

Is there an easy way to calculate a Cumulative Average in R?

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Yes, calculating a cumulative average in R is a relatively easy task. This can be done by using the `cumsum()` and `length()` functions together to calculate the cumulative sum of a vector and then divide it by the length of the vector respectively. This will give you the cumulative average of the vector. Additionally, the more efficient `'reduce()'` function can be used to calculate the cumulative average in less time.

A **cumulative average** tells us the average of a series of values up to a certain point.

You can use the following methods to calculate the cumulative average of values in R:

Method 1: Use Base R

```
cum_avg <- cumsum(x) / seq_along(x)
```

Method 2: Use dplyr

```
library(dplyr)
```

```
cum_avg <- cummean(x)
```

Both methods return the exact same result, but the **dplyr** method tends to work faster on large data frames.

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

```
#create data frame
df <- data.frame(day=seq(1:16),
sales=c(3, 6, 0, 2, 4, 1, 0, 1, 4, 7, 3, 3, 8, 3, 5, 5))
```

```
#view head of data frame
head(df)
```

```
day sales
1 1 3
2 2 6
3 3 0
4 4 2
5 5 4
6 6 1
```

Example 1: Calculate Cumulative Average Using Base R

We can use the following code to add a new column to our data frame that shows the cumulative average of sales:

```
#add new column that contains cumulative avg. of sales
df$cum_avg_sales <- cumsum(df$sales) / seq_along(df$sales)
```

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

```
day sales cum_avg_sales
1 1 3 3.000000
2 2 6 4.500000
3 3 0 3.000000
4 4 2 2.750000
5 5 4 3.000000
6 6 1 2.666667
7 7 0 2.285714
8 8 1 2.125000
9 9 4 2.333333
10 10 7 2.800000
11 11 3 2.818182
12 12 3 2.833333
13 13 8 3.230769
14 14 3 3.214286
15 15 5 3.333333
16 16 5 3.437500
```

We would interpret the cumulative average values as:

The cumulative average of the first sales value is **3**.

The cumulative average of the first two sales values is **4.5**.

The cumulative average of the first three sales values is **3**.

The cumulative average of the first four sales values is **2.75**.

And so on.

Example 2: Calculate Cumulative Average Using dplyr

We can also use the **cummean** function from the package in R to calculate a cumulative average.

library(dplyr)

```
#add new column that contains cumulative avg. of sales
```

```
df$cum_avg_sales <- cummean(df$sales)
```

```
#view updated data frame
```

```
df
```

```
day sales cum_avg_sales
```

```
1 1 3 3.000000
```

```
2 2 6 4.500000
```

```
3 3 0 3.000000
```

```
4 4 2 2.750000
```

```
5 5 4 3.000000
```

```
6 6 1 2.666667
```

```
7 7 0 2.285714
```

```
8 8 1 2.125000
```

```
9 9 4 2.333333
```

```
10 10 7 2.800000
```

```
11 11 3 2.818182
```

```
12 12 3 2.833333
```

```
13 13 8 3.230769
```

```
14 14 3 3.214286
```

```
15 15 5 3.333333
```

```
16 16 5 3.437500
```

Notice that this method returns the exact same results as the previous method.

The following tutorials explain how to calculate other common metrics in R: