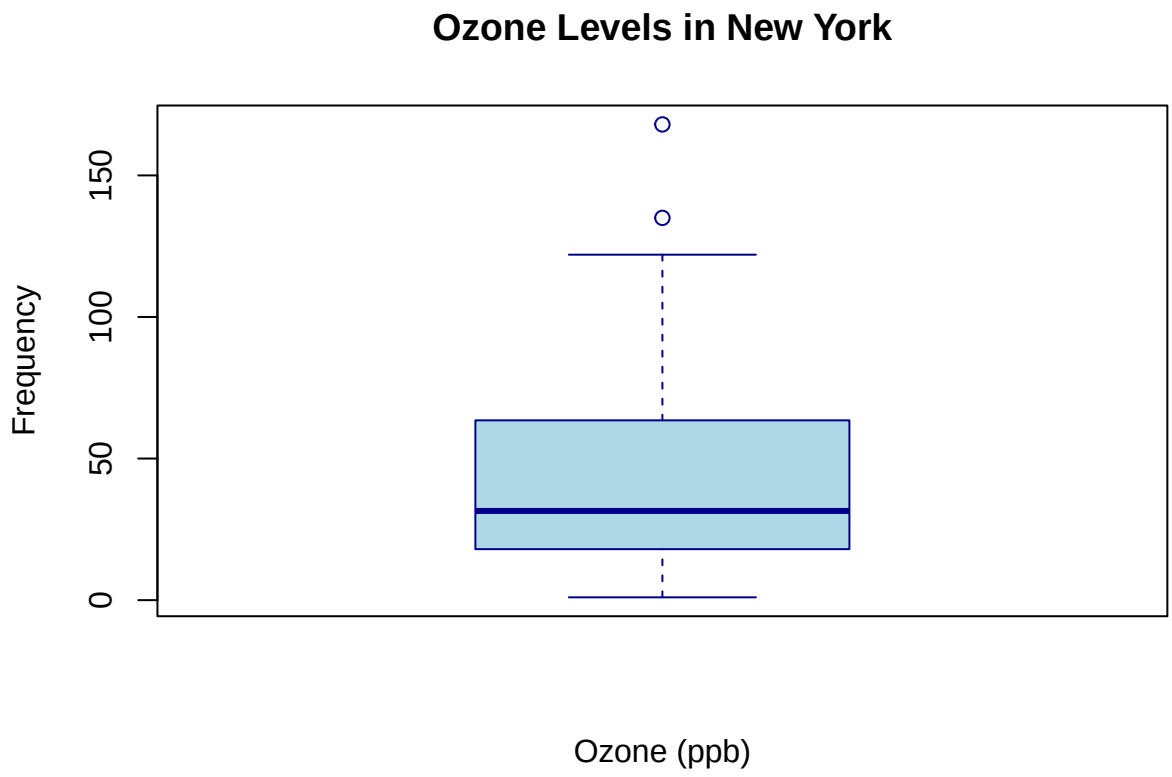
Basic Plotting

Box Plot

A box plot (or box-and-whisker plot) is a graphical representation of data that shows the distribution through their quartiles.It highlights the median quartiles, and potential outliers in the data.

```r
# Load the dataset
data("airquality")

# Create a box plot for the Ozone column
boxplot(airquality$Ozone,
        main = "Ozone Levels in New York",
        xlab = "Ozone (ppb)",
        ylab = "Frequency",
        col = "lightblue",
        border = "darkblue")
```



Components of a Box Plot are as follows:

1. Median (Q2): The line inside the box.
2. First Quartile (Q1): The lower edge of the box.
3. Third Quartile (Q3): The upper edge of the box.
4. Interquartile Range (IQR): The distance between Q1 and Q3.
5. Whiskers: Lines extending from the box to the smallest and largest values within 1.5 * IQR from Q1 and Q3.
6. Outliers: Points outside the whiskers. # Multiple Box Plots

