Bootstrap difference in Medians

Code to demonstrate bootstrap difference in medians

17 June, 2017

```
  rm(list=ls())
 set.seed(123)
  startTime<-proc.time()
  library(knitr)
  options(width=120)
  opts_chunk$set(comment = "", warning = FALSE, message = FALSE,
                 echo = FALSE, tidy = FALSE, size="tiny",  cache=FALSE,
                 progress=TRUE, #results='hide',
                 fig.width=7, fig.height=3.5,
                 cache.path = 'program_Cache/',
                 fig.path='figure/')



  knitr::knit_hooks$set(inline = function(x) {
    knitr:::format_sci(x, 'md')
  })

  # create an R file of the code!

  # https://stackoverflow.com/questions/26048722/knitr-and-tangle-code-without-execution



   knit_hooks$set(purl = function(before, options) {
     if (before) return()
     input  = current_input()  # filename of input document
     output = paste(tools::file_path_sans_ext(input), 'R', sep = '.')
     if (knitr:::isFALSE(knitr:::.knitEnv$tangle.start)) {
     assign('tangle.start', TRUE, knitr:::.knitEnv)
     unlink(output)
   }

   cat(options$code, file = output, sep = '\n', append = TRUE)

   })



list.of.packages <- c("boot")  # haven causes a problem

new.packages <- list.of.packages[!(list.of.packages %in% installed.packages()[,"Package"])]

if(length(new.packages)) install.packages(new.packages)

sapply(X = list.of.packages, require, character.only = TRUE)
```

```
## Loading required package: boot
```

```
## boot
## TRUE
```

Bootstrap difference in medians

```
      set.seed(12434)

      x<-rnorm(70, 0, 5)
      y<-rnorm(130, 5 ,5)

      n1 <- length(x)
      n2 <- length(y)

      y1 <- c(x,y)

      group <- c(rep(1, each=n1),rep(2, each=n2))

      xx <- as.data.frame(cbind(group, y1))

      tapply(xx[,2], xx[,1], median, na.rm=T)  # check
```

```
        1         2
0.4342924 5.7275603
```

```
      bo <- boot(data=x,

      statistic = function(x, i) {

      booty <- tapply(xx$y, xx$group, FUN=function(x) X =sample(x,length(x),TRUE))
          diff(sapply(booty, median))
           },

      R=10000)

      boot.ci(bo)
```

```
BOOTSTRAP CONFIDENCE INTERVAL CALCULATIONS
Based on 10000 bootstrap replicates

CALL :
boot.ci(boot.out = bo)

Intervals :
Level      Normal              Basic
95%   ( 3.608,  6.217 )   ( 3.508,  6.240 )

Level     Percentile            BCa
95%   ( 3.859,  6.591 )   ( 3.504,  6.167 )
Calculations and Intervals on Original Scale
```

COMPUTING ENVIRONMENT

```
R version 3.3.2 (2016-10-31)
Platform: x86_64-w64-mingw32/x64 (64-bit)
Running under: Windows 10 x64 (build 14393)

locale:
[1] LC_COLLATE=English_United Kingdom.1252
[2] LC_CTYPE=English_United Kingdom.1252
[3] LC_MONETARY=English_United Kingdom.1252
[4] LC_NUMERIC=C
[5] LC_TIME=English_United Kingdom.1252

attached base packages:
[1] stats     graphics  grDevices utils     datasets  methods
[7] base

other attached packages:
[1] boot_1.3-18 knitr_1.16

loaded via a namespace (and not attached):
 [1] backports_1.1.0 magrittr_1.5    rprojroot_1.2   tools_3.3.2
 [5] htmltools_0.3.6 yaml_2.1.14     Rcpp_0.12.11    stringi_1.1.5
 [9] rmarkdown_1.5   stringr_1.2.0   digest_0.6.12   evaluate_0.10
```

This took 8.41 seconds to execute.