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| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| R version 3.6.1 (2019-07-05) -- "Action of the Toes"  Copyright (C) 2019 The R Foundation for Statistical Computing  Platform: x86\_64-w64-mingw32/x64 (64-bit)  R is free software and comes with ABSOLUTELY NO WARRANTY.  You are welcome to redistribute it under certain conditions.  Type 'license()' or 'licence()' for distribution details.  R is a collaborative project with many contributors.  Type 'contributors()' for more information and  'citation()' on how to cite R or R packages in publications.  Type 'demo()' for some demos, 'help()' for on-line help, or  'help.start()' for an HTML browser interface to help.  Type 'q()' to quit R.  [Workspace loaded from ~/.RData]  > archive=read.csv("avg\_fit.csv",header=T);  Error in file(file, "rt") : cannot open the connection  In addition: Warning message:  In file(file, "rt") :  cannot open file 'avg\_fit.csv': No such file or directory  > archive=read.csv("avg\_fit.csv",header=T);  Error in file(file, "rt") : cannot open the connection  In addition: Warning message:  In file(file, "rt") :  cannot open file 'avg\_fit.csv': No such file or directory  > archive=read.csv("//avg\_fit.csv",header=T);  Error in file(file, "rt") : cannot open the connection  In addition: Warning message:  In file(file, "rt") :  cannot open file '//avg\_fit.csv': No such file or directory  > archive=read.csv("..//avg\_fit.csv",header=T);  Error in file(file, "rt") : cannot open the connection  In addition: Warning message:  In file(file, "rt") :  cannot open file '..//avg\_fit.csv': No such file or directory  > archive=read.csv("C://Users//Yoan M//Documents//miproyecto//GECCO\_CEC\_smartgrid\_experiments//avg\_fit.csv",header=T);  > str(archive)  'data.frame': 20 obs. of 1 variable:  $ chaotic\_deepso.DESS.EPSO.evdeepso.Firefly.Guide.DE.UPSO.GMVNPSO.VNSDEEPSO.PSO\_GBP.CUMDANCauchy.HL\_PS\_VNSO.ABC\_DE.AJSO.CE\_CMAES.GASAPSO.HFEABC: Factor w/ 20 levels "77.04594208;186.9490898;92.18728217;68.7031629;98.33994477;129.1819686;99.67599791;35.33461284;22.98002075;80.8"| \_\_truncated\_\_,..: 20 2 16 12 8 14 11 15 7 6 ...  > archive=read.csv("C://Users//Yoan M//Documents//miproyecto//GECCO\_CEC\_smartgrid\_experiments//avg\_fit.csv",header=T);  > str(archive)  'data.frame': 20 obs. of 17 variables:  $ chaotic\_deepso: num 96.6 81.5 92.6 89 87.6 ...  $ DESS : num 183 205 194 178 201 ...  $ EPSO : num 90.3 88.9 62.9 99.5 79.8 ...  $ evdeepso : num 78.8 77.6 77.9 78.3 79 ...  $ Firefly : num 107.9 98.7 105.1 102.8 112.4 ...  $ Guide.DE : num 128 120 121 97 140 ...  $ UPSO : num 99.6 89.5 89.1 110.7 97.8 ...  $ GMVNPSO : num 32.6 35.2 35.2 35 36.2 ...  $ VNSDEEPSO : num 22.5 22.5 26.9 23 22.4 ...  $ PSO\_GBP : num 80.5 80.9 81.1 80.9 81 ...  $ CUMDANCauchy : num 59.2 51 61.5 53.6 45.9 ...  $ HL\_PS\_VNSO : num 36.2 34.7 37.4 34.4 35.2 ...  $ ABC\_DE : num 80.1 88.9 86.3 87.8 87.4 ...  $ AJSO : num 425 366 450 464 456 ...  $ CE\_CMAES : num 229 379 219 198 167 ...  $ GASAPSO : num 82.3 111.4 82.7 89.6 81.1 ...  $ HFEABC : num 212 346 145 121 176 ...  > archive=read.csv("C://Users//Yoan M//Documents//miproyecto//GECCO\_CEC\_smartgrid\_experiments//avg\_fit.csv",header=T);  > str(archive)  'data.frame': 20 obs. of 17 variables:  $ chaotic\_deepso: num 96.6 81.5 92.6 89 87.6 ...  $ DESS : num 183 205 194 178 201 ...  $ EPSO : num 90.3 88.9 62.9 99.5 79.8 ...  $ evdeepso : num 78.8 77.6 77.9 78.3 79 ...  $ Firefly : num 107.9 98.7 105.1 102.8 112.4 ...  $ Guide\_DE : num 128 120 121 97 140 ...  $ UPSO : num 99.6 89.5 89.1 110.7 97.8 ...  $ GMVNPSO : num 32.6 35.2 35.2 35 36.2 ...  $ VNSDEEPSO : num 22.5 22.5 26.9 23 22.4 ...  $ PSO\_GBP : num 80.5 80.9 81.1 80.9 81 ...  $ CUMDANCauchy : num 59.2 51 61.5 53.6 45.9 ...  $ HL\_PS\_VNSO : num 36.2 34.7 37.4 34.4 35.2 ...  $ ABC\_DE : num 80.1 88.9 86.3 87.8 87.4 ...  $ AJSO : num 425 366 450 464 456 ...  $ CE\_CMAES : num 229 379 219 198 167 ...  $ GASAPSO : num 82.3 111.4 82.7 89.6 81.1 ...  $ HFEABC : num 212 346 145 121 176 ...  > archive=read.csv("C://Users//Yoan M//Documents//miproyecto//GECCO\_CEC\_smartgrid\_experiments//avg\_fit.csv",header=T);  > str(archive)  'data.frame': 20 obs. of 17 variables:  $ chaotic\_deepso: num 96.6 81.5 92.6 89 87.6 ...  $ DESS : num 183 205 194 178 201 ...  $ EPSO : num 90.3 88.9 62.9 99.5 79.8 ...  $ evdeepso : num 78.8 77.6 77.9 78.3 79 ...  $ Firefly : num 107.9 98.7 105.1 102.8 112.4 ...  $ Guide\_DE : num 128 120 121 97 140 ...  $ UPSO : num 99.6 89.5 89.1 110.7 97.8 ...  $ GMVNPSO : num 32.6 35.2 35.2 35 36.2 ...  $ VNSDEEPSO : num 22.5 22.5 26.9 23 22.4 ...  $ PSO\_GBP : num 80.5 80.9 81.1 80.9 81 ...  $ CUMDANCauchy : num 59.2 51 61.5 53.6 45.9 ...  $ HL\_PS\_VNSO : num 36.2 34.7 37.4 34.4 35.2 ...  $ ABC\_DE : num 80.1 88.9 86.3 87.8 87.4 ...  $ AJSO : num 425 366 450 464 456 ...  $ CE\_CMAES : num 229 379 219 198 167 ...  $ GASAPSO : num 82.3 111.4 82.7 89.6 81.1 ...  $ HFEABC : num 212 346 145 121 176 ...  > #Pregunta 1.  > #sd(archivo$ICA)  > #mean(archivo$ICA)  > shapiro.test(archive$chaotic\_deepso)  Shapiro-Wilk normality test  data: archive$chaotic\_deepso  W = 0.94098, p-value = 0.2502  > archive=read.csv("C://Users//Yoan M//Documents//miproyecto//GECCO\_CEC\_smartgrid\_experiments//avg\_fit.csv",header=T);  > str(archive)  'data.frame': 20 obs. of 17 variables:  $ chaotic\_deepso: num 96.6 81.5 92.6 89 87.6 ...  $ DESS : num 183 205 194 178 201 ...  $ EPSO : num 90.3 88.9 62.9 99.5 79.8 ...  $ evdeepso : num 78.8 77.6 77.9 78.3 79 ...  $ Firefly : num 107.9 98.7 105.1 102.8 112.4 ...  $ Guide\_DE : num 128 120 121 97 140 ...  $ UPSO : num 99.6 89.5 89.1 110.7 97.8 ...  $ GMVNPSO : num 32.6 35.2 35.2 35 36.2 ...  $ VNSDEEPSO : num 22.5 22.5 26.9 23 22.4 ...  $ PSO\_GBP : num 80.5 80.9 81.1 80.9 81 ...  $ CUMDANCauchy : num 59.2 51 61.5 53.6 45.9 ...  $ HL\_PS\_VNSO : num 36.2 34.7 37.4 34.4 35.2 ...  $ ABC\_DE : num 80.1 88.9 86.3 87.8 87.4 ...  $ AJSO : num 425 366 450 464 456 ...  $ CE\_CMAES : num 229 379 219 198 167 ...  $ GASAPSO : num 82.3 111.4 82.7 89.6 81.1 ...  $ HFEABC : num 212 346 145 121 176 ...  > #normality test < 100 cases (Shapiro-Wilks Test)  > #chaotic\_deepso  > shapiro.test(archive$chaotic\_deepso)  Shapiro-Wilk normality test  data: archive$chaotic\_deepso  W = 0.94098, p-value = 0.2502  > #DESS  > shapiro.test(archive$DESS)  Shapiro-Wilk normality test  data: archive$DESS  W = 0.96335, p-value = 0.6126  > #EPSO  > shapiro.test(archive$EPSO)  Shapiro-Wilk normality test  data: archive$EPSO  W = 0.97596, p-value = 0.8721  > #evdeepso  > shapiro.test(archive$evdeepso)  Shapiro-Wilk normality test  data: archive$evdeepso  W = 0.78532, p-value = 0.0005262  > #Firefly  > shapiro.test(archive$Firefly)  Shapiro-Wilk normality test  data: archive$Firefly  W = 0.94073, p-value = 0.2475  > #Guide\_DE  > shapiro.test(archive$Guide\_DE)  Shapiro-Wilk normality test  data: archive$Guide\_DE  W = 0.92928, p-value = 0.1496  > #UPSO  > shapiro.test(archive$UPSO)  Shapiro-Wilk normality test  data: archive$UPSO  W = 0.96624, p-value = 0.6743  > #GMVNPSO  > shapiro.test(archive$GMVNPSO)  Shapiro-Wilk normality test  data: archive$GMVNPSO  W = 0.9787, p-value = 0.9163  > #VNSDEEPSO  > shapiro.test(archive$VNSDEEPSO)  Shapiro-Wilk normality test  data: archive$VNSDEEPSO  W = 0.52637, p-value = 5.556e-07  > #PSO\_GBP  > shapiro.test(archive$PSO\_GBP)  Shapiro-Wilk normality test  data: archive$PSO\_GBP  W = 0.81263, p-value = 0.001341  > #CUMDANCauchy  > shapiro.test(archive$CUMDANCauchy)  Shapiro-Wilk normality test  data: archive$CUMDANCauchy  W = 0.90067, p-value = 0.04246  > #HL\_PS\_VNSO  > shapiro.test(archive$HL\_PS\_VNSO)  Shapiro-Wilk normality test  data: archive$HL\_PS\_VNSO  W = 