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##############################################################################################
####### Accuracy assessment of land cover 2015 at different class hierarchy    #####
#######       Contributor: Rashed Jalal                                  ####################
#######  contact: rashed.jalal@fao.org                                   ####################
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rm(list = ls())

library(xlsx)

options(stringsAsFactors = FALSE)
rootdir <- "C:/Users/Rashed/Desktop/Atlas/"

setwd(rootdir)

df_acc <- read.csv("Accuracy/Accuracy_assessment_LC_BD_2015_aggre.csv")
head(df_acc)
df_class <- read.csv("Accuracy/NLCL.csv")
head(df_class)

length(unique(df_acc$map_code))
length(unique(df_acc$GE_Class_V2))

length(unique(df_class$Agg_Code))
sum(unique(df_class$Agg_Code) %in% unique(df_acc$GE_Class_V2)) == length(unique(df_acc$GE_Class_V2))
sum(unique(df_class$Agg_Code) %in% unique(df_acc$map_code)) == length(unique(df_acc$map_code))

dbf <- merge(x = df_acc,y = df_class[,c("Level1","Level2", "Level3","Level4","Level5","Level6","Agg_
             by.x = "map_code", by.y = "Agg_Code", all.x = T)

dbf <- merge(x = dbf,y = df_class[,c("Level1","Level2", "Level3","Level4","Level5","Level6","Agg_Co
             by.x = "GE_Class_V2", by.y = "Agg_Code", all.x = T)

nrow(dbf)

head(dbf)

for (i in 1:5){
  dbf[,paste0("L",i,"_Acc")] <- ifelse(dbf[,paste0("Level",i,".x")]==dbf[,paste0("Level",i,".y")],1,
}

# dbf$L1_Acc <- ifelse(dbf$Level1.x==dbf$Level1.y,1,0)
# dbf$L2_Acc <- ifelse(dbf$Level2.x==dbf$Level2.y,1,0)
# dbf$L3_Acc <- ifelse(dbf$Level3.x==dbf$Level3.y,1,0)
# dbf$L4_Acc <- ifelse(dbf$Level4.x==dbf$Level4.y,1,0)
# dbf$L5_Acc <- ifelse(dbf$Level5.x==dbf$Level5.y,1,0)

Class_n <- list()
Acc <- list()

for (i in 1:5){
  Class_n[i] <- length(unique(dbf[,paste0("Level",i,".x")]))
  Acc[i] <- 100*sum(dbf[,paste0("L",i,"_Acc")])/nrow(dbf)
}
```

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Acc_level <- cbind(Class_n,Acc)

plot(Acc_level)

write.csv(dbf,"Accuracy/Hierachy_accuracy.csv")
```