Tests

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Loading packages and functions

```
#Packages
packages <- c("rmarkdown", "sqldf", "knitr", "ENMeval", "yaml")
toInstall <- packages[!packages %in% installed.packages()]
if(length(toInstall)>0L) install.packages(toInstall)
lapply(packages, require, character.only = TRUE)
```

```
## Loading required package: rmarkdown

## Loading required package: sqldf

## Loading required package: gsubfn

## Loading required package: proto

## Loading required package: RSQLite

## Loading required package: knitr

## Loading required package: ENMeval

## Loading required package: dismo

## Loading required package: raster

## Loading required package: sp

## Loading required package: rJava

## Loading required package: parallel

## Loading required package: yaml
```

```
## [[1]]
## [1] TRUE
##
## [[2]]
## [1] TRUE
##
## [[3]]
## [1] TRUE
##
## [[4]]
## [1] TRUE
##
## [[5]]
## [1] TRUE
```

```
#Functions
source("https://raw.githubusercontent.com/manubio13/ME_Cobos_FProject/master/cal_function.R")
source("https://raw.githubusercontent.com/manubio13/ME_Cobos_FProject/master/eval_function.R")
source("https://raw.githubusercontent.com/manubio13/ME_Cobos_FProject/master/mod_function.R")
```

Tests for cal_function

Test if it can create a batch file for running maxent models

```r
#Variables with information to be used as arguments
occ_all <- "pemp_all.csv"
occ_tra <- "pemp_tra.csv"
M_var_dir <- "M"
batch_cal <- "emp_enm_calibration_models1"
cal_dir <- "Calibration_Models1"
reg_mul <- c(seq(0.5,1,0.1),seq(2,5,1))
fea_cs <- "basic"
running <- TRUE

#Executing the function
ku.enm.cal(occ.all = occ_all, occ.tra = occ_tra, M.var.dir = M_var_dir, batch = batch_cal,
           out.dir = cal_dir, reg.mult = reg_mul, f.clas = fea_cs, run = running)
```

```
##
## If asked and run = TRUE, allow runing as administrator.
## Process finished
## A maxent batch file for creating 150 calibration models has been written
## Check your working directory!!!    C:/Users/Marlon/Documents/R/Data_carpentry/ME_Cobos_FProject
```

```r
if (file.exists(paste(batch_cal, "bat", sep = "."))) {
  cat("\npassed")
} else {
  cat("\nfailed")
}
```

```
##
## passed
```

Test if batch length is appropriate acording to feature classes selection

```r
#Number of models expected to result with the defined varaibles
if(fea_cs == "all" | fea_cs == "basic" | fea_cs == "no.t.h" |
   fea_cs == "no.t.h" | fea_cs == "no.t.h"){
  if(fea_cs == "all"){
    n <- prod(length(reg_mul), length(dir("M")), 29, 2) #number of potential
    #combinations times two (two models for each combination are being created)
  }
  if(fea_cs == "basic"){
    n <- prod(length(reg_mul), length(dir("M")), 5, 2)
  }
  if(fea_cs == "no.t.h"){
    n <- prod(length(reg_mul), length(dir("M")), 7, 2)
  }
  if(fea_cs == "no.t"){
    n <- prod(length(reg_mul), length(dir("M")), 15, 2)
  }
  if(fea_cs == "no.h"){
    n <- prod(length(reg_mul), length(dir("M")), 15, 2)
  }
}else{
  n <- length(fea_cs)
```

```
}

bf <- readLines(paste(batch_cal, "bat", sep = "."))
nr <- length(bf)

if (nr == n) {
  cat("\npassed")
} else {
  cat("\nfailed")
}
```

```
##
## passed
```

Tests for eval_function

Test if it creates the folder for the evaluation results

```
#Variables with information to be used as arguments
occ_test <- "pemp_test.csv"
out_eval <- "emp_enm_evaluation_results1"
ov <- 5
rp <- 50
ni <- 100
kt <- TRUE
selc <- "OR_AICc"
##Most of the variables used here as arguments were already created
```

```
#Executing the function
ku.enm.eval(path = cal_dir, occ.all = occ_all, occ.tra = occ_tra, occ.test = occ_test,
            batch = batch_cal, out.eval = out_eval, omi.val = ov, rand.perc = rp,
            no.inter = ni, kept = kt, selection = selc)
```

```
dr <- dir()

if (out_eval %in% dr){
  cat("\npassed")
} else{
  cat("\nfailed")
}
```

```
##
## passed
```

Test if all evaluation files were created

```
#Files that should exist
files <- c ("best_models_OR_AICc.csv", "evaluation_figure.png", "evaluation_results.csv",
            "evaluation_results.html", "evaluation_stats.csv")

ev_files <- list.files(path = out_eval)

if (sum(files == ev_files) == 5){
  cat("\npassed")
} else{
```

```
    cat("\nfailed")
}
```

```
##
## passed
```

Tests for mod_function

Test if folder for final models was created

```
#Variables with information to be used as arguments
mod_dir <- "Final_Models1"
G_var_dir <- "G"
rep <- 5
rtyp <- "Bootstrap"
ofor <- "logistic"
pr <- TRUE
extyp <- "all"
##Most of the variables used here as arguments were already created

#Executing the function
ku.enm.mod(occ.all = occ_all, M.var.dir = M_var_dir, out.eval = out_eval,
           rep.n = rep, rep.type = rtyp, out.dir = mod_dir, out.format = ofor,
           project = pr, G.var.dir = G_var_dir, ext.type = extyp)
```

```
##
## If asked, allow runing as administrator.
## Process finished
## A maxent batch file for creating 6 final models and their projections has been written
## Check your working directory!!!    C:/Users/Marlon/Documents/R/Data_carpentry/ME_Cobos_FProject
```

```
dr1 <- dir()

if (G_var_dir %in% dr1) {
  cat("\npassed")
} else{
  cat("\nfailed")
}
```

```
##
## passed
```

Test if all subdirectories were created for final models in the Final models folder

```
#Subdirectories that should exist
dirn <- read.csv(paste(out_eval, "best_models_OR_AICc.csv", sep = "/"))[,1]
ext_op <- c("E", "EC", "NE")
sdirs <- paste(rep(dirn, 3), ext_op, sep = "_")

fm_dir <- list.files(path = mod_dir)

if (sum(sdirs %in% fm_dir) == length(sdirs)){
  cat("\npassed")
} else{
```

```
  cat("\nfailed")
}
```

```
## 
## passed
```