0.9176, p-value = 0.08909  > #ABC\_DE  > shapiro.test(archive$ABC\_DE)  Shapiro-Wilk normality test  data: archive$ABC\_DE  W = 0.86353, p-value = 0.009061  > #AJSO  > shapiro.test(archive$AJSO)  Shapiro-Wilk normality test  data: archive$AJSO  W = 0.92479, p-value = 0.1226  > #CE\_CMAES  > shapiro.test(archive$CE\_CMAES)  Shapiro-Wilk normality test  data: archive$CE\_CMAES  W = 0.70908, p-value = 5.041e-05  > #GASAPSO  > shapiro.test(archive$GASAPSO)  Shapiro-Wilk normality test  data: archive$GASAPSO  W = 0.68063, p-value = 2.285e-05  > #HFEABC  > shapiro.test(archive$HFEABC)  Shapiro-Wilk normality test  data: archive$HFEABC  W = 0.77111, p-value = 0.0003305  > FriendmanTest("C://Users//Yoan M//Documents//miproyecto//GECCO\_CEC\_smartgrid\_experiments//avg\_fit.csv")  Error in FriendmanTest("C://Users//Yoan M//Documents//miproyecto//GECCO\_CEC\_smartgrid\_experiments//avg\_fit.csv") :  could not find function "FriendmanTest"  > #############################################################  > # This code was created by: Yoan Martínez López #  > # email: yoan.martinez@reduc.edu.cu #  > # cybervalient@gmail.com #  > # 2021 #  > #############################################################  > source("tests.R")  Error in file(filename, "r", encoding = encoding) :  cannot open the connection  In addition: Warning message:  In file(filename, "r", encoding = encoding) :  cannot open file 'tests.R': No such file or directory  > source("post\_hoc.R")  Error in file(filename, "r", encoding = encoding) :  cannot open the connection  In addition: Warning message:  In file(filename, "r", encoding = encoding) :  cannot open file 'post\_hoc.R': No such file or directory  > #############################################################  > # This code was created by: Yoan Martínez López #  > # email: yoan.martinez@reduc.edu.cu #  > # cybervalient@gmail.com #  > # 2021 #  > #############################################################  > source("C://Users//Yoan M//Documents//miproyecto//GECCO\_CEC\_smartgrid\_experiments//more//tests.R")  > source("C://Users//Yoan M//Documents//miproyecto//GECCO\_CEC\_smartgrid\_experiments//more//post\_hoc.R")  > library(FSA)  Error in library(FSA) : there is no package called ‘FSA’  > FriendmanTest <-function(dataFile, sep =";"){  + x<-read.table(dataFile, header = TRUE, sep = sep)  +  + print(friedmanTest(x))  +  + print(imanDavenportTest(x))  + #calculate Mean of rank  + mean.rank<-colMeans(rankMatrix(x))  + #Sorted Vector  + pos<-order(mean.rank)[1]  +  + mean.rank = mean.rank[order(mean.rank)]  +  + FriendRank<-data.frame(Ranking=mean.rank)  +  + print(FriendRank)  +  + postHoc<-friedmanPost(x, control = NULL)  + hoc\_vector<-postHoc[pos,]  + bad<-is.na(hoc\_vector)  + hoc\_v<-hoc\_vector[!bad]  + Data <- data.frame(P\_value=hoc\_v)  +  + ### Check if data is ordered the way we intended  + headtail(Data)  +  + ### Perform p-value adjustments and add to data frame  + ##Controlling the familywise error rate: Bonferroni correction  + ####The methods Holm, Hochberg, Hommel, and Bonferroni control the family-wise error rate. These methods attempt to limit the probability of even one false discovery (a type I error, incorrectly rejecting the null hypothesis when there is no real effect), and so are all relatively strong (conservative).  + Data$Bonferroni =  + p.adjust(Data$P\_value,  + method = "bonferroni")  +  + Data$BH =  + p.adjust(Data$P\_value,  + method = "BH")  +  + Data$Holm =  + p.adjust(Data$P\_value,  + method = "holm")  +  + Data$Hochberg =  + p.adjust(Data$P\_value,  + method = "hochberg")  +  + Data$Hommel =  + p.adjust(Data$P\_value,  + method = "hommel")  +  + Data$BY =  + p.adjust(Data$P\_value,  + method = "BY")  +  + print(Data)  + X = Data$P\_value  + Y = cbind(Data$Bonferroni,  + Data$BH,  + Data$Holm,  + Data$Hochberg,  + Data$Hommel,  + Data$BY)  +  + matplot(X, Y,  + xlab="p-value",  + ylab="Adjusted p-value",  + type="l",  + asp=1,  + col=1:6,  + lty=1,  + lwd=2)  +  + legend('bottomright',  + legend = c("Bonferroni", "BH", "Holm", "Hochberg", "Hommel", "BY"),  + col = 1:6,  + cex = 1,  + pch = 16)  +  + abline(0, 1,  + col=1,  + lty=2,  + lwd=1)  + }  > FriendmanTest("C://Users//Yoan M//Documents//miproyecto//GECCO\_CEC\_smartgrid\_experiments//avg\_fit.csv")  C:\Users\Yoan M\AppData\Local\Microsoft\Windows\INetCache\Content.MSO\49F4CD7F.tmp Hide Traceback    C:\Users\Yoan M\AppData\Local\Microsoft\Windows\INetCache\Content.MSO\2956B2E5.tmp Rerun with Debug    Error in -x : invalid argument to unary operator     |  |  | | --- | --- | | 10. | rank(-x, ties.method = "average") at  tests.R#123 |  |  |  | | --- | --- | | 9. | FUN(newX[, i], ...) |  |  |  | | --- | --- | | 8. | apply(data, MARGIN = 1, FUN = f) |  |  |  | | --- | --- | | 7. | t(apply(data, MARGIN = 1, FUN = f)) at  tests.R#131 |  |  |  | | --- | --- | | 6. | rankMatrix(data) at  tests.R#154 |  |  |  | | --- | --- | | 5. | is.data.frame(x) |  |  |  | | --- | --- | | 4. | colMeans(rankMatrix(data)) at  tests.R#154 |  |  |  | | --- | --- | | 3. | friedmanTest(x) |  |  |  | | --- | --- | | 2. | print(friedmanTest(x)) |  |  |  | | --- | --- | | 1. | FriendmanTest("C://Users//Yoan M//Documents//miproyecto//GECCO\_CEC\_smartgrid\_experiments//avg\_fit.csv") |   > #############################################################  > # This code was created by: Yoan Martínez López #  > # email: yoan.martinez@reduc.edu.cu #  > # cybervalient@gmail.com #  > # 2021 #  > #############################################################  > source("C://Users//Yoan M//Documents//miproyecto//GECCO\_CEC\_smartgrid\_experiments//more//tests.R")  > source("C://Users//Yoan M//Documents//miproyecto//GECCO\_CEC\_smartgrid\_experiments//more//post\_hoc.R")  > library(FSA)  Error in library(FSA) : there is no package called ‘FSA’  > FriendmanTest <-function(dataFile, sep =","){  + x<-read.table(dataFile, header = TRUE, sep = sep)  +  + print(friedmanTest(x))  +  + print(imanDavenportTest(x))  + #calculate Mean of rank  + mean.rank<-colMeans(rankMatrix(x))  + #Sorted Vector  + pos<-order(mean.rank)[1]  +  + mean.rank = mean.rank[order(mean.rank)]  +  + FriendRank<-data.frame(Ranking=mean.rank)  +  + print(FriendRank)  +  + postHoc<-friedmanPost(x, control = NULL)  + hoc\_vector<-postHoc[pos,]  + bad<-is.na(hoc\_vector)  + hoc\_v<-hoc\_vector[!bad]  + Data <- data.frame(P\_value=hoc\_v)  +  + ### Check if data is ordered the way we intended  + headtail(Data)  +  + ### Perform p-value adjustments and add to data frame  + ##Controlling the familywise error rate: Bonferroni correction  + ####The methods Holm, Hochberg, Hommel, and Bonferroni control the family-wise error rate. These methods attempt to limit the probability of even one false discovery (a type I error, incorrectly rejecting the null hypothesis when there is no real effect), and so are all relatively strong (conservative).  + Data$Bonferroni =  + p.adjust(Data$P\_value,  + method = "bonferroni")  +  + Data$BH =  + p.adjust(Data$P\_value,  + method = "BH")  +  + Data$Holm =  + p.adjust(Data$P\_value,  + method = "holm")  +  + Data$Hochberg =  + p.adjust(Data$P\_value,  + method = "hochberg")  +  + Data$Hommel =  + p.adjust(Data$P\_value,  + method = "hommel")  +  + Data$BY =  + p.adjust(Data$P\_value,  + method = "BY")  +  + print(Data)  + X = Data$P\_value  + Y = cbind(Data$Bonferroni,  + Data$BH,  + Data$Holm,  + Data$Hochberg,  + Data$Hommel,  + Data$BY)  +  + matplot(X, Y,  + xlab="p-value",  + ylab="Adjusted p-value",  + type="l",  + asp=1,  + col=1:6,  + lty=1,  + lwd=2)  +  + legend('bottomright',  + legend = c("Bonferroni", "BH", "Holm", "Hochberg", "Hommel", "BY"),  + col = 1:6,  + cex = 1,  + pch = 16)  +  + abline(0, 1,  + col=1,  + lty=2,  + lwd=1)  + }  > FriendmanTest("C://Users//Yoan M//Documents//miproyecto//GECCO\_CEC\_smartgrid\_experiments//avg\_fit.csv")  Friedman's rank sum test  data: x  Friedman's chi-squared = 300.5, df = 16, p-value < 2.2e-16  Iman Davenport's correction of Friedman's rank sum test  data: x  Corrected Friedman's chi-squared = 292.83, df1 = 16, df2 = 304, p-value <  2.2e-16  Ranking  AJSO 1.10  CE\_CMAES 2.70  DESS 2.75  HFEABC 4.10  Guide\_DE 5.55  UPSO 6.35  Firefly 6.55  chaotic\_deepso 8.75  GASAPSO 9.35  ABC\_DE 9.85  EPSO 10.00  PSO\_GBP 11.45  evdeepso 12.75  CUMDANCauchy 13.75  HL\_PS\_VNSO 15.45  GMVNPSO 15.55  VNSDEEPSO 17.00  Error in headtail(Data) : could not find function "headtail"  Warning: unable to access index for repository https://cran.rstudio.com/src/contrib:  cannot open URL 'https://cran.rstudio.com/src/contrib/PACKAGES'  > install.packages("~/miproyecto/GECCO\_CEC\_smartgrid\_experiments/more/FSA\_0.8.1.tar.gz", repos = NULL, type = "source")  Installing package into ‘C:/Users/Yoan M/Documents/R/win-library/3.6’  (as ‘lib’ is unspecified)  \* installing \*source\* package 'FSA' ...  \*\* package 'FSA' successfully unpacked and MD5 sums checked  \*\* using staged installation  \*\* R  \*\* data  \*\*\* moving datasets to lazyload DB  \*\* inst  \*\* byte-compile and prepare package for lazy loading  \*\* help  \*\*\* installing help indices  converting help for package 'FSA'  finding HTML links ... done  BluegillJL html  BrookTroutTH html  ChinookArg html  CodNorwegian html  CutthroatAL html  Ecoli html  FSA-internals html  FSA html  FSAUtils html  Mirex html  PSDlit html  PikeNY html  PikeNYPartial1 html  SMBassLS html  SMBassWB html  Schnute html  SpotVA1 html  Subset html  Summarize html  WR79 html  WSlit html  WhitefishLC html  addRadCap html  addZeroCatch html  ageBias html  agePrecision html  alkAgeDist html  alkIndivAge html  alkMeanVar html  alkPlot html  bcFuns html  binCI html  bootCase html  capHistConvert html  capHistSum html  catchCurve html  chapmanRobson html  chooseColors html  col2rgbt html  compIntercepts html  compSlopes html  Rd warning: C:/Users/Yoan M/AppData/Local/Temp/Rtmp8mviwH/R.INSTALL838169b6319/FSA/man/compSlopes.Rd:16: file link 'p.adjust.methods' in package 'stats' does not exist and so has been treated as a topic  Rd warning: C:/Users/Yoan M/AppData/Local/Temp/Rtmp8mviwH/R.INSTALL838169b6319/FSA/man/compSlopes.Rd:55: file link 'p.adjust.methods' in package 'stats' does not exist and so has been treated as a topic  depletion html  dunnTest html  expandCounts html  expandLenFreq html  extraTests html  fact2num html  fishR html  fitPlot html  fsaNews html  gConvert html  growthModels html  headtail html  hist.formula html  hoCoef html  hyperCI html  knitUtil html  Rd warning: C:/Users/Yoan M/AppData/Local/Temp/Rtmp8mviwH/R.INSTALL838169b6319/FSA/man/knitUtil.Rd:69: file link 'purl' in package 'knitr' does not exist and so has been treated as a topic  Rd warning: C:/Users/Yoan M/AppData/Local/Temp/Rtmp8mviwH/R.INSTALL838169b6319/FSA/man/knitUtil.Rd:104: file link 'purl' in package 'knitr' does not exist and so has been treated as a topic  ksTest html  lagratio html  lencat html  logbtcf html  lwCompPreds html  mapvalues html  metaM html  mrClosed html  mrOpen html  nlsBoot html  oddeven html  perc html  plotBinResp html  poiCI html  psdAdd html  psdCI html  psdCalc html  psdPlot html  psdVal html  rcumsum html  removal html  residPlot html  se html  srStarts html  stockRecruitment html  sumTable html  tictactoe html  validn html  vbStarts html  wrAdd html  wsVal html  \*\* building package indices  \*\* testing if installed package can be loaded from temporary location  \*\*\* arch - i386  \*\*\* arch - x64  \*\* testing if installed package can be loaded from final location  \*\*\* arch - i386  \*\*\* arch - x64  \*\* testing if installed package keeps a record of temporary installation path  \* DONE (FSA)  > library(FSA)  ############################################  ## FSA package, version 0.8.1 ##  ## Derek H. Ogle, Northland College ##  ## ##  ## Run ?FSA for documentation. ##  ## Run citation('FSA') for citation ... ##  ## please cite if used in publication. ##  ## ##  ## See derekogle.com/fishR/ for more ##  ## thorough analytical vignettes. ##  ############################################  > #############################################################  > # This code was created by: Yoan Martínez López #  > # email: yoan.martinez@reduc.edu.cu #  > # cybervalient@gmail.com #  > # 2021 #  > #############################################################  > source("C://Users//Yoan M//Documents//miproyecto//GECCO\_CEC\_smartgrid\_experiments//more//tests.R")  > source("C://Users//Yoan M//Documents//miproyecto//GECCO\_CEC\_smartgrid\_experiments//more//post\_hoc.R")  > library(FSA)  > FriendmanTest <-function(dataFile, sep =","){  + x<-read.table(dataFile, header = TRUE, sep = sep)  +  + print(friedmanTest(x))  +  + print(imanDavenportTest(x))  + #calculate Mean of rank  + mean.rank<-colMeans(rankMatrix(x))  + #Sorted Vector  + pos<-order(mean.rank)[1]  +  + mean.rank = mean.rank[order(mean.rank)]  +  + FriendRank<-data.frame(Ranking=mean.rank)  +  + print(FriendRank)  +  + postHoc<-friedmanPost(x, control = NULL)  + hoc\_vector<-postHoc[pos,]  + bad<-is.na(hoc\_vector)  + hoc\_v<-hoc\_vector[!bad]  + Data <- data.frame(P\_value=hoc\_v)  +  + ### Check if data is ordered the way we intended  + headtail(Data)  +  + ### Perform p-value adjustments and add to data frame  + ##Controlling the familywise error rate: Bonferroni correction  + ####The methods Holm, Hochberg, Hommel, and Bonferroni control the family-wise error rate. These methods attempt to limit the probability of even one false discovery (a type I error, incorrectly rejecting the null hypothesis when there is no real effect), and so are all relatively strong (conservative).  + Data$Bonferroni =  + p.adjust(Data$P\_value,  + method = "bonferroni")  +  + Data$BH =  + p.adjust(Data$P\_value,  + method = "BH")  +  + Data$Holm =  + p.adjust(Data$P\_value,  + method = "holm")  +  + Data$Hochberg =  + p.adjust(Data$P\_value,  + method = "hochberg")  +  + Data$Hommel =  + p.adjust(Data$P\_value,  + method = "hommel")  +  + Data$BY =  + p.adjust(Data$P\_value,  + method = "BY")  +  + print(Data)  + X = Data$P\_value  + Y = cbind(Data$Bonferroni,  + Data$BH,  + Data$Holm,  + Data$Hochberg,  + Data$Hommel,  + Data$BY)  +  + matplot(X, Y,  + xlab="p-value",  + ylab="Adjusted p-value",  + type="l",  + asp=1,  + col=1:6,  + lty=1,  + lwd=2)  +  + legend('bottomright',  + legend = c("Bonferroni", "BH", "Holm", "Hochberg", "Hommel", "BY"),  + col = 1:6,  + cex = 1,  + pch = 16)  +  + abline(0, 1,  + col=1,  + lty=2,  + lwd=1)  + }  > FriendmanTest("C://Users//Yoan M//Documents//miproyecto//GECCO\_CEC\_smartgrid\_experiments//avg\_fit.csv")  Friedman's rank sum test  data: x  Friedman's chi-squared = 300.5, df = 16, p-value < 2.2e-16  Iman Davenport's correction of Friedman's rank sum test  data: x  Corrected Friedman's chi-squared = 292.83, df1 = 16, df2 = 304, p-value <  2.2e-16  Ranking  AJSO 1.10  CE\_CMAES 2.70  DESS 2.75  HFEABC 4.10  Guide\_DE 5.55  UPSO 6.35  Firefly 6.55  chaotic\_deepso 8.75  GASAPSO 9.35  ABC\_DE 9.85  EPSO 10.00  PSO\_GBP 11.45  evdeepso 12.75  CUMDANCauchy 13.75  HL\_PS\_VNSO 15.45  GMVNPSO 15.55  VNSDEEPSO 17.00  P\_value Bonferroni BH Holm Hochberg  chaotic\_deepso 1.662702e-06 2.660323e-05 2.660323e-06 1.163891e-05 1.163891e-05  DESS 3.014775e-01 1.000000e+00 3.163635e-01 6.029550e-01 3.163635e-01  EPSO 2.498205e-08 3.997129e-07 5.710184e-08 2.498205e-07 2.498205e-07  evdeepso 2.975398e-13 4.760636e-12 9.521273e-13 3.570477e-12 3.570477e-12  Firefly 6.427024e-04 1.028324e-02 9.348399e-04 3.856215e-03 