An Introduction to Data Visualization and Summary Statistics

Data visualization and summary statistics are an important part of statistical analysis. It can help you identify trends in your data and communicate your research in presentations. Here are some recommendations of plots and descriptive statistics you can use, based on the type of data you have.
Examples of all of the charts and graphs mentioned are listed at the end.

Continuous Numeric Data:

When your data is a set of numbers between a range. The data can take any value over that interval. If the interval is 1-10, then the data can take values of 2, 3.4, 7.6, .391234 and so on.

Appropriate charts: Histograms, box plots
Appropriate descriptive statistics: Mean, Standard Deviation or Variance, Range (Maximum/Minimum), Median (more appropriate skewed data)

Nominal Categorical Data:

Is when your data fits into categories without ranks, for example: 'Red', 'Green', 'Blue', or 'yes'/'no'. While the colors or response are different Red is not higher or lower than Green.

Appropriate charts: Bar charts
Appropriate descriptive statistics: Frequency table, mode

Ordinal Categorical Data:

This is when you have data that has distinct categories, that have an order to them, like 'low, 'medium', 'high' setting on a machine or '3 months', '4 months', '5 months' as distinct time units. Months could be Continuous if you were measuring time of survival in Months, but you could have them set, for example, as Month on a treatment, then they would be Ordinal.

Appropriate charts: Bar charts
Appropriate descriptive statistics: Frequency table, Median, 1st and 3rd Quartile

Relationship between 2 continuous variables:
Appropriate charts: Scatterplot
Appropriate descriptive statistics: Correlation

Relationship between 2 ordinal or nominal variables:

Appropriate charts: Grouped Barcharts,
Side by Side Barcharts
Appropriate descriptive statistics: Crosstabs
Relationship between 1 ordinal or nominal variable and 1 continuous variable:

