## Exercise 1

The cumsum function calculates the cumulative sum. It has a single argument x, which has to be either numeric or can be coerced to numeric (like boolean values) and returns a numeric vector of the same length as the first argument x. The first element of the return value is the first element of x. The second element is the sum of the first and second element of x. The third element is the sum of the first, second, and third element of x, etc. The cumulative sum of the first 12 natural numbers is

```
cumsum(1:12)
# [1] 1 3 6 10 15 21 28 36 45 55 66 78
```

From this, we can also extract the cumulative sums of all natural numbers < 12. The cumulative minimum of the given series of numbers is

```
cummin(c(10, 6, 3, 5, 2, 1, 8, 7, 4, 9))
# [1] 10 6 3 3 2 1 1 1 1 1
```

Note that you have to create a vector with the values by using c(). You can not pass the values like the following

```
cummin(10, 6, 3, 5, 2, 1, 8, 7, 4, 9)
# Error in cummin(10, 6, 3, 5, 2, 1, 8, 7, 4, 9): 10 arguments passed to 'cummin' which
requires 1
```

In this case we passed 10 vectors of length 1 to cumsum, which only takes one argument. If we are curious about what happens when be have special input, we can just test it (since R is interpreted). For instance, we could put an NA somewhere into the vector or sum up boolean values.

```
cummin(c(10, 6, 3, 5, 2, NA, 1, 8, 7, 4, 9))
# [1] 10 6 3 3 2 NA NA NA NA NA
cumsum(c(TRUE, TRUE, FALSE, FALSE, TRUE))
# [1] 1 2 2 2 3
```

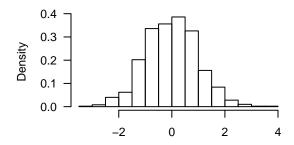
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## Exercise 2

The histogram can be created like to following. All arguments except las are explained on the help page for hist. Since las is not known to hist and hist has a ... argument, las = 1 goes into .... Everything that goes here will be passed to another function that sets the global parameters for graphical output. las = 1 for instance makes all tick labels horizontal.

```
hist(
    x = x,  # The first x is the argument name, the second x our vector.
    freq = FALSE,  # This plots the density instead of the f requencies/counts.
    xlab = "Standard normally distributed random numbers",
    ylab = "Density",
    main = "A Histogram of Random Numbers",
    las = 1
)
```

## A Histogram of Random Numbers



Standard normally distributed random numbers

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