

Calculations and Built-in Functions in R

1, 2, 3, 4, 5 } mean?

$$> (1+2+3+4+5)/5$$

 $> \text{mean}()$ # mean $> \text{var}()$ # variance $> \text{sd}()$ # st. deviation

R-case sensitive)

any other function names different than the predefined functions will not work!
Remember the correct function name!

* Missing values! NA, NaN, Inf

R is a functional calculator!

Example:

$$\lim_{n \rightarrow \infty} \sqrt{\sum_{i=1}^n \frac{6}{i^2}} = \pi$$

for $n=100$,
 $\rightarrow 1000$,
 $\rightarrow 10.000$,
 $\rightarrow 100.000$

Annotations: \sum is labeled 'sum()', $\sqrt{\quad}$ is labeled 'sqrt()', and the entire expression is labeled 'n'.

$$\left(\frac{6}{1^2} + \frac{6}{2^2} + \frac{6}{3^2} + \dots + \frac{6}{100^2} \right)$$

$\Sigma \dots$
 $\sqrt{\Sigma \dots}$

1. step. \leftarrow 2. step. \leftarrow 3. step. \leftarrow

1. $6 / (1:100)^2$ $\rightarrow i=1, \dots, 100$

2. $\text{sum}(6 / (1:100)^2)$

3. $\text{sqrt}(\text{sum}(6 / (1:100)^2))$ \rightarrow returns a single value

$$\frac{9}{6}$$

\rightarrow numerator
 \rightarrow denominator

4. rerun the command for every new value of n.

(the app. π constant can be obtained by values of n.)b) $i=1, \dots, 1000$ c) $i=1, \dots, 10000$ d) $i=1, \dots, 100000$ 5. The most app value is achieved when $n=100000$