**R Lab Exercises**

1. Assume that we have registered the height and weight for four people: Heights in cm are 180, 165, 160, 193; weights in kg are 87, 58, 65, 100. Make two vectors, height and weight, with the data. The body mass index (BMI) is defined as weight in kg/(height in m)^2

Make a vector with the BMI values for the four people, and a vector with the natural logarithm to the BMI values. Finally make a vector with the weights for those people who have a BMI larger than 25.

2. Suppose we have the following three observations of temperature: 23◦C, 27◦C,19◦C. Make a vector with these values. Recall the relation between the Celsius and Fahrenheit temperature scale:

Degrees in Fahrenheit =degrees in Celsius\*9/5+32

Make a new vector with the temperatures in Fahrenheit.

3. Assume that you are interested in cone-shaped structures, and have measured the height

and radius of 6 cones. Make vectors with these values as follows:

R <- c(2.27, 1.98, 1.69, 1.88, 1.64, 2.14)

H <- c(8.28, 8.04, 9.06, 8.70, 7.58, 8.34)

Recall that the volume of a cone with radius R and height H is given by

1/3πR^2H . Make a vector with the volumes of the 6 cones.

4. Compute the mean, median and standard deviation of the cone volumes. Compute also the mean of volume for the cones with a height less than 8.5.

5. Load data from two different csv files.

Make data frames subset from those csv files using R.

Rename the headers of two data frames so that these two can be merged.

Merge multiple datasets.

Delete the last column of resultant dataset.

Add a new column as the second column of resultant dataset.

Save the final data as a csv file using write.table.

6. Consider any dataset of your choice and try to reshape this dataset using melt function in different ways.

7. Create a data frame consisting of following 4 vectors

**fy** - 2010,2011,2012,2010,2011,2012,2010,2011,2012

**company** - "Apple","Apple","Apple","Google","Google",

"Google","Microsoft","Microsoft","Microsoft"

**revenue** - 65225,108249,156508,29321,37905,50175,62484,69943,73723

**profit** - 14013,25922,41733,8505,9737,10737,18760,23150,16978

Name the data frame as **companiesData**.

Export the above data to a csv file.

Analyze that csv file using different R functions such as dim, ncol , nrow , str, min, max, subset, names etc.

8. Run the following code:

> gender <- factor(c(rep("female", 91), rep("male", 92)))

> table(gender)

> gender <- factor(gender, levels = c("male", "female"))

> table(gender)

> gender <- factor(gender, levels = c("Male", "female"))

> table(gender)

> rm(gender)

Explain the output from the final

table(gender)

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9. Sort the rows in the data frame Acmena in order of increasing values of dbh

[Hint: Use the function order(), applied to age to determine the order of row numbers required to sort rows in increasing order of age. Reorder rows of Acmena to appear in this order.]

Data frame Acmena is to be creates as follows:

> Acmena <- subset(rainforest, species == "Acmena smithii")

10. Demonstrate the use of apply,lapply and sapply and show the difference between these three functions.