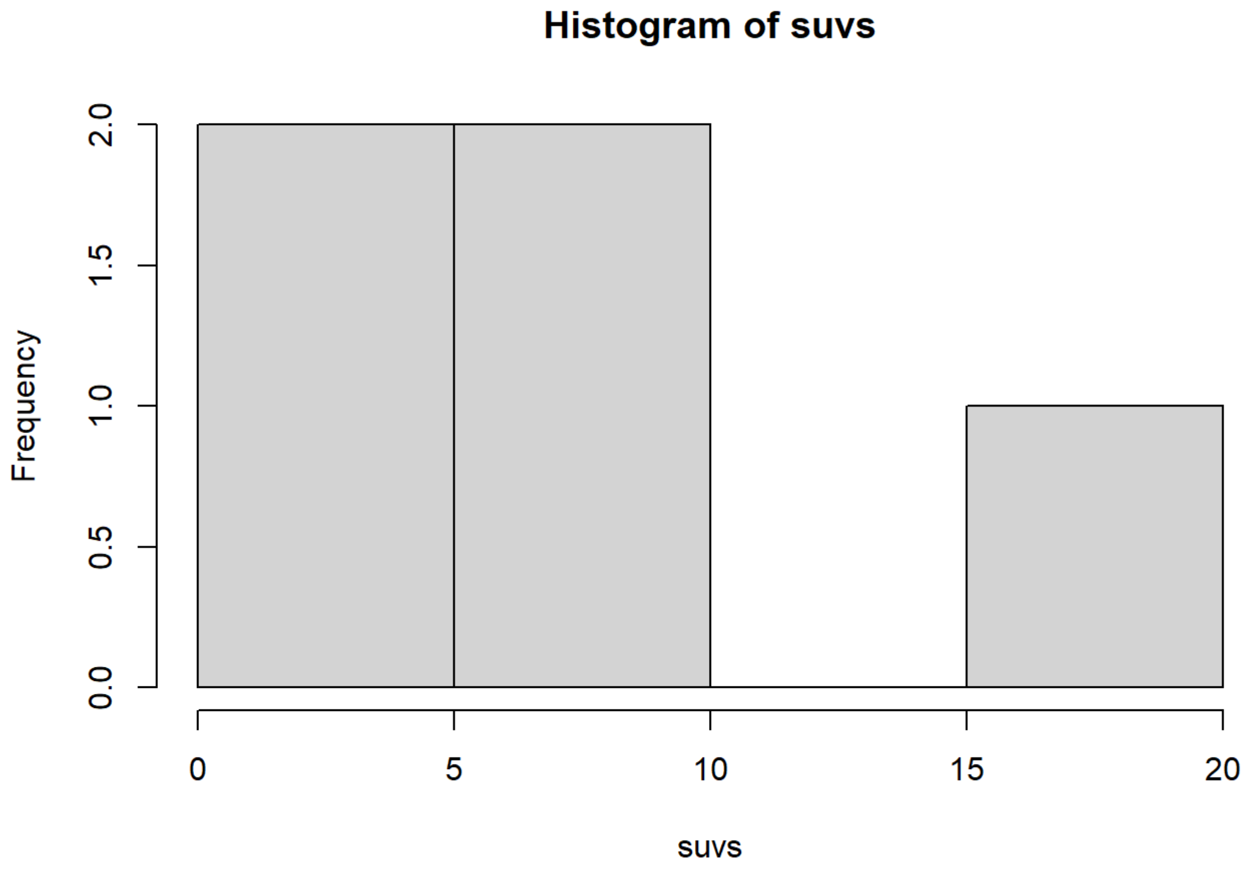
```
# Read values from tab-delimited autos.dat
autos_data <- read.table("autos.dat", header=T, sep="\t")
# Expand right side of clipping rect to make room for the legend
par(xpd=T, mar=par()$mar+c(0,0,0,4))
# Graph autos (transposing the matrix) using heat colors,
# put 10% of the space between each bar, and make labels
# smaller with horizontal y-axis labels
barplot(t(autos_data), main="Autos", ylab="Total",col=heat.colors(3), space=0.1, cex.axis=0.8
, las=1,
names.arg=c("Mon","Tue","Wed","Thu","Fri"), cex=0.8)
# Place the legend at (6,30) using heat colors
legend(6, 30, names(autos_data), cex=0.8, fill=heat.colors(3));
```



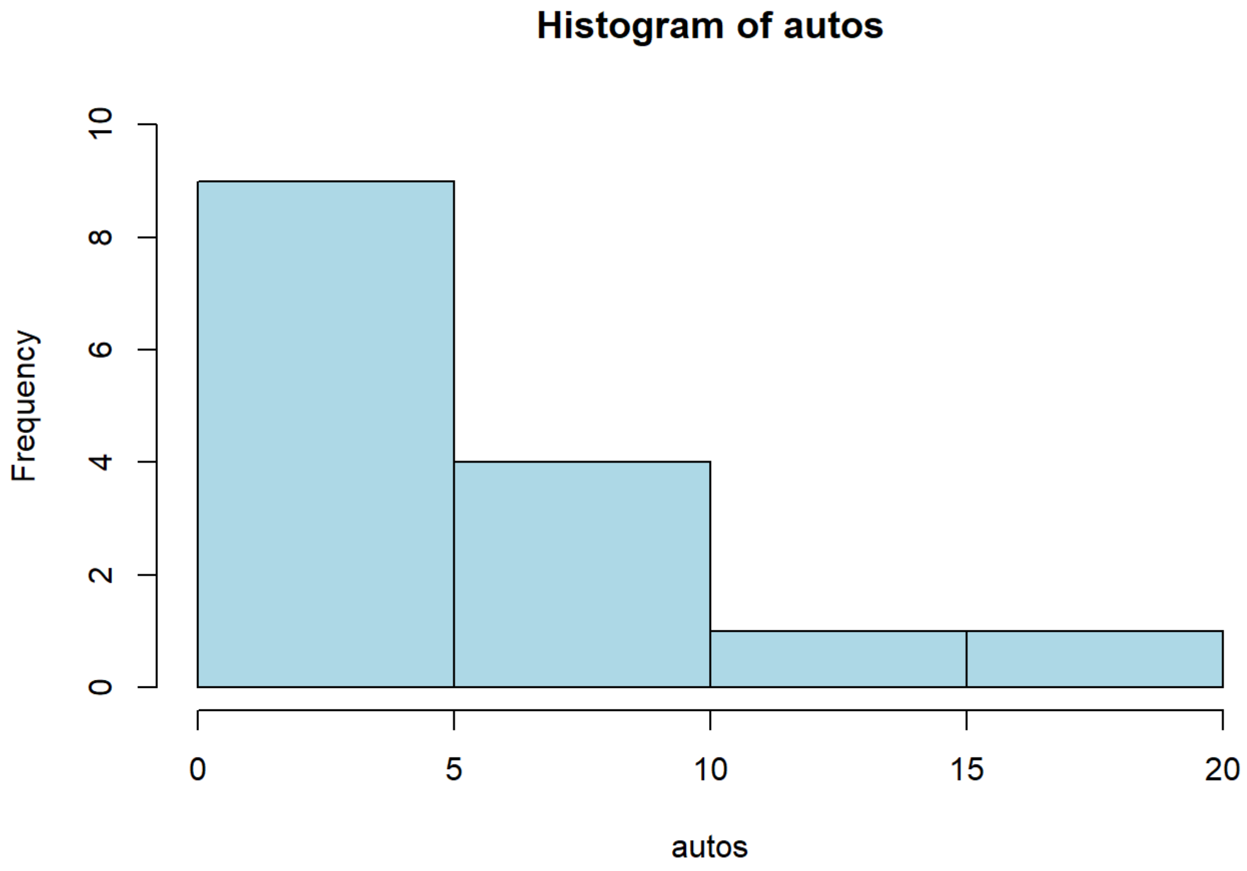
```