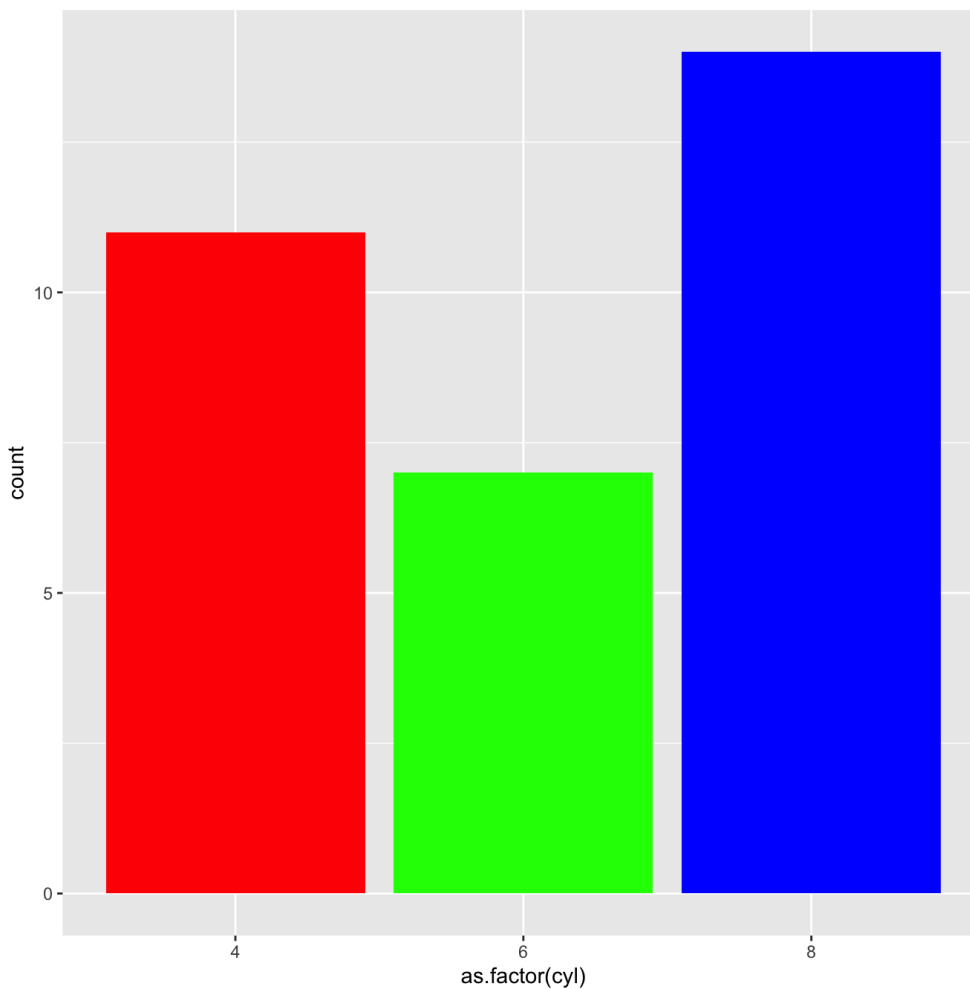Appropriate charts: Side by Side Boxplots,
Stacked or Side by Side Histograms.
