

What is the ties.method in the rank function and how does it work?

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The ties.method in the rank function is a method used to handle ties or equal values when ranking a set of data. It determines how to assign ranks to values that have the same numerical value. This method works by first sorting the data in ascending order and then assigning ranks based on the specified ties.method. There are various types of ties.method such as "average", which assigns the average rank to tied values, and "min", which assigns the minimum rank to tied values. This method is useful in situations where there are multiple identical values in a dataset and an accurate ranking is needed.

R: A Complete Guide to ties.method in rank Function

You can use the rank() function in base R to return a rank of values in a vector.

This function uses the following basic syntax:

```
rank(x, na.last=TRUE, ties.method="average")
```

where:

x: The vector that contains the values to rank
na.last: If TRUE, missing values are put last. If FALSE, missing values are put first.
ties.method: How to handle ties (default is "average")

The ties.method argument within the rank() function specifies how ties should be handled.

This argument accepts the following options:

average: (Default) Assigns each tied element to the average rank (elements ranked in the 3rd and 4th position would both receive a rank of 3.5)
first: Assigns the first tied element to the lowest rank (elements ranked in the 3rd and 4th positions would receive ranks 3 and 4 respectively)
last: Assigns the last tied element to the lowest rank (elements ranked in the 3rd and 4th positions would receive ranks 4 and 3 respectively)
min: Assigns every tied element to the lowest rank (elements ranked in the 3rd and 4th position would both receive a rank of 3)
max: Assigns every tied element to the highest rank (elements ranked in the 3rd and 4th position would both receive a rank of 4)
random: Assigns every tied element to a random rank (either element tied for the 3rd and 4th position could receive either rank)

The following examples show how to use each option in practice with the following data frame in R:

```
#create data frame  
df <- data.frame(player=c('A', 'B', 'C', 'D', 'E'),  
points=c(5, 8, 10, 10, 17))
```

```
#view data frame
```

df

player points

1 A 5

2 B 8

3 C 10

4 D 10

5 E 17

Example 1: Use rank() with ties.method="average"

The following code shows how to create a new column that uses rank() with ties.method="average" to assign a rank to each player based on the value in the points column:

#create new column that ranks players based on their points value

```
df$points_rank = rank(df$points,  
ties.method="average")
```

#view updated data frame

df

player points points_rank

1 A 5 1.0

2 B 8 2.0
3 C 10 3.5
4 D 10 3.5
5 E 17 5.0

Since players C and D had the same number of points and were in rank positions 3 and 4, they both received the average of their rankings: 3.5.

Example 2: Use rank() with ties.method="first"

The following code shows how to create a new column that uses rank() with ties.method="first" to assign a rank to each player based on the value in the points column:

```
#create new column that ranks players based on their  
points value
```

```
df$points_rank = rank(df$points, ties.method="first")
```

```
#view updated data frame
```

```
df
```

```
player points points_rank
```

```
1 A 5 1
```

```
2 B 8 2
```

3 C 10 3

4 D 10 4

5 E 17 5

Example 3: Use rank() with ties.method="last"

The following code shows how to create a new column that uses rank() with ties.method="last" to assign a rank to each player based on the value in the points column:

```
#create new column that ranks players based on their  
points value
```

```
df$points_rank = rank(df$points, ties.method="last")
```

```
#view updated data frame
```

```
df
```

```
player points points_rank
```

```
1 A 5 1
```

```
2 B 8 2
```

```
3 C 10 4
```

```
4 D 10 3
```

```
5 E 17 5
```

Since players C and D had the same number of points

and were in rank positions 3 and 4, the last player between these two (player "D") received the lower rank.

Example 4: Use rank() with ties.method="min"

The following code shows how to create a new column that uses rank() with ties.method="min" to assign a rank to each player based on the value in the points column:

```
#create new column that ranks players based on their  
points value
```

```
df$points_rank = rank(df$points, ties.method="min")
```

```
#view updated data frame
```

```
df
```

```
player points points_rank
```

```
1 A 5 1
```

```
2 B 8 2
```

```
3 C 10 3
```

```
4 D 10 3
```

```
5 E 17 5
```

Since players C and D had the same number of points and were in rank positions 3 and 4, both players

received the minimum rank: 3.

Example 5: Use rank() with ties.method="max"

The following code shows how to create a new column that uses rank() with ties.method="max" to assign a rank to each player based on the value in the points column:

```
#create new column that ranks players based on their points value
```

```
df$points_rank = rank(df$points, ties.method="max")
```

```
#view updated data frame
```

```
df
```

```
player points points_rank
```

```
1 A 5 1
```

```
2 B 8 2
```

```
3 C 10 4
```

```
4 D 10 4
```

```
5 E 17 5
```

Since players C and D had the same number of points and were in rank positions 3 and 4, both players received the maximum rank: 4.

Example 6: Use rank() with ties.method="random"

The following code shows how to create a new column that uses rank() with ties.method="random" to assign a rank to each player based on the value in the points column:

```
#create new column that ranks players based on their  
points value  
df$points_rank = rank(df$points,  
ties.method="random")
```

```
#view updated data frame  
df
```

```
player points points_rank  
1 A 5 1  
2 B 8 2  
3 C 10 4  
4 D 10 3  
5 E 17 5
```

Since players C and D had the same number of points and were in rank positions 3 and 4, each player was randomly assigned a rank of either 3 or 4.

Note that when you use "random" for the ties.method, the rank assigned to each value can change each time you run the code.

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