Programmieren mit R: Seminararbeit 2

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1 Part I: *Functions* (15 points)

1.1 Functions I:

Define a function which given an atomic vector x as argument, returns x after removing missing values

```
dropNa <- function(x) {
  # takes an atomic vector as an argument and returns it without missing values
  x[!is.na(x)]
}
```

```
all.equal(dropNa(c(1, 2, 3, NA, 1, 2, 3)), c(1, 2, 3, 1, 2, 3))
```

```
## [1] TRUE
```

1.2 Functions II:

Part I: Write a function meanVarSdSe that takes a numeric vector x as argument. The function should return a named numeric vector that contains the mean, the variance, the standard deviation and the standard error of x.

```
meanVarSdSe <- function(x){
  # takes an numeric vector as argument and returns a named numeric vector
  # containing its mean, variance, standard deviation and standard error
  c(mean = mean(x),
    var = var(x),
    sd = sd(x),
    se = sd(x) / sqrt(length(x))
  )
}

# test
x <- 1:100
meanVarSdSe(x)
```

```
##       mean        var         sd         se
##  50.500000 841.666667  29.011492   2.901149
```

Part II: Look at the following code sequence. What result do you expect?

```
x <- c(NA, 1:100)
meanVarSdSe(x)
```

The code returns NA values for each statistic computed, which is the output of each function when using the default (FALSE) argument for `na.rm`.

```
meanVarSdSe <- function(x, ...){
  # computs mean, variance, standard deviation and standard error
  #
  # Args:
  #   x: a numeric vector
  #
  # Returns:
  #   mean, variance, standard deviation and standard error of input vector
  c(mean = mean(x, ...),
    var = var(x, ...),
    sd = sd(x, ...),
    se = sd(x, ...) / sqrt(length(which(!is.na(x))))
  )
}

# test
meanVarSdSe(x, na.rm = TRUE)
```

```
##       mean        var         sd         se
##  50.500000 841.666667  29.011492   2.901149
```

```
meanVarSdSe <- function(x){
  # computs mean, variance, standard deviation and standard error while using
  # dropNa function
  #
  # Args:
  #   x: a numeric vector
  #
  # Returns:
  #   mean, variance, standard deviation and standard error of input vector
  dropedNa <- dropNa(x)
  c(mean = mean(dropedNa),
    var = var(dropedNa),
    sd = sd(dropedNa),
    se = sd(dropedNa) / sqrt(length(dropedNa))
  )
}

# test
meanVarSdSe(c(x, NA))
```

```
##       mean        var         sd         se
##  50.500000 841.666667  29.011492   2.901149
```

1.3 Functions III:

Write an infix function %or% that behaves like the logical operator |

```
"%or%" <- function(x,y) {
  # logical operator OR... TO BE DONE...
}
```