# Restore default clipping rect
par(mar=c(5, 4, 4, 2) + 0.1)
```

Histograms

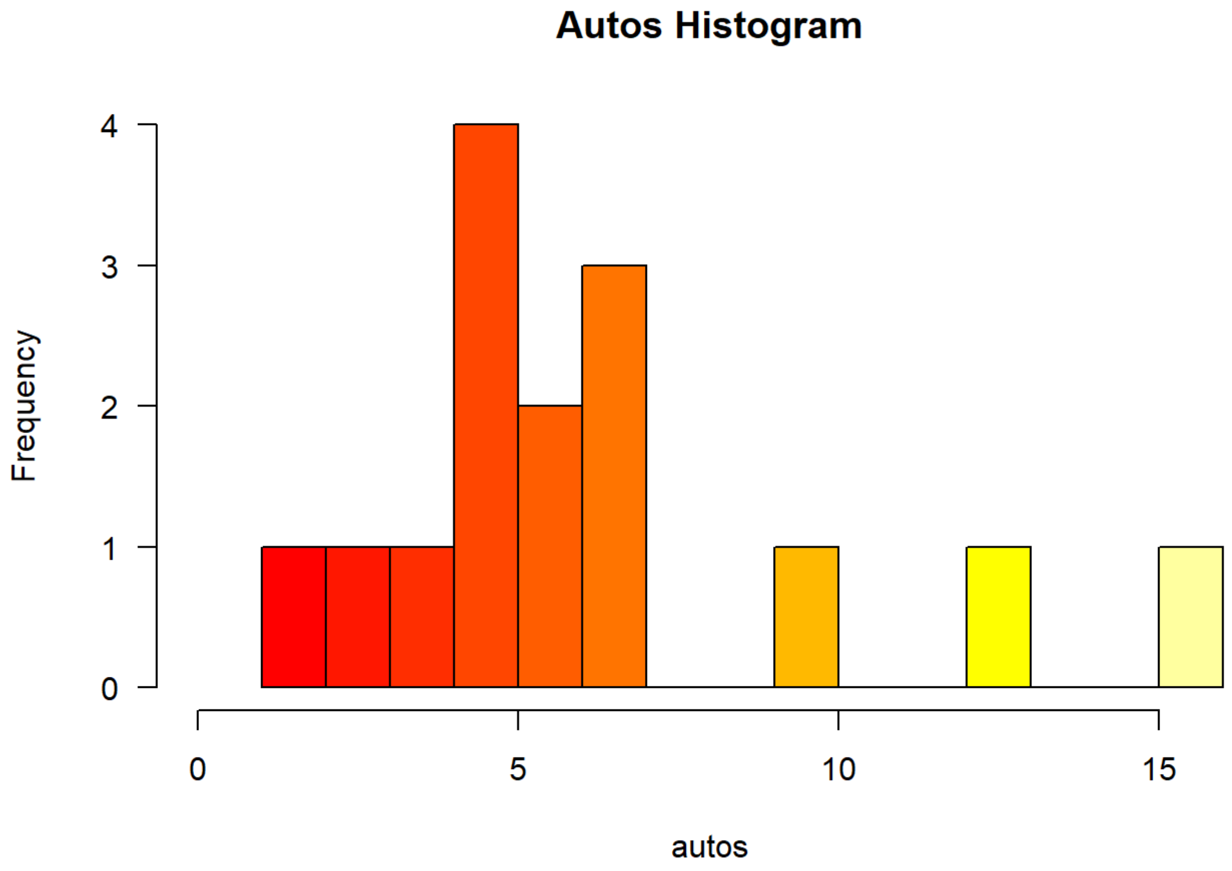
```
# Define the suvs vector with 5 values
suvs <- c(4,4,6,6,16)
# Create a histogram for suvs
hist(suvs)
```



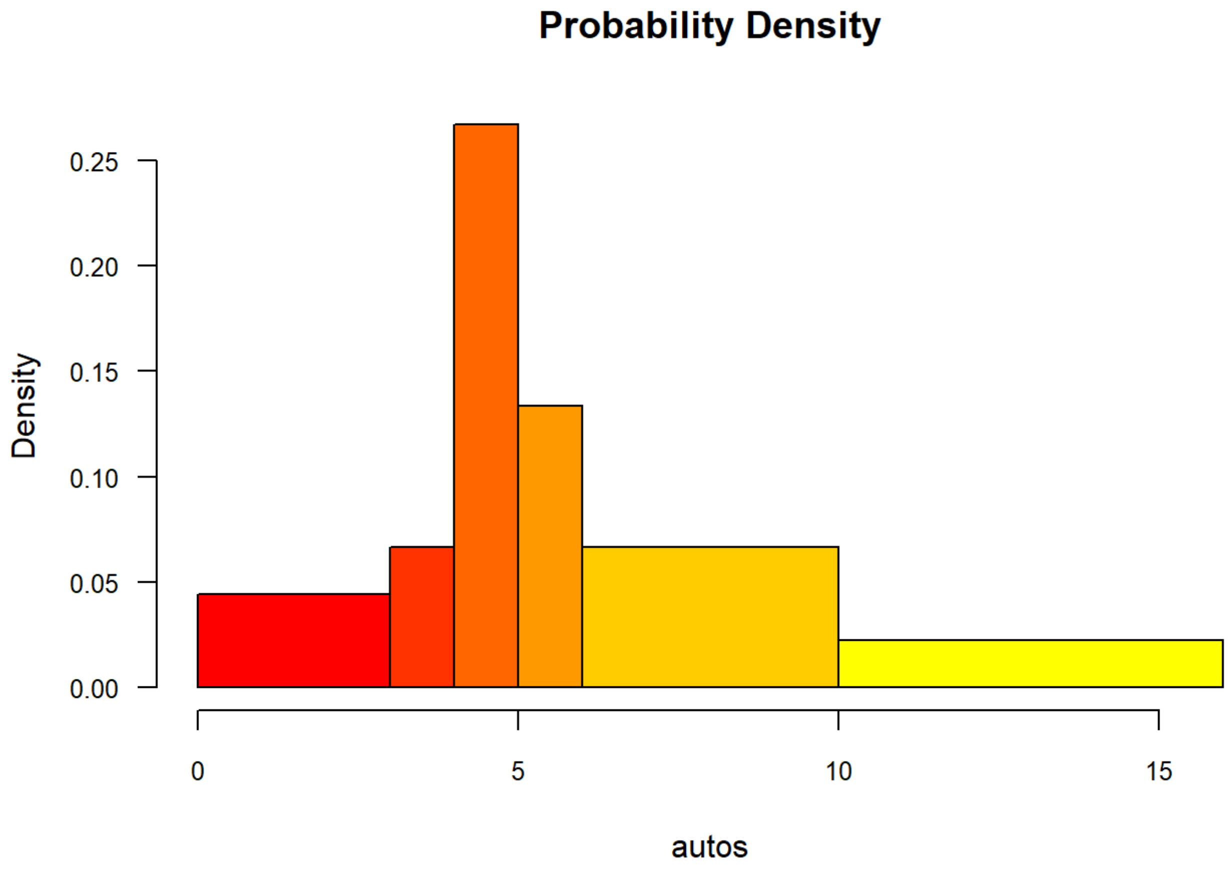
```
# Read values from tab-delimited autos.dat
autos_data <- read.table("autos.dat", header=T, sep="\t")
# Concatenate the three vectors
autos <- c(autos_data$cars, autos_data$trucks,
autos_data$suvs)
# Create a histogram for autos in light blue with the y axis
# ranging from 0-10
hist(autos, col="lightblue", ylim=c(0,10))
```



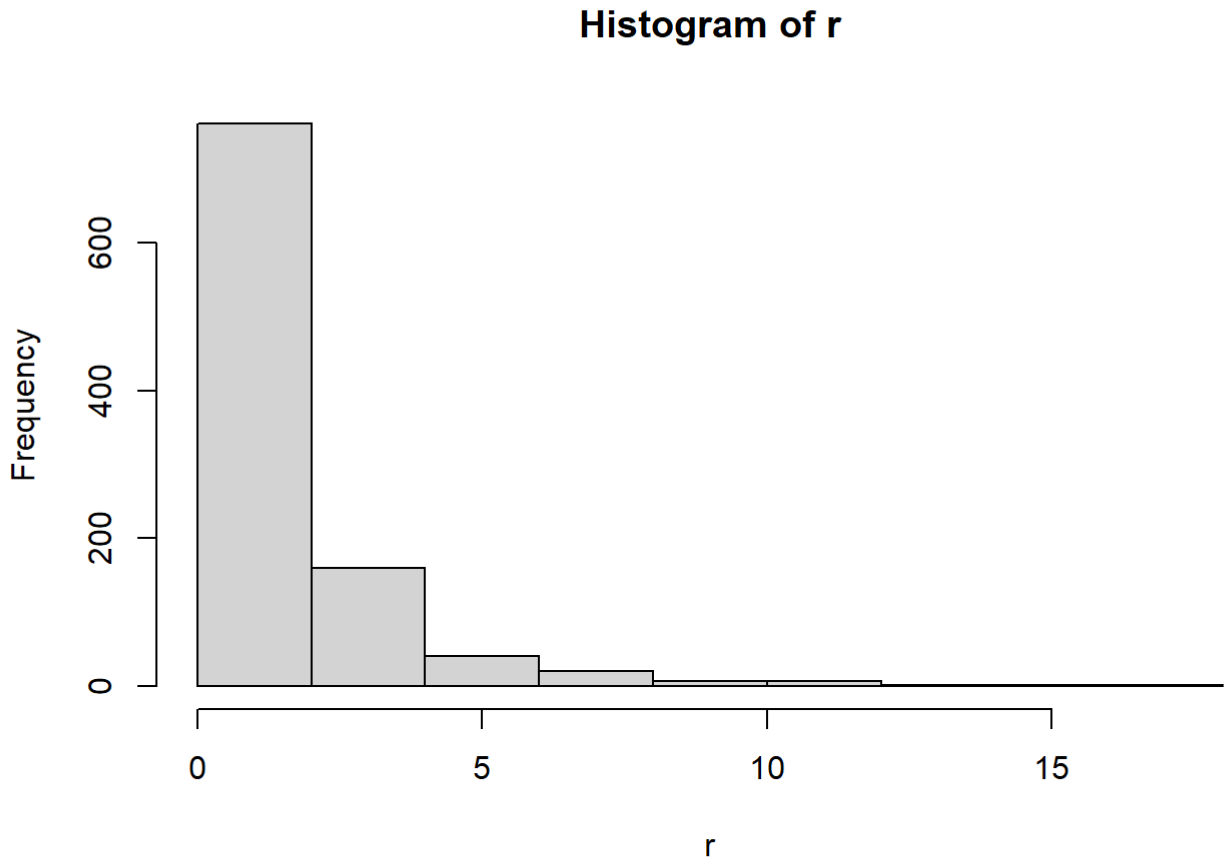
```
# Read values from tab-delimited autos.dat
autos_data <- read.table("autos.dat", header=T, sep="\t")