You can also create multiple box plots in a single plot by passing a list or data frame:

```
# Multiple box plots
boxplot(airquality$Ozone, airquality$Temp,
          names = c("Ozone", "Temperature"),
          main = "Ozone and Temperature Levels",
          col = c("lightblue", "lightgreen"))
```

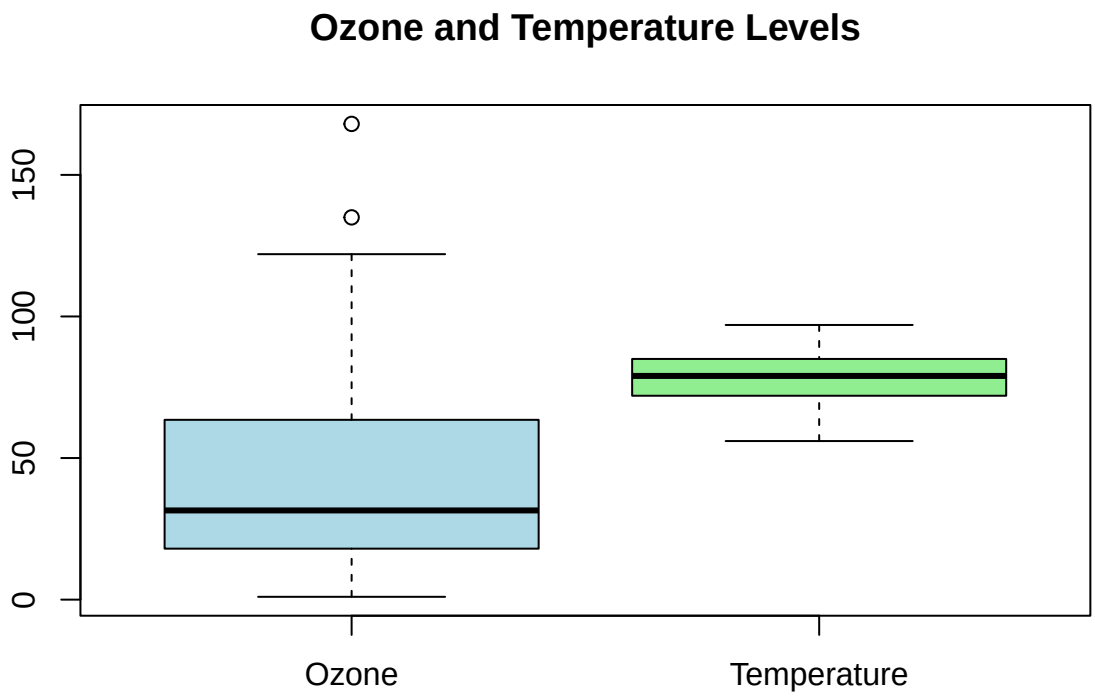


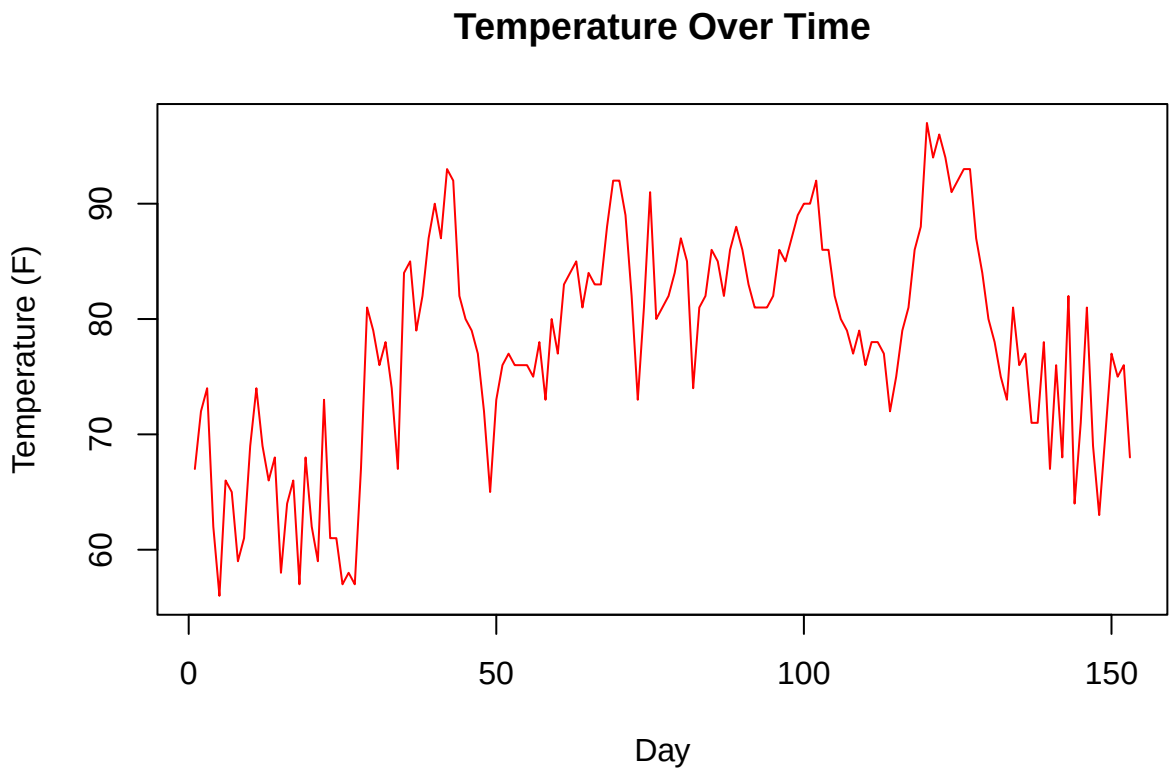
Chart Plot

