The program may be used as a regular calculator.

- + to add
- - to subtract
- * to multiply
- / to divide
- ^ to raise to a power
- sqrt to square root; any other root, use a fractional exponent

To enter a data set
- c()

The cursor will then appear inside the parenthesis and you’ll enter the data set, separating each number with a comma. Lastly, hit enter.

Name a data set
- name=c()

Mean of a data set
- mean(name of data set) or mean(enter the data set)

Median of a data set
- median(name of data set) or median(enter the data set)

Sort data
- sort(name of data set) or sort(enter the data set)

Variance of a data set
- var(name of data set) or var(enter the data set)

Standard Deviation of a data set
- sd(name of data set) or sd(enter the data set)

Five Number Summary
- fivenum(name of data set) or fivenum(enter data set)

Factorial
- factorial(number)

For permutations, use the factorial command.

Combination
- choose(n,r)

Binomial Distributions
- \( P(X = k) = \text{dbinom}(k, n, p) \)
- \( P(X \leq k) = \text{pbinom}(k, n, p) \)
- \( P(X > k) = 1 - \text{pbinom}(k, n, p) \)

In the command, \( n \) = number of trials, \( k \) = number of successes and \( p \) = probability of success

Geometric Distributions
- \( P(X = n) = \text{dgeom}(n - 1, p) \)
- \( P(X \leq n) = \text{pgeom}(n - 1, p) \)
- \( P(X > n) = 1 - \text{pgeom}(n - 1, p) \)

where \( n \) = nth trial and \( p \) = probability of success

Normal Distributions
- \( P(X < b) = \text{pnorm}(b, \mu, \sigma) \)
- \( P(X > a) = 1 - \text{pnorm}(a, \mu, \sigma) \)
- \( P(a < X < b) = \text{pnorm}(b, \mu, \sigma) - \text{pnorm}(a, \mu, \sigma) \)

If the random variable is the standard normal variable, then leave \( \mu \) and \( \sigma \) blank.
• \( P(X < c) = p \), command: `qnorm(p, \mu, \sigma)`
• \( P(X > c) = p \), command: `qnorm(1 - p, \mu, \sigma)`
• \( P(-c < X < c) = p \), command: `qnorm((p+1)/2, \mu, \sigma)`

If the random variable is the standard normal variable, then leave \( \mu \) and \( \sigma \) blank.

Correlation
• \( \text{cor}(x, y) \).

Coefficient of Determination
• \( \text{cor}(x, y)^2 \)

Least Square Regression Line (LSRL)
• `lm(y ~ x)`

Residuals of the LSRL
• `resid(lm(y ~ x))`

Draw the LSRL through the scatterplot
• `abline(lm(time ~ age))`

Draw a horizontal line at 0 through the residual plot
• `abline(0, 0)`

N random integers from a to b
• `sample(a:b, N)`

Scatterplot
• `plot(name of x data set, name of y data set, pch=16, cex=2, cex.lab=2, cex.axis=2)`

In the command, `pch = 16` for filled dots, `cex = 2` for larger dots, `cex.lab = 2` for larger labels, and `cex.axis = 2` for larger tickmarks

\[ z^* = qnorm\left(\frac{1 + \text{confidence level}}{2}\right) \]
• `qnorm(area to the left) = critical value for the z-distribution`
• `pnorm(z) = area to the left`
• `1 - pnorm(z) = area to the right`

\[ t^* = \frac{1 + \text{CL}}{2} \]
• `qt(area to the left, df) = critical value for the t-distribution`
• `pt(t, df) = area to the left`
• `1 - pt(t, df) = area to the right`
Graphs

- `barplot(name of data set, names.arg=c("name of first bar", "name of second bar", etc))`

- `pie(name of data set, labels=c("name of first section", "name of second section", etc))`

- `stripchart(name of data set, method="stack", pch=16, cex=2, offset=1)`

  *This command gives a dot plot.*

  *In the command, pch = 16 for filled dots, cex = 2 for larger dots and offset for spacing out dots.*

- `stem(name of data set)`

- `hist(name of data set)`

- `boxplot(name of data set, horizontal=TRUE)`

  *In the command, horizontal=TRUE for a horizontal boxplot.*

  *The word true must be capitalized.*