Appropriate descriptive statistics:
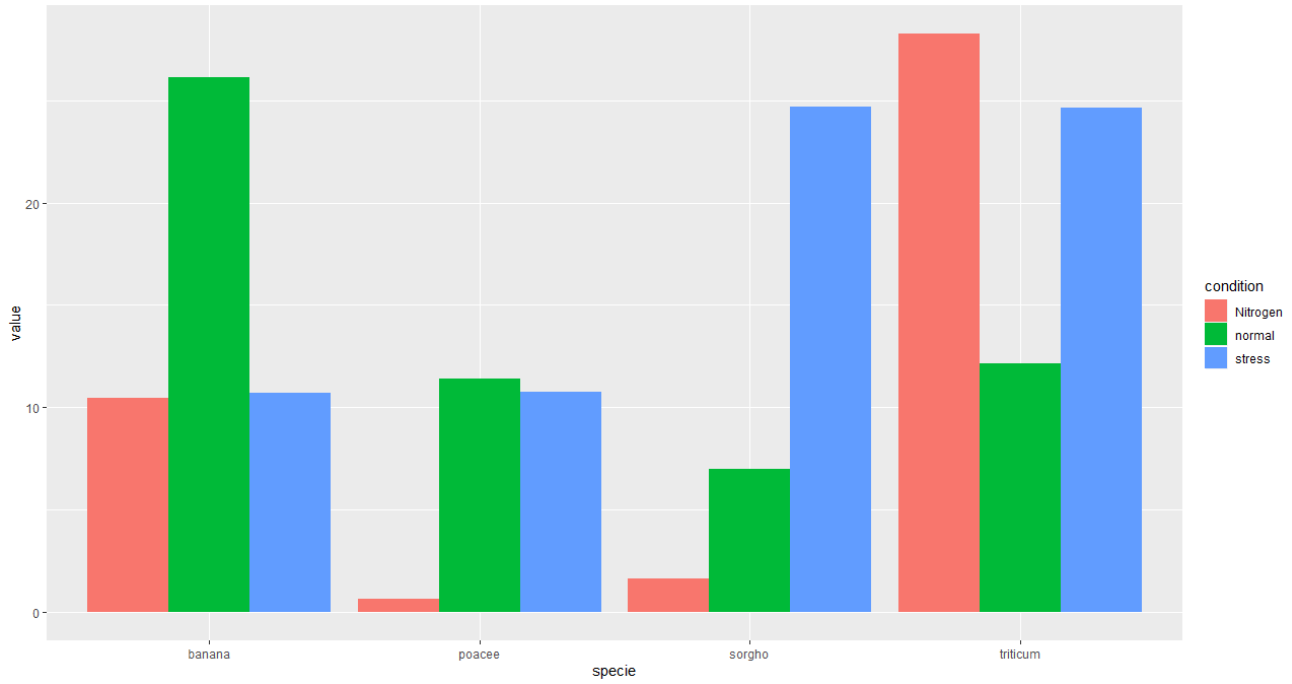Grouped means and standard deviations.