3.856215e-03  Guide\_DE 5.324806e-03 8.519690e-02 6.553608e-03 2.129922e-02 2.129922e-02  UPSO 1.010175e-03 1.616280e-02 1.346900e-03 5.050874e-03 5.050874e-03  GMVNPSO 0.000000e+00 0.000000e+00 0.000000e+00 0.000000e+00 0.000000e+00  VNSDEEPSO 0.000000e+00 0.000000e+00 0.000000e+00 0.000000e+00 0.000000e+00  PSO\_GBP 9.086243e-11 1.453799e-09 2.422998e-10 9.994867e-10 9.994867e-10  CUMDANCauchy 2.442491e-15 3.907985e-14 9.769963e-15 3.175238e-14 3.175238e-14  HL\_PS\_VNSO 0.000000e+00 0.000000e+00 0.000000e+00 0.000000e+00 0.000000e+00  ABC\_DE 4.266197e-08 6.825916e-07 8.532395e-08 3.839578e-07 3.839578e-07  CE\_CMAES 3.163635e-01 1.000000e+00 3.163635e-01 6.029550e-01 3.163635e-01  GASAPSO 2.387091e-07 3.819345e-06 4.243717e-07 1.909673e-06 1.909673e-06  HFEABC 6.028917e-02 9.646268e-01 6.890191e-02 1.808675e-01 1.808675e-01  Hommel BY  chaotic\_deepso 1.163891e-05 8.993832e-06  DESS 3.163635e-01 1.000000e+00  EPSO 2.248385e-07 1.930458e-07  evdeepso 3.570477e-12 3.218884e-12  Firefly 3.213512e-03 3.160440e-03  Guide\_DE 2.129922e-02 2.215597e-02  UPSO 5.050874e-03 4.553503e-03  GMVNPSO 0.000000e+00 0.000000e+00  VNSDEEPSO 0.000000e+00 0.000000e+00  PSO\_GBP 9.994867e-10 8.191500e-10  CUMDANCauchy 3.175238e-14 3.302960e-14  HL\_PS\_VNSO 0.000000e+00 0.000000e+00  ABC\_DE 3.839578e-07 2.884571e-07  CE\_CMAES 3.163635e-01 1.000000e+00  GASAPSO 1.909673e-06 1.434686e-06  HFEABC 1.808675e-01 2.329387e-01 |
| Friedman's rank sum test  data: x  Friedman's chi-squared = 300.5, df = 16, p-value < 2.2e-16  Iman Davenport's correction of Friedman's rank sum test  data: x  Corrected Friedman's chi-squared = 292.83, df1 = 16, df2 = 304, p-value <  2.2e-16  Ranking  VNSDEEPSO 1.00  GMVNPSO 2.45  HL\_PS\_VNSO 2.55  CUMDANCauchy 4.25  evdeepso 5.25  PSO\_GBP 6.55  EPSO 8.00  ABC\_DE 8.15  GASAPSO 8.65  chaotic\_deepso 9.25  Firefly 11.45  UPSO 11.65  Guide\_DE 12.45  HFEABC 13.90  DESS 15.25  CE\_CMAES 15.30  AJSO 16.90  P\_value Bonferroni BH Holm Hochberg  chaotic\_deepso 2.387091e-07 3.819345e-06 4.774182e-07 2.148382e-06 2.148382e-06  DESS 0.000000e+00 0.000000e+00 0.000000e+00 0.000000e+00 0.000000e+00  EPSO 1.167501e-05 1.868001e-04 1.698183e-05 7.005005e-05 7.005005e-05  evdeepso 7.780415e-03 1.244866e-01 9.575895e-03 3.112166e-02 3.112166e-02  Firefly 5.987721e-11 9.580354e-10 1.368622e-10 5.987721e-10 5.987721e-10  Guide\_DE 7.485124e-13 1.197620e-11 2.395240e-12 8.982148e-12 8.982148e-12  UPSO 2.570455e-11 4.112728e-10 6.854547e-11 2.827500e-10 2.827500e-10  GMVNPSO 3.638649e-01 1.000000e+00 3.638649e-01 6.634475e-01 3.638649e-01  PSO\_GBP 5.098168e-04 8.157069e-03 6.797557e-04 2.549084e-03 2.549084e-03  CUMDANCauchy 4.182784e-02 6.692455e-01 4.780325e-02 1.254835e-01 1.254835e-01  HL\_PS\_VNSO 3.317238e-01 1.000000e+00 3.538387e-01 6.634475e-01 3.638649e-01  ABC\_DE 7.552093e-06 1.208335e-04 1.208335e-05 5.286465e-05 5.286465e-05  AJSO 0.000000e+00 0.000000e+00 0.000000e+00 0.000000e+00 0.000000e+00  CE\_CMAES 0.000000e+00 0.000000e+00 0.000000e+00 0.000000e+00 0.000000e+00  GASAPSO 1.662702e-06 2.660323e-05 2.955915e-06 1.330162e-05 1.330162e-05  HFEABC 6.661338e-16 1.065814e-14 2.664535e-15 8.659740e-15 8.659740e-15  Hommel BY  chaotic\_deepso 2.148382e-06 1.614022e-06  DESS 0.000000e+00 0.000000e+00  EPSO 7.005005e-05 5.741097e-05  evdeepso 3.112166e-02 3.237351e-02  Firefly 5.987721e-10 4.626940e-10  Guide\_DE 8.982148e-12 8.097656e-12  UPSO 2.827500e-10 2.317336e-10  GMVNPSO 3.638649e-01 1.000000e+00  PSO\_GBP 2.549084e-03 2.298070e-03  CUMDANCauchy 1.254835e-01 1.616098e-01  HL\_PS\_VNSO 3.638649e-01 1.000000e+00  ABC\_DE 4.531256e-05 4.085053e-05  AJSO 0.000000e+00 0.000000e+00  CE\_CMAES 0.000000e+00 0.000000e+00  GASAPSO 1.330162e-05 9.993147e-06  HFEABC 8.659740e-15 9.008072e-15 |
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> #############################################################

