# 1. How many vowels are there in the names of USA States?

USArrests # data set

names(USArrests) # to know what is the column name for State names

USA\_States <- rownames(USArrests) # names of states

USA\_States <- paste(USA\_States, collapse = "") # converting the names to a string

USA\_States <- tolower(strsplit(USA\_States, "")[[1]]) # converting to lower case and spliting each letter

USA\_States <- USA\_States[USA\_States %in% letters]

(table(USA\_States)) # Frequency of each letter

distribution <- as.data.frame(table(USA\_States)) # converted to data frame

names(distribution)

colnames(distribution) <- c("letters", "Freq") # changed column names

names(distribution)

library(dplyr)

filter(distribution, letters %in% c("a","e","i","o","u"))

finding number of vowels in the names of USA States

thus there are 61 a, 28 e , 44 i , 36 o and 8 u in the names of USA States

# 2. Visualize the vowels distribution.

# type 1

vowel\_dist <- filter(distribution, letters %in% c("a","e","i","o","u"))

vowel\_dist

barplot(vowel\_dist$Freq, axes = TRUE, axisnames = TRUE, xlab = "Vowels", ylab = "frequency")

# type 2: # since we want vowel distribution, assiging colour to position of vowel

area.color <- c("withcolour",NA,NA,NA,"withcolour",NA,NA,NA,"withcolour",

NA,NA,NA,NA,NA,"withcolour",NA,NA,NA,NA,"withcolour",

NA,NA,NA,NA,NA)

area.color plot.vowel <- ggplot(data = distribution, aes(x=letters, y=Freq, fill=area.color))+ geom\_bar(stat = "identity") +

xlab(colnames(distribution)[1]) +

ylab(colnames(distribution)[2])

plot.vowel # vowel distribution is visualized with different colour