DAY 2 ASSIGNMENT

1. The built-in vector LETTERS contains the uppercase letters of the alphabet. Produce a vector of

(i) the first 12 letters;

(ii) the odd ‘numbered’ letters;

(iii) the (English) consonants.

CODE:

(i)

> a<-head(LETTERS,12)

> print(a)

[1] "A" "B" "C" "D" "E" "F" "G" "H" "I" "J" "K"

[12] "L"

(ii)

> odd\_letters <- LETTERS[seq(1, length(LETTERS) ,2)]

>print(odd\_letters)

[1] “A” “C” “E” “G” “I” “K” “M” “Q” “S” “U” “W” “Y”

(iii)

> consonants = setdiff(LETTERS, c("A", "E", "I", "O", "U"))

> print(consonants)

[1] "B" "C" "D" "F" "G" "H" "J" "K" "L" "M" "N" "P" "Q" "R" "S" "T" "V" "W" "X" "Y" "Z"

2. The function rnorm() generates normal random variables. For instance, rnorm(10) gives a vector

of 10 i.i.d. standard normals. Generate 20 standard normals, and store them as x. Then obtain

subvectors of

(i) the entries in x which are less than 1;

(ii) the entries between – 0.5 and 1;

(iii) the entries whose absolute value is larger than 1.5.

CODE:

> x <- rnorm(20)

> subvector1 <- x[x < 1]

> subvector2 <- x[x > -0.5 & x < 1]

> subvector3 <- x[abs(x) > 1.5]

> print(subvector1)

[1] -0.71040656 0.25688371 -0.24669188 -0.34754260 -0.95161857 -0.04502772 -0.78490447 -1.66794194 -0.38022652

[10] 0.91899661 -0.57534696 0.60796432 -1.61788271 -0.05556197 0.51940720 0.30115336 0.10567619 -0.64070601

[19] -0.84970435 -1.02412879

> print(subvector2)

[1] 0.25688371 -0.24669188 -0.34754260 -0.04502772 -0.38022652 0.91899661 0.60796432 -0.05556197 0.51940720

[10] 0.30115336 0.10567619

> print(subvector3)

[1] -1.667942 -1.617883

3. Solve the following system of simultaneous equations using matrix methods.

a + 2b + 3c + 4d + 5e = −5

2a + 3b + 4c + 5d + e = 2

3a + 4b + 5c + d + 2e = 5

4a + 5b + c + 2d + 3e = 10

5a + b + 2c + 3d + 4e = 11

CODE:

4. Create a factor object for an apple color such as &#39;green&#39;, &#39;green&#39;, &#39;yellow&#39;, &#39;red&#39;, &#39;red&#39;, &#39;red&#39;,&#39;

green&#39;. Print the factor and applying the nlevels function to know the number of distinct

values

CODE:

> apple\_colors <- c('green', 'green', 'yellow', 'red', 'red', 'red', 'green')

>

> factor\_apple\_colors <- factor(apple\_colors)

>

> print(factor\_apple\_colors)

[1] green green yellow red red red green

Levels: green red yellow

>

> nlevels(factor\_apple\_colors)

[1] 3

5. Create an S3 object of class fruit contains a list with following required components such

as name, quantity, cost and also Define and create s4 objects.Define a reference class of

fruit

CODE:

> fruit <- function(name, quantity, cost) {

+ obj <- list(

+ name = name,

+ quantity = quantity,

+ cost = cost,

+ class = "fruit"

+ )

+ class(obj) <- "fruit"

+ obj

+ }

> # Create an instance of "fruit" object

> apple <- fruit(name = "apple", quantity = 10, cost = 2.5)

> print(apple)

$name

[1] "apple"

$quantity

[1] 10

$cost

[1] 2.5

$class

[1] "fruit"

attr(,"class")

[1] "fruit"

> # Define a reference class "fruit\_ref"

> setRefClass("fruit\_ref", fields = list(

+ name = "character",

+ quantity = "numeric",

+ cost = "numeric"

+ ))

> # Create an instance of "fruit\_ref" object

> orange <- fruit\_ref(name = "orange", quantity = 15, cost = 1.8)

Error in fruit\_ref(name = "orange", quantity = 15, cost = 1.8) :

could not find function "fruit\_ref"

> print(orange)

Error in print(orange) : object 'orange' not found