How to Calculate Mean of a Vector in R programming

Calculate mean of a vector in R

In this tutorial, we shall learn to calculate mean of a vector in R

- Calculate mean of a vector
  - Syntax of mean() function
- Examples
  - Mean of numeric vector
  - Mean of numeric vector with trim=0.1
  - Mean of numeric vector with na.rm=TRUE
  - Mean of numeric vector with na.rm=FALSE
  - Mean of logical vector

Mean of a vector

Mean of a vector is the average or arithmetic mean of elements in the vector. A built-in function called mean() is used to calculate mean of a vector in R programming language.

Syntax of mean() in R

```
mean(x, trim=0, na.rm = FALSE, ...)
```

where

- `x` could be numeric vector / logical vector / data object / date-time object / time interval. Also `x` could be complex vector provided time=0.
- `trim` range is [0, 0.5]. It is the fraction of elements that would be dropped before calculating mean. trim=0.2 means 20% of elements at the beginning and 20% of the elements at the ending of the vector are removed, and the mean is calculated for the 60% of elements remaining.
- `na.rm` mean NA REMoval. It could be TRUE or FALSE. If TRUE, NA values in vector would be stripped out before mean computation proceeds.

Examples to Calculate mean of a vector in R

We shall learn to calculate mean with different options available with mean() function.

Simple Example with mean() function applied on numeric vector

Mean of numeric vector

```
x = c(1,2,3,4,5,6,7,8,9,45)
xm = mean(x)
```

```
\[
x = c(1,2,3,4,5,6,7,8,9,45) \\
xm = \text{mean}(x) \\
c(xm)
\]

Output

\[
[1] 5
\]

\[
[1] 5
\]

\[
xm = (1+2+3+4+5+6+7+8+9+45)/9 = 90/10 = 9
\]

Example with \text{trim} attribute in \text{mean()} function applied on numeric vector

Mean of vector with \text{trim}=0.10

\[
x = c(1,2,3,4,5,6,7,8,9,45)
\]

\[
x = c(1,2,3,4,5,6,7,8,9,45) \\
xm = \text{mean}(x, \text{trim}=0.10) \\
c(xm)
\]

Output

\[
[1] 5.5
\]

\[
[1] 5.5
\]

\[
\text{trim}=0.10 \ i.e., \ 10\% \ of \ elements \ at \ starting \ and \ ending \ are \ removed. \ 1 \ and \ 45 \ are \ removed \ and \ the \ mean \ is \ calculated \ with \ rest \ of \ elements \ in \ the \ vector.
\]

\[
xm = (2+3+4+5+6+7+8+9)/9 = 44/8 = 5.5
\]

Example with \text{na.rm=}TRUE in \text{mean()} function applied on numeric vector

Mean of numeric vector with \text{na.rm=}TRUE

\[
x = c(1,2,3,4,5,6,7,8,9,45,\text{NA})
\]

\[
x = c(1,2,3,4,5,6,7,8,9,45,\text{NA}) \\
xm = \text{mean}(x, \text{trim}=0.0, \text{na.rm=}\text{TRUE}) \\
c(xm)
\]

Output
na.rm = TRUE removes all the NA values present in vector before calculation proceeds. 

\[ \text{xm} = \frac{(2+3+4+5+6+7+8+9+45)}{9} = \frac{44}{8} = 5.5 \]

**Example with na.rm=FALSE in mean() function applied on numeric vector**

Mean of numeric vector with na.rm=FALSE

\[
x = c(1,2,3,4,5,6,7,8,9,45,\text{NA})
\]

\[
xm = \text{mean}(x, \text{trim}=0.0, \text{na.rm}=\text{TRUE})
\]

\[
xm
\]

Output

\[ [1] \text{NA} \]

na.rm = FALSE does not remove NA values present in vector before calculation proceeds. And if NA is present in the vector, mean would be NA irrespective of anything else.

\[
xm = \frac{(1+2+3+4+5+6+7+8+9+45+\text{NA})}{9} = \text{NA} \]

If NA s are expected in a vector, na.rm has to be considered.

**Simple Example with mean() function applied on logical vector**

Mean of logical vector

\[
x = c(\text{TRUE}, \text{FALSE}, \text{FALSE}, \text{FALSE}, \text{TRUE})
\]

\[
xm = \text{mean}(x)
\]

\[
xm
\]

Output

\[ [1] 0.4 \]
For a logical vector, TRUE is considered as 1 and FALSE is considered as 0.

\[ \text{xm} = \frac{\text{TRUE} + \text{FALSE} + \text{FALSE} + \text{FALSE} + \text{TRUE}}{5} = \frac{1+0+0+0+1}{5} = \frac{2}{5} = 0.4 \]

**Conclusion:**

In this R Tutorial, we have learnt about mean() function and how to Calculate Mean of a Vector in R with Example R Scripts.
Extract Substring from a String in R
Concatenate two or more Strings in R

Functions

R Functions

DataFrame

R Data Frame
Sort R Data Frame by Column
For each row in an R Data Frame
Import Excel Data into R Dataframe
Convert R Dataframe to Matrix
R Dataframe - Delete Rows
R Dataframe - Drop Columns
R Dataframe - Add Column
R Dataframe - Change Column Name
R Dataframe - Remove Duplicate Rows
R Dataframe - Replace NA with 0
Convert Matrix to R Dataframe

Handling Data from Files

R CSV Files - Read, Filter, Write
R Read Excel XLS XLSX files

Charts & Graphs

R Pie Charts
R Line Graphs

Statistical Analysis

R Mean of a Vector
R Median of a Vector