# Concatenate the three vectors
autos <- c(autos_data$cars, autos_data$trucks,
autos_data$suvs)
# Compute the largest y value used in the autos
max_num <- max(autos)
# Create a histogram for autos with fire colors, set breaks
# so each number is in its own group, make x axis range from
# 0-max_num, disable right-closing of cell intervals, set
# heading, and make y-axis labels horizontal
hist(autos, col=heat.colors(max_num), breaks=max_num,
xlim=c(0,max_num), right=F, main="Autos Histogram", las=1)
```



```
# Read values from tab-delimited autos.dat
autos_data <- read.table("autos.dat", header=T, sep="\t")
# Concatenate the three vectors
autos <- c(autos_data$cars, autos_data$trucks,
autos_data$suvs)
# Compute the largest y value used in the autos
max_num <- max(autos)
# Create uneven breaks
brk <- c(0,3,4,5,6,10,16)
# Create a histogram for autos with fire colors, set uneven
# breaks, make x axis range from 0-max_num, disable right-
# closing of cell intervals, set heading, make y-axis labels
# horizontal, make axis labels smaller, make areas of each
# column proportional to the count
hist(autos, col=heat.colors(length(brk)), breaks=brk,
xlim=c(0,max_num), right=F, main="Probability Density",
las=1, cex.axis=0.8, freq=F)
```

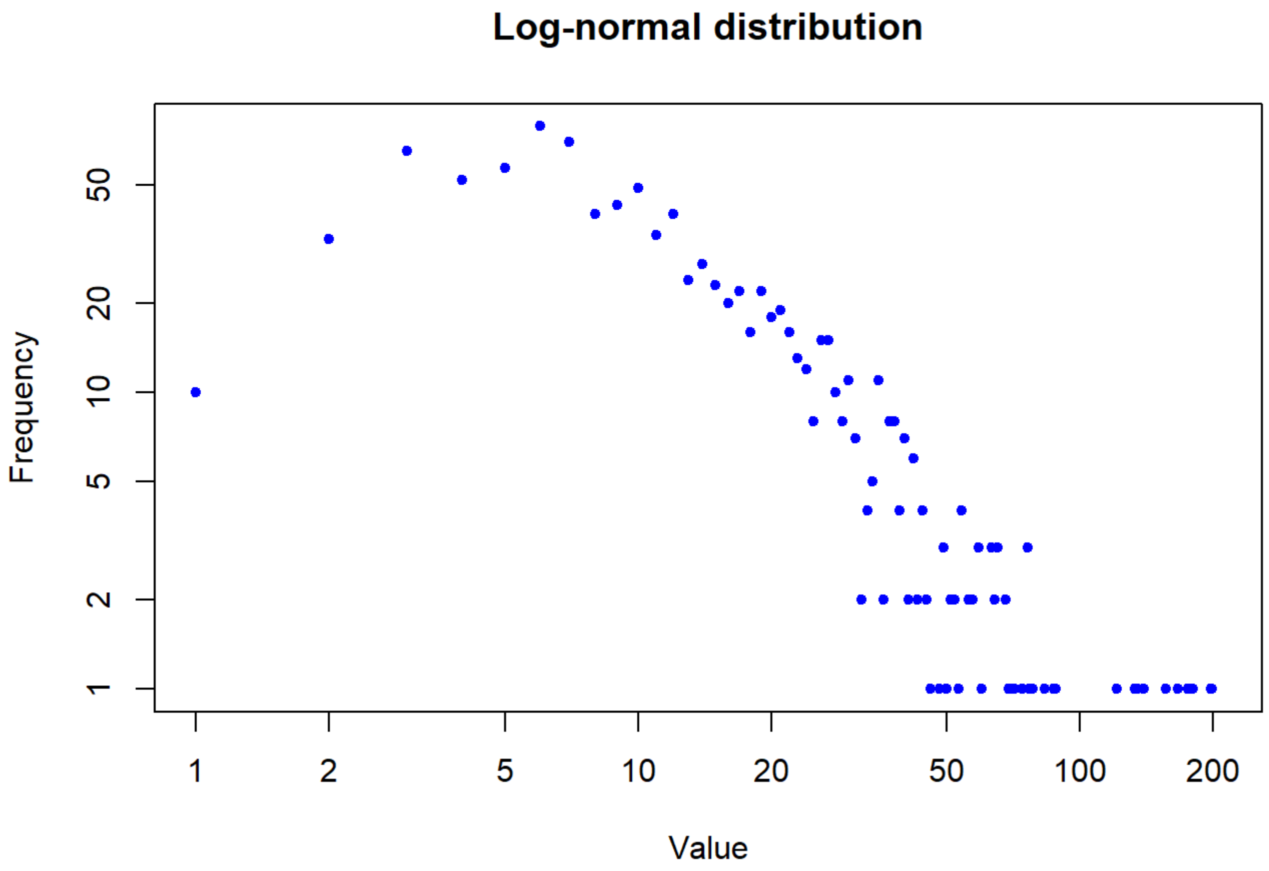


```
r <- rlnorm(1000)
hist(r)
```

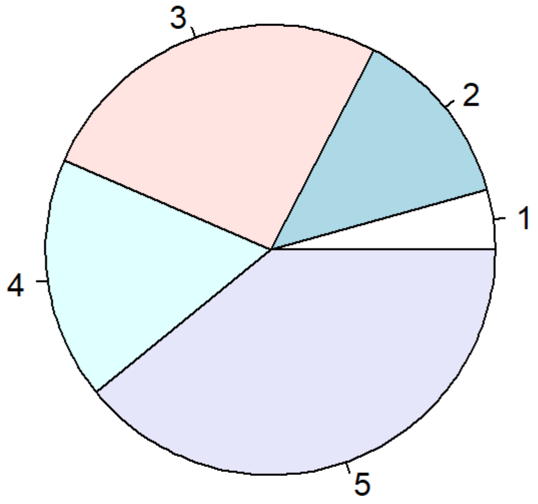


```
# Get a random Log-normal distribution
r <- rlnorm(1000)
