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# == NESM_Load_Shape_Analysis(PJM+ECAR)-step1.scc ==#
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#== Read Data ==#
options(object.size= 5000000000)
name.load <- paste("c:/my stuffs/my
  research/epa/capacityexpansion/data/load_temp_analysis/PJM_ECAR_load_90_55_warmup.txt",
  sep="")
data.load <- read.table(name.load, sep="\t", header=T)
name.factor <- paste("c:/My Stuffs/My Research/epa/capacityexpansion/data/Load-Scale-Factor.txt")
factor <- read.table(name.factor, sep="\t", header=T)

data.load$TotLoad <- apply(data.load[, 2:14], 1, sum) # total load of PJM and ECAR

year <- c(1991:1998, 2050:2055)

month <- c(5:9)
day.end <- c(31, 30, 31, 31, 28)
day.start <- c(2, 1, 1, 1, 1) # from 5/2 to 9/28

data.load.new <- NULL

date <- NULL
block.Height <- NULL
for ( m in 5:9)
{
  for (d in day.start[m-4]:day.end[m-4])
  {
    for ( h in 1:24)
    {
      date.temp <- c(m, d, h)
      date <- rbind(date, t(date.temp))
    }
  }
}

date <- as.data.frame(date)
names(date) <- c("Month", "Day", "Hour")

for ( y in 1:length(year))
{
  print(year[y])
  factor.yr <- factor[, c(1:3, y+3)]
  names(factor.yr) <- c("slice", "group", "segment", "ratio")
  data.load.yr <- NULL
  start <- (y-1)*3600+1
  end <- start+3599
  #print(start)
  #print(end)
}

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data.load.yr <- data.load[start:end,]
data.load.yr <- cbind(date, data.load.yr)
data.load.yr$group <- rep(0, dim(data.load.yr)[1])
data.load.yr$segment <- rep(2, dim(data.load.yr)[1])

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# == Three Gourp ==#

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data.load.yr.MD <- data.load.yr[(data.load.yr$Hour>=8 & data.load.yr$Hour<=18), ] #midday
data.load.yr.MD$group <- rep(7, dim(data.load.yr.MD)[1])
data.load.yr.ME <- data.load.yr[(data.load.yr$Hour==6|data.load.yr$Hour==7) (data.load.yr$Hour>=19 &
  data.load.yr$Hour<=24), ] #morning and evening
data.load.yr.ME$group <- rep(8, dim(data.load.yr.ME)[1])
data.load.yr.NI <- data.load.yr[(data.load.yr$Hour>=1 & data.load.yr$Hour<=5), ] #Night
data.load.yr.NI$group <- rep(9, dim(data.load.yr.NI)[1])

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#== segments ==#

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cutoff.MD <- quantile(data.load.yr.MD$TotLoad, c(0.99, 0.66))
data.load.yr.MD$segment[data.load.yr.MD$TotLoad > cutoff.MD[1]] <-1 #peak/reference blok: group=7
  and segment=1
data.load.yr.MD$segment[data.load.yr.MD$TotLoad < cutoff.MD[2]] <- 3
cutoff.ME <- quantile(data.load.yr.ME$TotLoad, c(0.99, 0.66))
data.load.yr.ME$segment[data.load.yr.ME$TotLoad > cutoff.ME[1]] <-1
data.load.yr.ME$segment[data.load.yr.ME$TotLoad < cutoff.ME[2]] <- 3
cutoff.NI <- quantile(data.load.yr.NI$TotLoad, c(0.99, 0.66))
data.load.yr.NI$segment[data.load.yr.NI$TotLoad > cutoff.NI[1]] <-1
data.load.yr.NI$segment[data.load.yr.NI$TotLoad < cutoff.NI[2]] <- 3

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# == Combine with Ratio ==#

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data.load.yr.MD <- merge(data.load.yr.MD, factor.yr, by.x=c("group", "segment"), by.y=c(
  "group", "segment"))
data.load.yr.ME <- merge(data.load.yr.ME, factor.yr, by.x=c("group", "segment"), by.y=c(
  "group", "segment"))
data.load.yr.NI <- merge(data.load.yr.NI, factor.yr, by.x=c("group", "segment"), by.y=c(
  "group", "segment"))

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#== Put Segement together ==#

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data.load.yr.new.temp <- rbind(data.load.yr.MD, data.load.yr.ME)
data.load.yr.new.temp <- rbind(data.load.yr.new.temp, data.load.yr.NI)
#test <- data.load.yr.new.temp[, c(6:19)]*data.load.yr.new.temp$ratio
data.load.yr.new <- cbind(data.load.yr.new.temp[, c(1:5)], data.load.yr.new.temp[, c(6:20)]
  *data.load.yr.new.temp$ratio)
data.load.yr.new$year <- rep(year[y], dim(data.load.yr.new)[1])
data.load.new <- rbind(data.load.new, data.load.yr.new)

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#== Estimated LDC ==#

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block.MD <- rep(0, 3)
block.MD[1] <- mean(data.load.yr.MD[data.load.yr.MD$TotLoad>=cutoff.MD[1], "TotLoad"]) #High
block.MD[2] <- mean(data.load.yr.MD[data.load.yr.MD$TotLoad<=cutoff.MD[1] & data.load.yr.MD
  $TotLoad>=cutoff.MD[2], "TotLoad"]) # Midium
block.MD[3] <- mean(data.load.yr.MD[data.load.yr.MD$TotLoad<=cutoff.MD[2], "TotLoad"]) #Low

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block.ME <- rep(0, 3)
block.ME[1] <- mean(data.load.yr.ME[data.load.yr.ME$TotLoad>=cutoff.ME[1], "TotLoad"])
block.ME[2] <- mean(data.load.yr.ME[data.load.yr.ME$TotLoad<cutoff.ME[1] & data.load.yr.ME
  $TotLoad>=cutoff.ME[2], "TotLoad"])
block.ME[3] <- mean(data.load.yr.ME[data.load.yr.ME$TotLoad<=cutoff.ME[2], "TotLoad"])

block.NI <- rep(0, 3)
block.NI[1] <- mean(data.load.yr.NI[data.load.yr.NI$TotLoad>=cutoff.NI[1], "TotLoad"])
block.NI[2] <- mean(data.load.yr.NI[data.load.yr.NI$TotLoad<cutoff.NI[1] & data.load.yr.NI$TotLoad>
  =cutoff.NI[2], "TotLoad"])
block.NI[3] <- mean(data.load.yr.NI[data.load.yr.NI$TotLoad<=cutoff.NI[2], "TotLoad"])

#== Combind Block Height ==#
block.temp <- sort.col(append(append(block.MD, block.ME), block.NI), c(1), c(1), ascending=F)
block.Height <- cbind(block.Height, block.temp)
}
data.load.new$ozone <- rep(1, dim(data.load.new)[1])
name.new <- paste("c:/my stuffs/my research/epa/capacityexpansion/data/PJM_ECAR_load_90_55_05
  _NEMS1201.txt", sep="")
write.table(data.load.new, name.new, sep="\t", dimnames.write = T)

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