The term "chart plot" can refer to various types of plots in R, such as line plots, bar plots, scatter plots, etc. Here are a few common types:

1. **Line Plot**

A line plot is useful for visualizing data points connected by straight lines, often used for time series data.

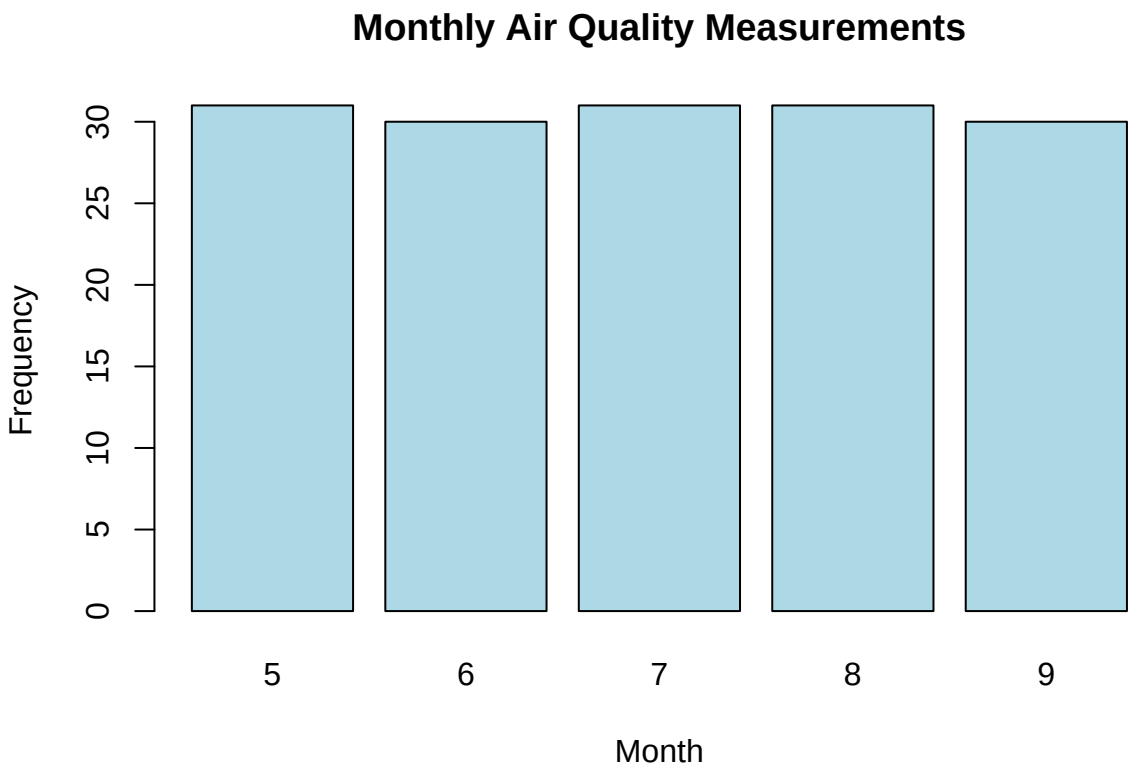
```r
plot(airquality$Temp, type = "l",
     main = "Temperature Over Time",
     xlab = "Day",
     ylab = "Temperature (F)",
     col = "red")
```



