**EXERCISE 2. DATA VISUALIZATION**

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# 1. DATA VISUALIZATION EXAMPLES

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# FOR HELP: http://www.statmethods.net/graphs/index.html

# R Graphics gallery: http://addictedtor.free.fr/graphiques/

# the command below will produce a few example plots so you

# can see what R is capable of.

# (notice on the command screen you need to press Enter to move to the next plot)

demo(graphics)

# type the commands below before you carry on, don’t worry about why!

rm(list=ls())

par(mfcol=c(1,1))

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# 2. UNIVARIATE DATA

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# Before you read in a dataset, you need to tell R which folder to look in

# In R Studio, go to SESSION, CHANGE WORKING DIRECTORY

# Select the folder where you saved the dataset.

# Read in the example dataset: MacroalgaeGenusRichness.csv.

# These data tell you the genus richness of macroalgae (seaweed!) and

# the value of some environmental variables at 354 sites.

# The extent of the dataset is global.

# These data were used for Keith et al. 2014. Global Ecology & Biogeography

# and are free to download on Figshare

mgr <- read.csv("MacroalgaeGenusRichness.csv")

# We have created an object called "mgr" that holds the data.

# Have a look at the first few rows so you know what the dataset looks like

head(mgr)

# There are many more rows than you see here, type the next command to see how many

nrow(mgr)

# For now, we will just focus on genus richness column.

# We can create a vector with these data only.

gr <- mgr$GenusRich

# View the first 20 elements (sites)

head(gr,20)

# how many sites are there in this object?

length(gr)

# draw a HISTOGRAM of a single variable

hist(gr)

# specify number of breaks

hist(gr,breaks=20)

# add a min and max value for the x axis

hist(gr,breaks=20,xlim=c(0,500))

# add main title and x axis label

hist(gr,breaks=20,xlim=c(0,500),main="Macroalgae Richness",xlab="Genus richness")

# change the colour

hist(gr,breaks=20,xlim=c(0,500),main="Macroalgae Richness",xlab="Genus richness", col="dark green")

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# 3. BIVARIATE DATA

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# plot data points by latitude and longitude

plot(mgr$Long,mgr$Lat)

# think about what this plot looks like...

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####### FOR YOUR REPORT 1 ######

####### START ######

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# How does genus richness vary with latitude?

colnames(mgr) # this will tell you what the columns are called

# Does it fit the classic latitudinal gradient pattern?

## COPY AND PASTE THIS PLOT INTO YOUR REPORT AND DESCRIBE

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####### FOR YOUR REPORT 1 ######

####### END ######

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# produce some scatterplots of the relationship between

# (a) genus richness and one environmental variable

# (b) between two environmental variables

colnames(mgr)

# Here's an example for (a)

plot(mgr$GenusRich,mgr$SST.MEAN,pch=4,col="red")

# you can replace "SST.MEAN" with the name of an alternative column

# to plot a different variable against richness

# Here's an example for (b)

plot(mgr$SST.MAX,mgr$SST.MIN,pch=1,col="blue")

# you can replace "SST.MAX" and/or "SST.MIN" with the name of an alternative column

# to plot a different variable against richness

# Look at how the environmental variables in the dataset are related

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####### FOR YOUR REPORT 2 ######

####### START ######

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## PLOT SOME SCATTERPLOTS OF OTHER VARIABLE COMBINATIONS IN THE DATASET

## Build up a nice plot by inserting extra arguments as we did above.

## Many of the arguments in the “hist” function can also be used in “plot”

colnames(mgr) # this will tell you what the columns are called

## SELECT SOME SCATTERPLOTS TO COPY AND PASTE INTO YOUR REPORT

## DISCUSS THE PLOTS

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####### FOR YOUR REPORT 2 ######

####### END ######

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