> # This code was created by: Yoan Martínez López #

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> # 2021 #

> #############################################################

> source("C://Users//Yoan M//Documents//miproyecto//GECCO\_CEC\_smartgrid\_experiments//more//tests.R")

> source("C://Users//Yoan M//Documents//miproyecto//GECCO\_CEC\_smartgrid\_experiments//more//post\_hoc.R")

> library(FSA)

> Wilcoxontest <-function(x,y){

+ wilcoxonSignedTest(x,y)

+ }

> archive<-read.table("C://Users//Yoan M//Documents//miproyecto//GECCO\_CEC\_smartgrid\_experiments//avg\_fit.csv", header = TRUE, sep =",")

> #CUMDANCauchy vs chaotic\_deepso

> Wilcoxontest(archive$CUMDANCauchy,archive$chaotic\_deepso)

Wilcoxon Signed-Rank test

data: data

T = 0, p-value = 4.429e-05

> #CUMDANCauchy vs DESS

> Wilcoxontest(archive$CUMDANCauchy, archive$DESS)

Wilcoxon Signed-Rank test

data: data

T = 0, p-value = 4.429e-05

> #CUMDANCauchy vs EPSO

> Wilcoxontest( archive$CUMDANCauchy, archive$EPSO)

Wilcoxon Signed-Rank test

data: data

T = 37, p-value = 0.005565

> #CUMDANCauchy vs evdeepso

> Wilcoxontest( archive$CUMDANCauchy, archive$evdeepso)

Wilcoxon Signed-Rank test

data: data

T = 39, p-value = 0.006871

> #CUMDANCauchy vs Firefly

> Wilcoxontest( archive$CUMDANCauchy, archive$Firefly)

Wilcoxon Signed-Rank test

data: data

T = 0, p-value = 4.429e-05

> #CUMDANCauchy vs Guide\_DE

> Wilcoxontest( archive$CUMDANCauchy, archive$Guide\_DE)

Wilcoxon Signed-Rank test

data: data

T = 0, p-value = 4.429e-05

> #CUMDANCauchy vs UPSO

> Wilcoxontest( archive$CUMDANCauchy, archive$UPSO)

Wilcoxon Signed-Rank test

data: data

T = 0, p-value = 4.429e-05

> #CUMDANCauchy vs GMVNPSO

> Wilcoxontest( archive$CUMDANCauchy, archive$GMVNPSO)

Wilcoxon Signed-Rank test

data: data

T = 0, p-value = 4.429e-05

> #CUMDANCauchy vs VNSDEEPSO

> Wilcoxontest( archive$CUMDANCauchy, archive$VNSDEEPSO)

Wilcoxon Signed-Rank test

data: data

T = 0, p-value = 4.429e-05

> #CUMDANCauchy vs PSO\_GBP

> Wilcoxontest( archive$CUMDANCauchy, archive$PSO\_GBP)

Wilcoxon Signed-Rank test

data: data

T = 20, p-value = 0.0007536

> #CUMDANCauchy vs HL\_PS\_VNSO

> Wilcoxontest( archive$CUMDANCauchy, archive$HL\_PS\_VNSO)

Wilcoxon Signed-Rank test

data: data

T = 0, p-value = 4.429e-05

> #CUMDANCauchy vs ABC\_DE

> Wilcoxontest( archive$CUMDANCauchy, archive$ABC\_DE)

Wilcoxon Signed-Rank test

data: data

T = 0, p-value = 4.429e-05

> #CUMDANCauchy vs AJSO

> Wilcoxontest( archive$CUMDANCauchy, archive$AJSO)

Wilcoxon Signed-Rank test

data: data

T = 0, p-value = 4.429e-05

> #CUMDANCauchy vs CE\_CMAES

> Wilcoxontest( archive$CUMDANCauchy, archive$CE\_CMAES)

Wilcoxon Signed-Rank test

data: data

T = 0, p-value = 4.429e-05

> #CUMDANCauchy vs GASAPSO

> Wilcoxontest( archive$CUMDANCauchy, archive$GASAPSO)

Wilcoxon Signed-Rank test

data: data

T = 0, p-value = 4.429e-05

> #CUMDANCauchy vs HFEABC

> Wilcoxontest( archive$CUMDANCauchy, archive$HFEABC)

Wilcoxon Signed-Rank test

data: data

T = 0, p-valu