2. **Bar Plot**

A bar plot displays data with rectangular bars, where the length of each bar is proportional to the value it represents.

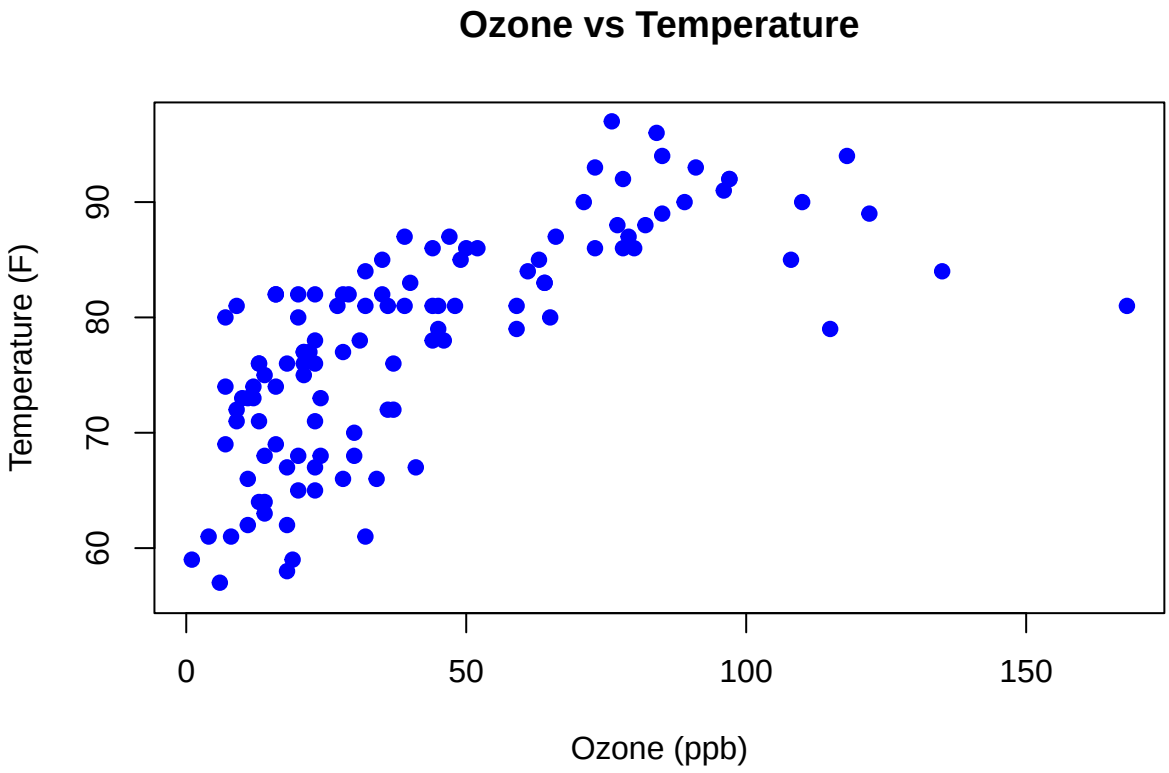
```r
barplot(table(airquality$Month),
        main = "Monthly Air Quality Measurements",
        xlab = "Month",
        ylab = "Frequency",
        col = "lightblue")
```



3. **Scatter Plot**

A scatter plot shows the relationship between two continuous variables.