# Get the distribution without plotting it using tighter breaks
h <- hist(r, plot=F, breaks=c(seq(0,max(r)+1, .1)))
# Plot the distribution using Log scale on both axes, and use
# blue points
plot(h$counts, log="xy", pch=20, col="blue",
main="Log-normal distribution",
xlab="Value", ylab="Frequency")
```

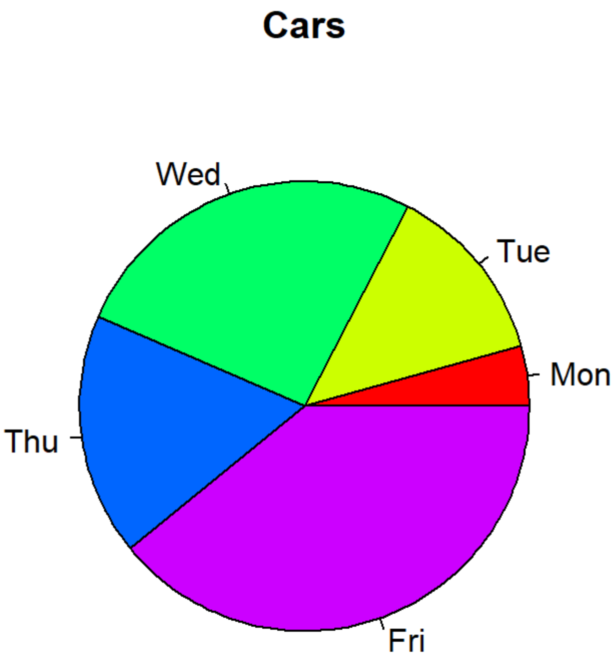
```
## Warning in xy.coords(x, y, xlabel, ylabel, log): 127 y values <= 0 omitted from
## logarithmic plot
```



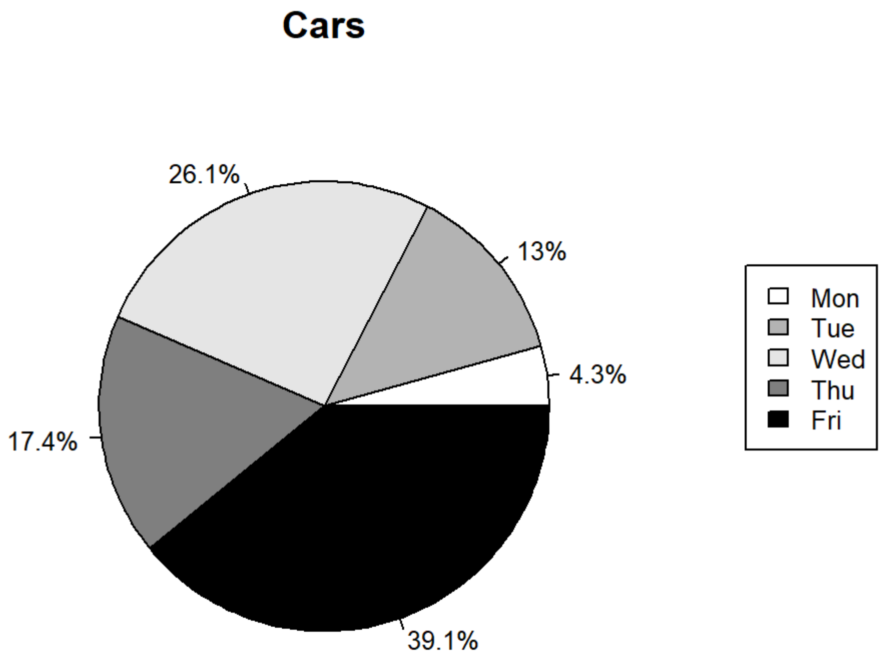
```
# Define cars vector with 5 values
cars <- c(1, 3, 6, 4, 9)
# Create a pie chart for cars
pie(cars)
```



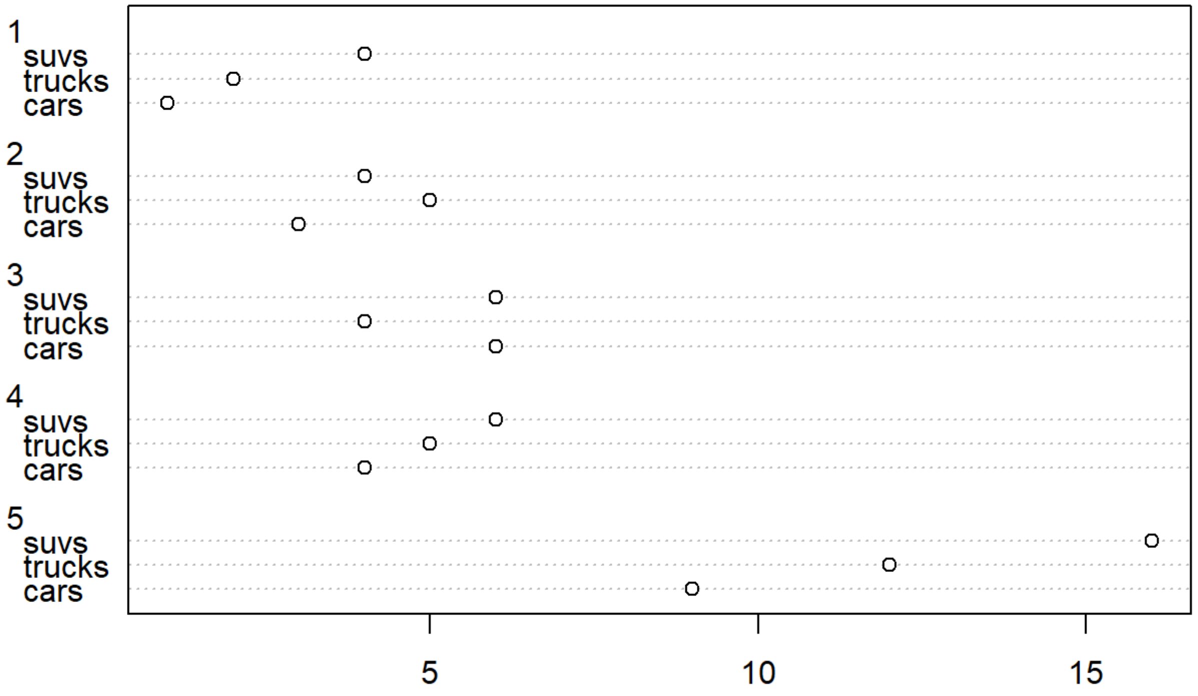
```
# Define cars vector with 5 values
cars <- c(1, 3, 6, 4, 9)
# Create a pie chart with defined heading and
# custom colors and labels
pie(cars, main="Cars", col=rainbow(length(cars)),
