# Import BankMArketing Data

bank <- read.csv("E:/Acadgild/Class 6/Assignments/bank-additional/bank-additional.csv", sep=";")

View(bank)

dim(bank) # 4119 observations with 21 attributes

str(bank) # All have the correct class

# a. Create a visual for representing missing values in the dataset.

Sol=

psych::describe(bank)

library(VIM)

missing <- bank

missing[missing == "unknown"] <- NA

aggr(missing, col=c('blue', 'red'),

numbers=TRUE, sortvars= TRUE,

labels=names(missing), cex.axis=0.5,

gap=3, ylab=c("missing data","pattern"))

sapply(missing, function(x) sum(is.na(x)))

# b. Show a distribution of clients based on a Job.

Sol= t <- table(bank$job)

# distribution in tabular form

t

# distribution in graphical form

title <- barplot(t, xlab = "Job", ylab = "Numbers", main = "Clients based on Job",

col = heat.colors(12), las=3)

text(title, 0, t, pos = 3, srt = 90)

# c. Check whether is there any relation between Job and Marital Status?

Sol=

# Ho : There is NO association between Job and Marital Status

chisq.test(missing$job, missing$marital)

# Since P Value is less than 0.05 ,

# there is association between Job and Marital status at 95% confidence level

# Since NA values are very less, are omitted

# d. Check whether is there any association between Job and Education?

Sol=

# Ho : There is NO association between Job and Education.

chisq.test(missing$job, missing$education)

# Since the P value is less than 0.05,

# there is association between Job and Education at 95% confidence level

# Since NA values are very less, are omitted