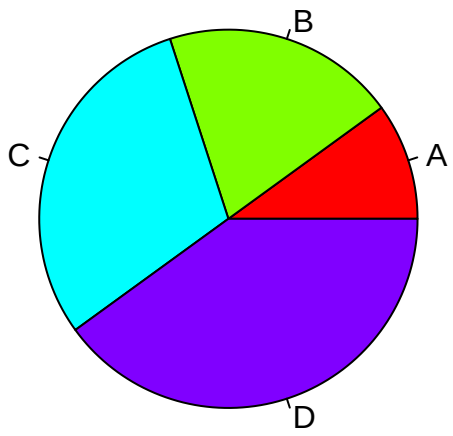
```
plot(airquality$Ozone, airquality$Temp,
     main = "Ozone vs Temperature",
     xlab = "Ozone (ppb)",
     ylab = "Temperature (F)",
     col = "blue",
     pch = 19)
```



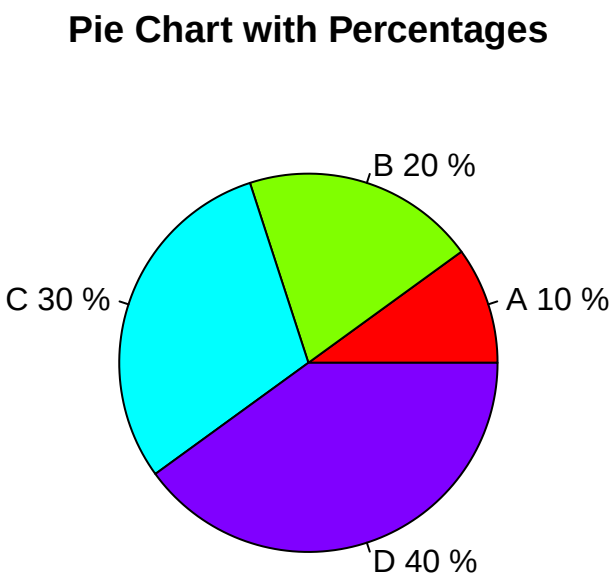
Pie Chart

A pie chart is a circular chart divided into sectors, each representing a proportion of the whole.

```
# Sample data
slices <- c(10, 20, 30, 40)
labels <- c("A", "B", "C", "D")

# Create pie chart
pie(slices, labels = labels, main = "Pie Chart Example",
    col = rainbow(length(slices)))
```