Examples of Charts and Graphs:

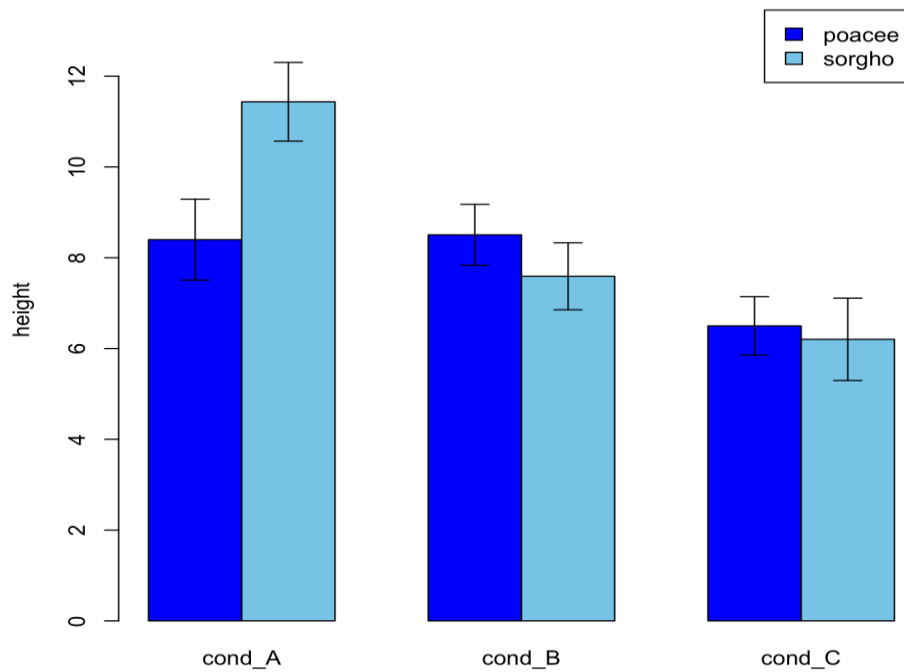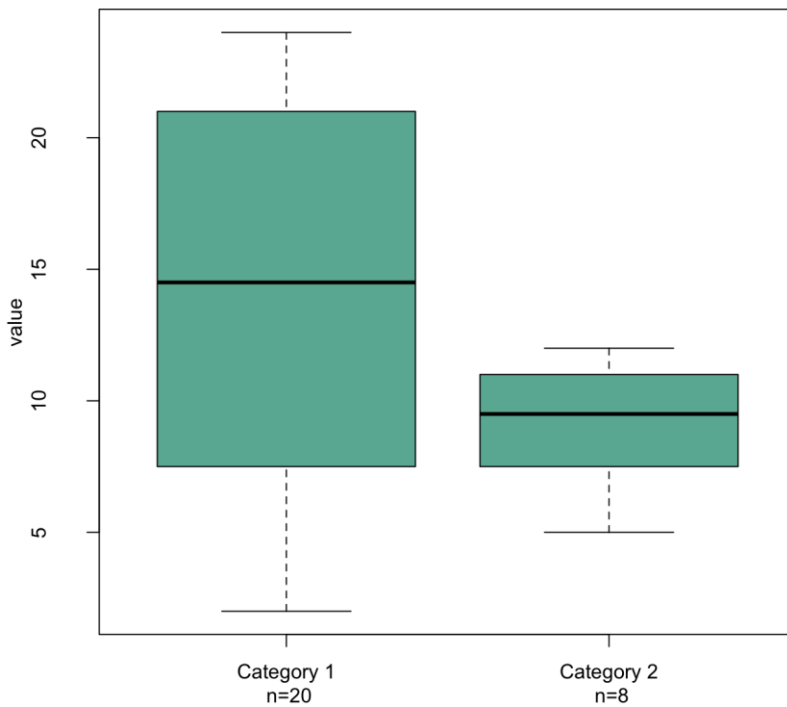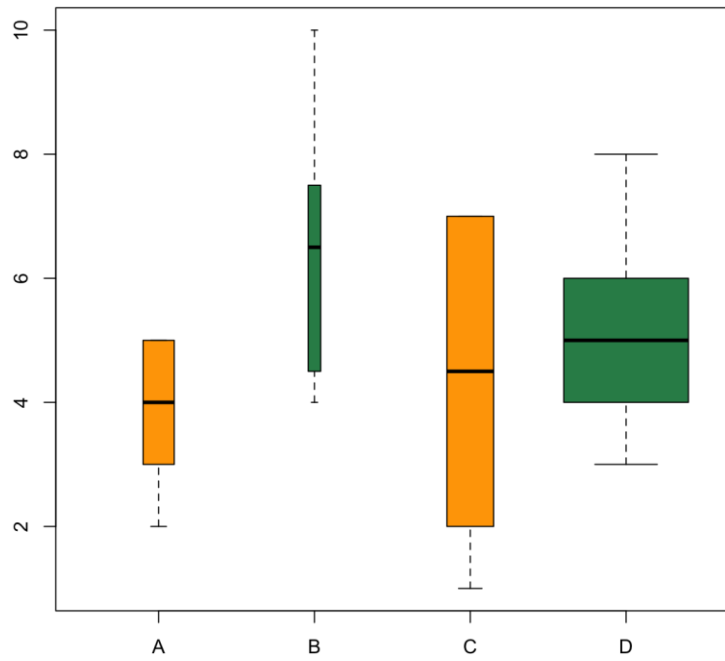**Barchart**