labels=c("Mon","Tue","Wed","Thu","Fri"))
```



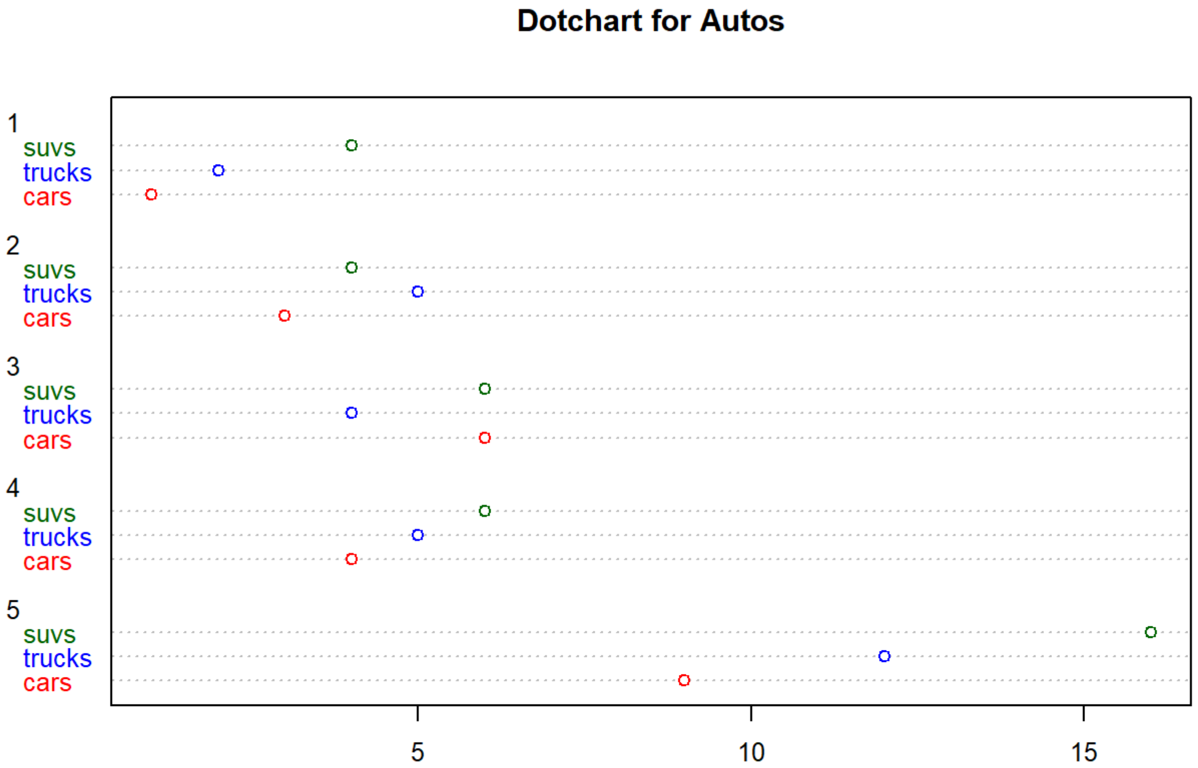
```
# Define cars vector with 5 values
cars <- c(1, 3, 6, 4, 9)
# Define some colors ideal for black & white print
colors <- c("white","grey70","grey90","grey50","black")
# Calculate the percentage for each day, rounded to one
# decimal place
car_labels <- round(cars/sum(cars) * 100, 1)
# Concatenate a '%' char after each value
car_labels <- paste(car_labels, "%", sep="")
# Create a pie chart with defined heading and custom colors
# and labels
pie(cars, main="Cars", col=colors, labels=car_labels,
cex=0.8)
# Create a legend at the right
legend(1.5, 0.5, c("Mon","Tue","Wed","Thu","Fri"), cex=0.8,