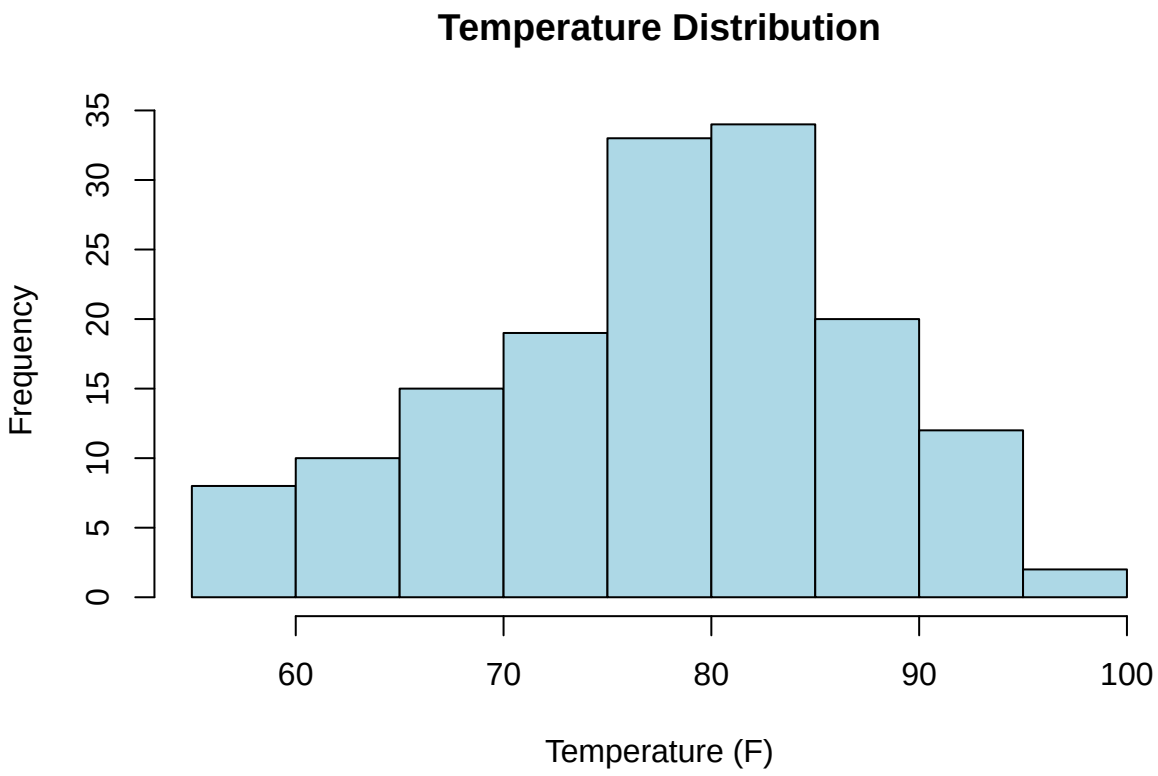

```r
# Customizing a Pie Chart

# Adding percentages
percentages <- round(slices / sum(slices) * 100)
labels <- paste(labels, percentages, "%", sep = " ")

# Create pie chart with percentages
pie(slices, labels = labels, main = "Pie Chart with Percentages",
    col = rainbow(length(slices)))
```