Grouped Barcharts

Side by Side Barchart

Crosstabs Table:

Age		Unlisted phone number		
		No	Yes	NET
18-34	% within column	24%	49%	29%
	n	185	90	275
35-44	% within column	20%	26%	21%
	n	153	48	201
45-54	% within column	17%	10%	16%
	n	133	19	152
55-64	% within column	17%	11%	16%
	n	130	21	151
65+	% within column	23%	3%	19%
	n	178	6	184
NET	% within column	100%	100%	100%
	n	779	184	963

Box Plots

Side by Side Box Plots

Histogram

value of the variable

Side by Side Histograms
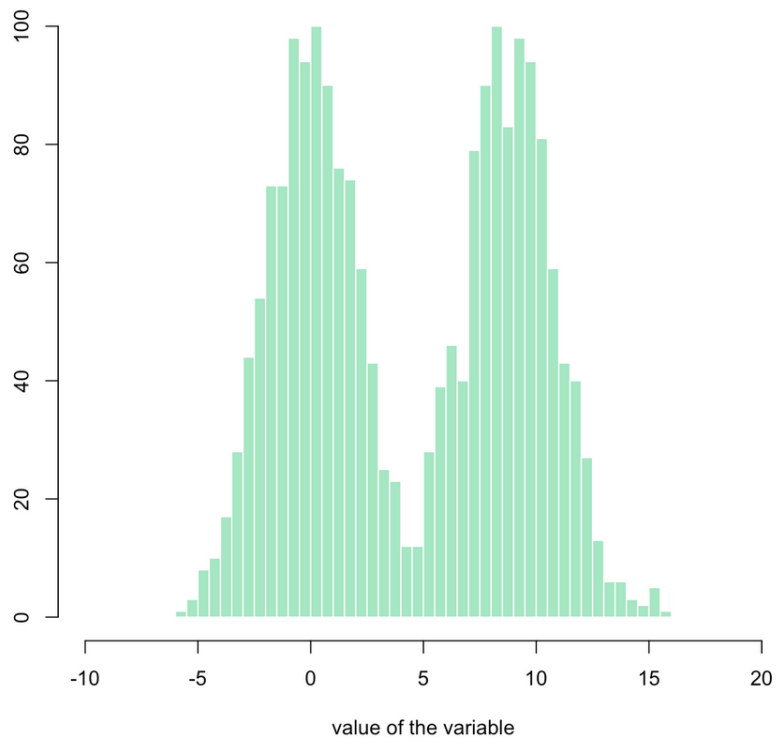
distribution of height of 2 durum wheat varieties
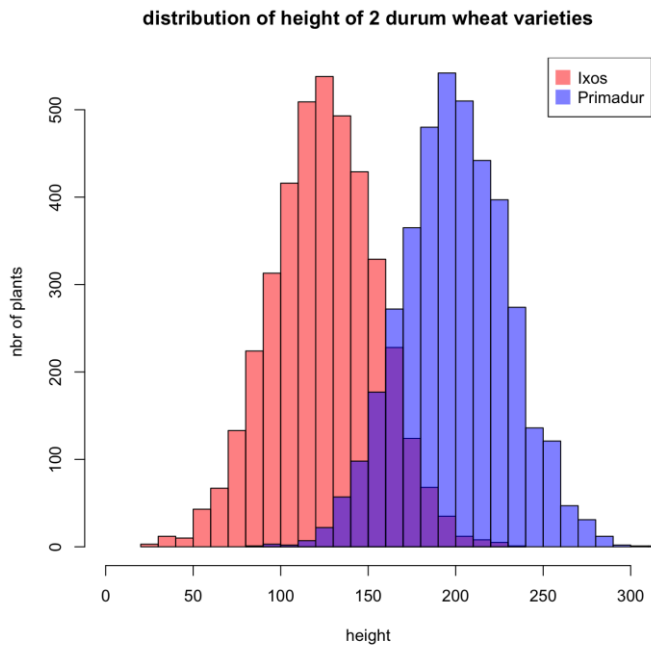
Stacked Barcharts
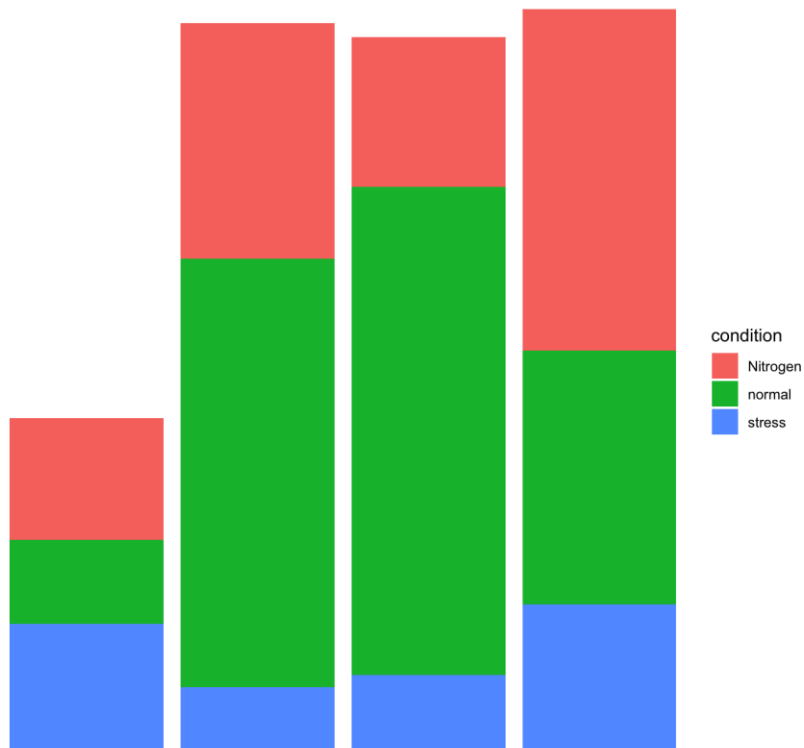
Scatterplot

All graphs taken from: https://www.r-graph-gallery.com/all-graphs.html
Cross tabs example from https://www.displayr.com/what-is-a-crosstab/