**Homework 1**

***CISM Introductory R Course***

**Section 3: Exploration**

Now begins the “real work”. Everything before here was just preparation. You’ll need to send the code for sections 3-5 to Joe.

Answer the following questions. For an answer to be correct, you must both have the correct answer *and the correct code*.

1. How many rows are in the data? (hint: use nrow): 9000 rows

nrow(census)

1. How many columns are in the data? (hint: use ncol): 14 colums

> ncol(census)

[1] 14

1. What are the names of the columns? (hint: use colnames)

colnames(census)

[1] "latitude" "longitude" "floor\_material" "bike" "car" "pigs"

[7] "celular" "moto" "telephone" "tv" "wash\_after\_poop" "water\_source"

[13] "sex" "age"

1. Create an object called sex\_table

sex\_table <- table(census$sex)

1. How many males are in our data? **4498 males**

table(census$sex)

female male

4502 4498

1. What *percentage* of our observations are female? **50% are female**

prop.table(sex\_table)

**female** male

**0.5002222** 0.4997778

sex\_table / nrow(census)

female male

0.5002222 0.4997778

1. What is the maximum age in our data? **Maximum age is 88.8 years**

max(census$age)

[1] 88.81537

1. What is the minimum age in our data? **18 years**

min(census$age)

[1] 18.00225

1. Create a histogram of the ages of the people in our data.

hist(census$age, col = 'blue', main = 'Census age distribution',

xlab ='Age (in years)',

ylab='Frequency',

lwd =3,

lty = 4)

1. Create a barplot of the sex\_table object you created earlier.

barplot(sex\_table, col='cyan', main = 'Gender distribution')

**Section 4: More exploration**

1. Use the table function to create an object called floor\_table which tabulates the floor material of all the houses in our data.

floor\_table <- table(census$floor)

1. How many of our houses have cement floors? **7588 houses**

table(census$floor\_material)

1. What percentage of our houses have cement floors? **14.28%**

prop.table(table(floor\_table))\*100

1. Create another table called bike\_table with information about whether people have bikes or not.

bike\_table <- table(census$bike)

1. Create a barplot of bike\_table.

barplot(bike\_table, col = 'dark green', main = 'Bikes')

1. Create a new variable called “tv\_and\_car” like this:

census$tv\_and\_car <-

if else(census$tv == 'yes' & census$car == 'yes', 'Has TV and car', 'Does not have TV and car')

1. Use table to see how many people have both a TV and a car? **509 people**

table(census$tv\_and\_car)

1. Use prop.table to see what percentage of people have both a TV and a car. **50% of the people**

prop.table(table(tv\_and\_car\_table))\*100

1. Create a *two variable* table (a “cross-table”) called xt using the tv\_and\_car variable and the celular variable (hint, use the table function, but just put a comma between the variables)

xt\_table <- table(census$tv\_and\_car,census$celular)

1. Are there any people that have a TV and a car, but don’t have a cell phone? ) **No (0 persons)**

prop.table(table(census$xt\_table))

**Section 5: Mapping**

Let’s make some maps!

1. We’re going to make a map of Mozambique. This map is easily available in the cism package. It’s called moz0.

library(cism)

library(sp)

plot(moz0)

#Section 5: Mapping

library(cism)

library(sp)

plot(moz0)

plot(moz0, col = 'orange')

plot(man2)

plot(man2, col = 'green', main = "Manhica District map")

plot(man3, col = 'dark green', main = "Administrative division of Manhica")

plot(census$longitude,census$latitude, main = "Moz census coordinaes")

plot(man2)

points(census$longitude, census$latitude)

cism\_map(lng = census$longitude,

lat = census$latitude)

? cism\_map

? cism\_map\_interactive

cism\_map\_interactive(lng= census$longitude,lat = census$latitude, x = NULL, popup = NULL, spdf = NULL,

type = NULL, make\_simple = TRUE, n\_simple = 10, opacity = 0.5,

point\_size = 1)