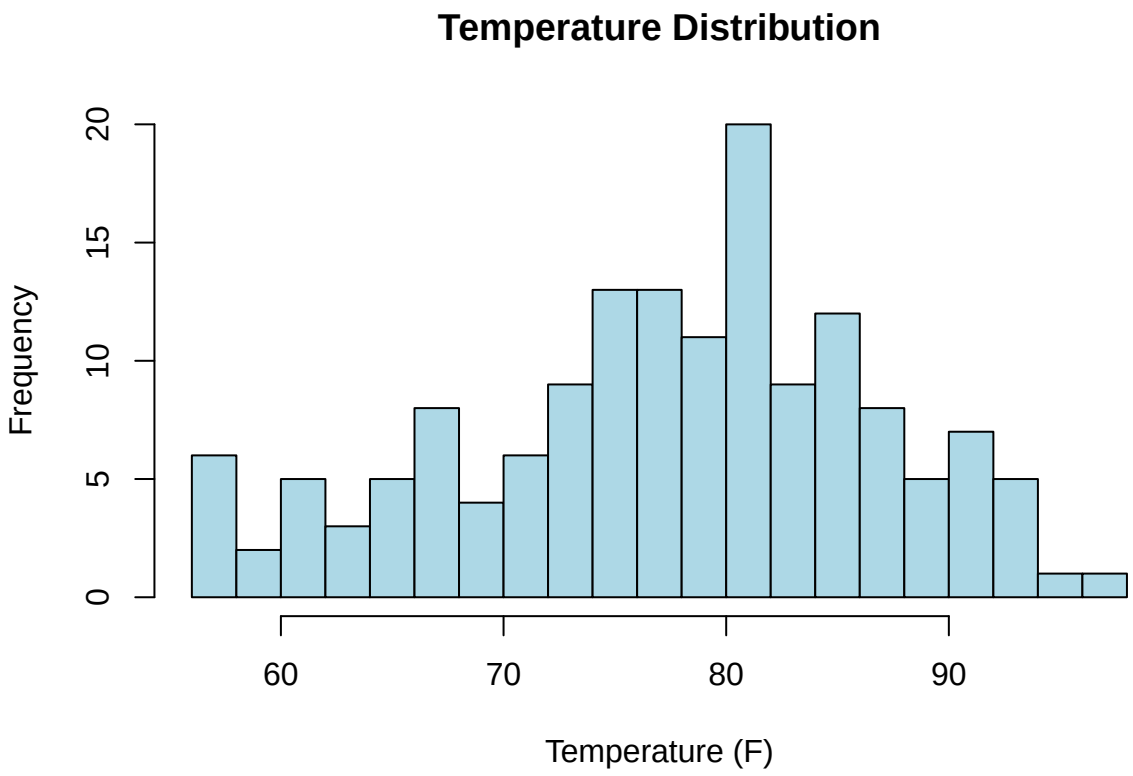
Histogram

A histogram is used to visualize the distribution of a dataset by dividing it into bins and counting the number of observations in each bin.

```
# Load the dataset
data("airquality")

# Create a histogram for the Temperature column
hist(airquality$Temp, main = "Temperature Distribution",
     xlab = "Temperature (F)", col = "lightblue",
     border = "black")
```



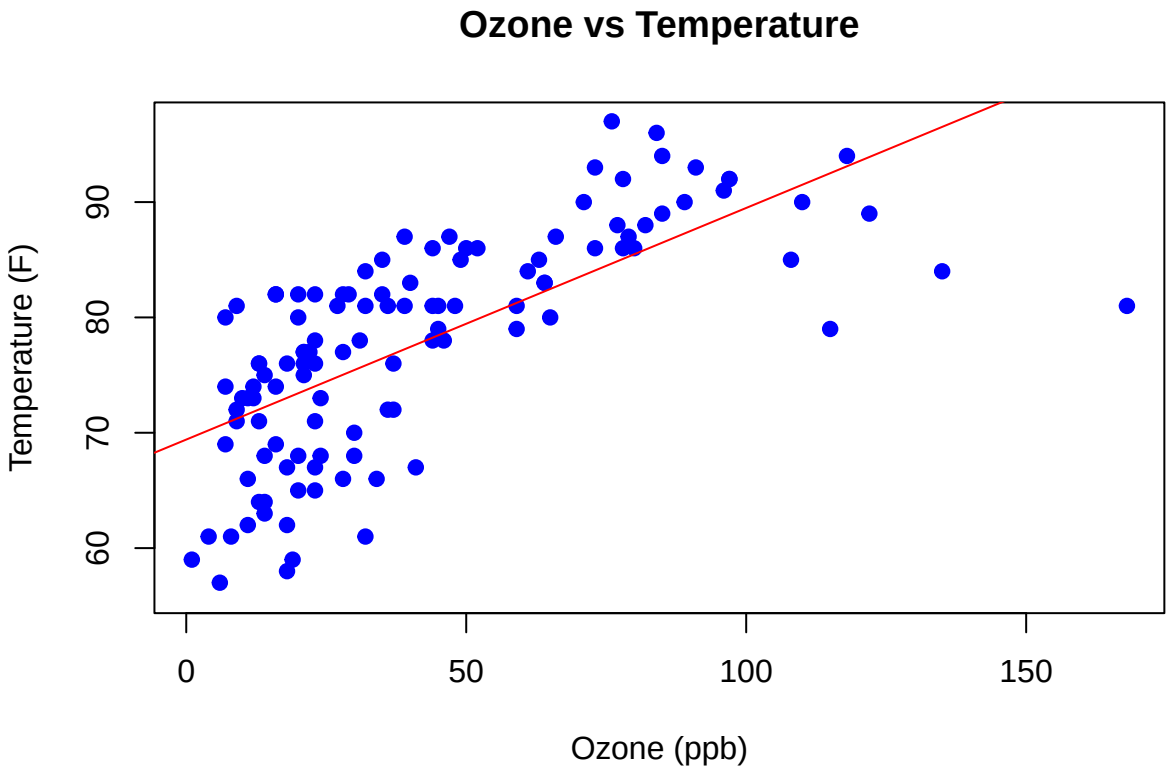

```r
# Customizing the histogram

hist(airquality$Temp, breaks = 15,
     main = "Temperature Distribution",
     xlab = "Temperature (F)",
     col = "lightblue",
     border = "black")
```



