task6_0930

2025-09-30

```
#task 6 R Functions 1
ratio_mean_median <- function(x, na.rm = TRUE, direction = c("mean/median", "median/mean")) {
  direction <- match.arg(direction)
  if (!is.numeric(x)) stop("x must be a given vector")
  if (na.rm) x <- x[!is.na(x)]
  if (length(x) == 0) stop("output is empty or NA")

  m  <- mean(x)
  md <- median(x)

  if (direction == "mean/median") {
    if (md == 0) return(NA_real_)  # or return(Inf)
    return(m / md)
  } else {
    if (m == 0) return(NA_real_)   # or return(Inf)
    return(md / m)
  }
}
## test in database of CO2 of uptake
data(CO2)
ratio_mean_median(CO2$uptake)
```

```
## [1] 0.9615935
```

```
ratio_mean_median(CO2$uptake, direction = "median/mean")
```

```
## [1] 1.039941
```

```r
#task 6 R Functions 2
mean_without_extremes <- function(x, na.rm = TRUE, mode = c("one", "all")) {
  if (!is.numeric(x)) stop("x must be numeric vector")
  if (na.rm) x <- x[!is.na(x)]
  if (length(x) < 3) stop("At least 3 numbers are needed to remove the minimum and maximum and
then find the average")

  mode <- match.arg(mode)

  if (mode == "one") {    # Remove only one minimum and one maximum value
    i_min <- which.min(x)
    i_max <- which.max(x)
    keep  <- setdiff(seq_along(x), c(i_min, i_max))
    return(mean(x[keep]))
  } else { # mode == "all"
    # Remove all elements equal to the minimum or maximum value
    mn <- min(x); mx <- max(x)
    keep <- (x != mn) & (x != mx)
    if (!any(keep)) stop("After removing all extreme values, there are no remaining elements a
nd the mean cannot be calculated.")
    return(mean(x[keep]))
  }
}

x1 <- c(1, 2, 3, 100)
mean_without_extremes(x1, mode = "one")  # Remove only one of 1 and 100 -> mean(2,3) = 2.5
```

```
## [1] 2.5
```

```r
x2 <- c(1, 1, 2, 3, 100, 100)
mean_without_extremes(x2, mode = "one")  # Only one 1 and one 100 are dropped
```

```
## [1] 26.5
```

```r
mean_without_extremes(x2, mode = "all")  # Drop all 1s and all 100s, leaving only 2,3 -> 2.5
```

```
## [1] 2.5
```

```r
#task 6 R Functions 3
##Why:pipesimprove_readabilityandreducenesting.How:chainstepswith|>(baseR)or%>%(magrittr);us
e'.'asplaceholderwhennotfirstarg.Whennot:verylongchains,branching,needintermediatechecks,heavy
side-effects,orenvironment-dependentfunctions(e.g.,assign/get)

#task 6 R Functions 4
#Applyfamilyfunctionsacceleratevectorizedrow/column,list,andgroupedops;theyreduceloops,lowerbu
grisk,improveclarity,andenablefastsummaries,featureengineering,andscalableresamplingacrossdata
sets;crucialforreproducibleRanalysisinSHMandbiomedicalstudies
```