fill=colors)
```



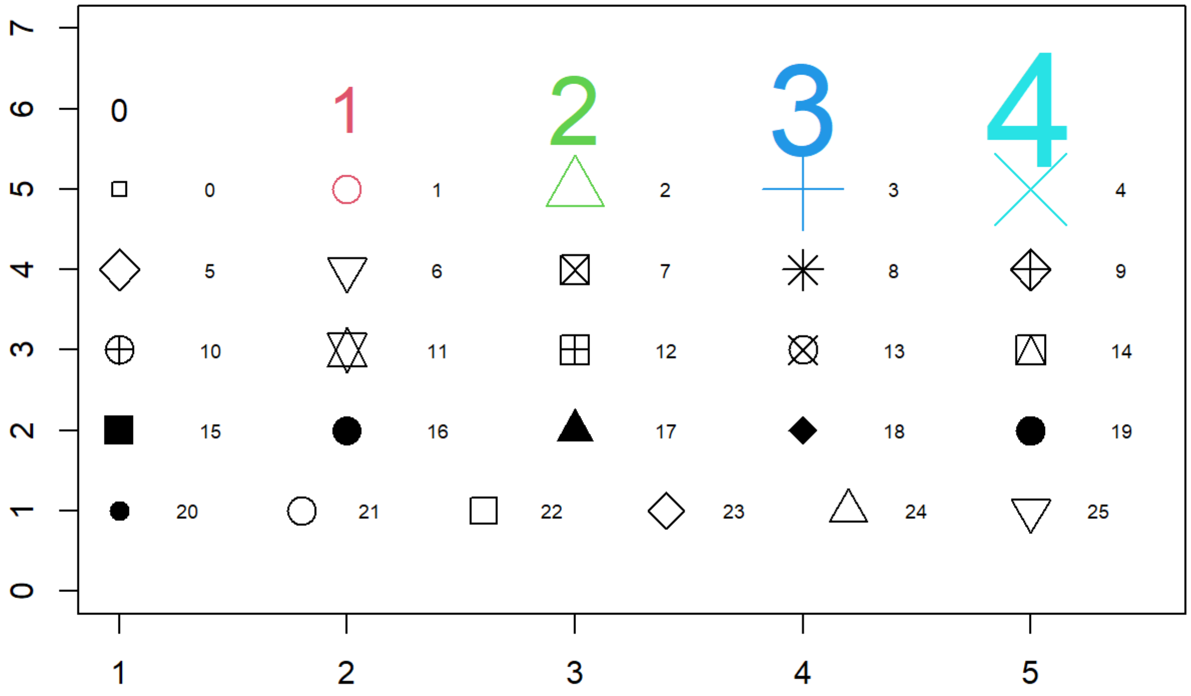
```
# Read values from tab-delimited autos.dat
autos_data <- read.table("autos.dat", header=T, sep="\t")
# Create a dotchart for autos
dotchart(t(autos_data))
```



```
# Read values from tab-delimited autos.dat
autos_data <- read.table("autos.dat", header=T, sep="\t")
# Create a colored dotchart for autos with smaller labels
dotchart(t(autos_data), color=c("red","blue","darkgreen"),
main="Dotchart for Autos", cex=0.8)
```



```
# Make an empty chart
plot(1, 1, xlim=c(1,5.5), ylim=c(0,7), type="n", ann=FALSE)
# Plot digits 0-4 with increasing size and color
text(1:5, rep(6,5), labels=c(0:4), cex=1:5, col=1:5)
# Plot symbols 0-4 with increasing size and color
points(1:5, rep(5,5), cex=1:5, col=1:5, pch=0:4)
text((1:5)+0.4, rep(5,5), cex=0.6, (0:4))
# Plot symbols 5-9 with labels
points(1:5, rep(4,5), cex=2, pch=(5:9))
text((1:5)+0.4, rep(4,5), cex=0.6, (5:9))
# Plot symbols 10-14 with labels
points(1:5, rep(3,5), cex=2, pch=(10:14))
text((1:5)+0.4, rep(3,5), cex=0.6, (10:14))
# Plot symbols 15-19 with labels
points(1:5, rep(2,5), cex=2, pch=(15:19))
text((1:5)+0.4, rep(2,5), cex=0.6, (15:19))
# Plot symbols 20-25 with labels
points((1:6)*0.8+0.2, rep(1,6), cex=2, pch=(20:25))
text((1:6)*0.8+0.5, rep(1,6), cex=0.6, (20:25))
```


0
1
2
3
4
0
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
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17
18
19
20
21
22
23
24
25
0
1
2
3
4
5
6
7
1
2
3
4
5