Scatter Plot

A scatter plot displays the relationship between two continuous variables.You can add a regression line to the scatter plot to visualize the trend:

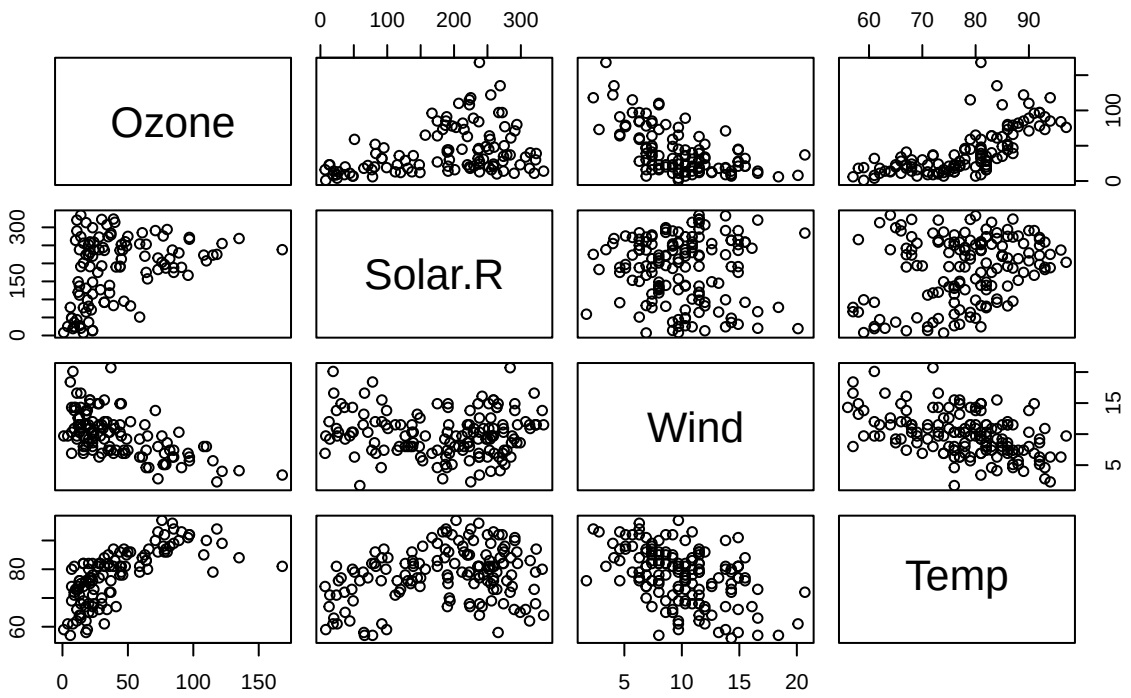
```
# Scatter plot of Ozone vs Temperature
plot(airquality$Ozone, airquality$Temp,
     main = "Ozone vs Temperature",
     xlab = "Ozone (ppb)",
     ylab = "Temperature (F)",
     col = "blue",
     pch = 19)

# Add a regression line
abline(lm(Temp ~ Ozone, data = airquality), col = "red")
```



Matrix Plots

A matrix plot (or scatterplot matrix) shows pairwise relationships between multiple variables in a dataset.

```
# Using base R
pairs(airquality[, 1:4], main = "Scatterplot Matrix")
```


Scatterplot Matrix
Ozone
Solar.R
Wind
Temp
0
100
200
300
60
70
80
90
0
100
0
150
300
5
15
60
80
0
50
100
150
5
10
15
20