Stats 380: Assignment one

Q1:

(a)

(i) pi \* 1:100

(ii) (1:10)^2

(iii) 2^(1:100)

(iv) 1:100 \* c(1, -1, 1)

(b)

(i)

> firstbigger =

+ function(x, a)

+ which(cumsum(x) > a)[1]

> firstbigger(1:10, 7)

[1] 4

(ii)

> firstbigger =

+ function(x, a) {

+ index = NA

+ s = 0

+ for(i in seq(along = x)) {

+ s = s + x[i]

+ if (s > a) {

+ index = i

+ break

+ }

+ }

+ index

+ }

> firstbigger(1:10, 7)

[1] 4

Q2:

(a)

**#list containing the value of k and an indication of whether n\_a is odd or even**

List\_k\_evenodd=function(n)

{

n\_a=3\*n

if ((n\_a)%%2==0)

evenodd="even"

else evenodd="odd"

if (evenodd=="even") n\_b=n\_a/2

else n\_b=(n\_a+1)/2

n\_c=3\*(n\_b)

k=(n\_c)%/%9

x=list(k,evenodd)

return(x)

}

> List\_k\_evenodd(15)

[[1]]

[1] 7

[[2]]

[1] "odd"

**# reconstruct the value of n**

numberguess=function(n)

{

n\_a=3\*n

if ((n\_a)%%2==0)

evenodd="even"

else evenodd="odd"

if (evenodd=="even") n\_b=n\_a/2

else n\_b=(n\_a+1)/2

n\_c=3\*(n\_b)

k=(n\_c)%/%9

x=list(k,evenodd)

x

if(x[[2]]=="even") n=2\*x[[1]]

else n=2\*x[[1]]+1

return(n)

}

> numberguess(15)

[1] 15

Q3:

mother.tongue =

structure(

c(1000, 350, 250, 200, 150, 150, 150, 135, 120,

100, 70, 70, 65, 65, 60, 60, 55, 55, 50, 50),

names =

c("Chinese", "English", "Spanish", "Hindi", "Arabic",

"Bengali", "Russia", "Portuguese", "Japanese", "German",

"French", "Panjabi", "Javanese", "Bihari", "Italian",

"Korean", "Telugu", "Tamil", "Marathi", "Vietnamese"))

llines =

function (x, cex = 1)

lcm(2.54 \* cex \* x \* par("csi"))

strwidth.cm =

Vectorize(function(x, font = par("font"), cex = par("cex"))

2.54 \* strwidth(x, "inches", font = font, cex = cex))

dotchart =

function(x,

names.x = names(x),

font = 1,

ladj = 1,

cex = 1,

pch = 19,

col = 1,

bg = "white",

xlim = range(x, na.rm =TRUE),

xstart = par("usr")[1],

xend = if (full.lines) par("usr")[2] else x,

full.lines = FALSE,

xlab = deparse(substitute(x)),

mar = c(1, 2.1, 1, 2.1))

{

nx = length(x)

if (length(names.x) != nx)

stop("data/names length mismatch")

pch = rep(pch, length = nx)

font = rep(font, length = nx)

mar = rep(mar, length = 4)

opar = par(mfrow = c(1, 1),

mar = rep(0, 4),

cex = cex)

nw = lcm(max(strwidth.cm(names.x, font = font, cex = cex)))

gw = lcm(strwidth.cm(" ", font = 1, cex = cex))

layout(matrix(c(0, 0, 0, 0, 0,

0, 0, 0, 4, 0,

0, 0, 0, 0, 0,

0, 1, 0, 2, 0,

0, 0, 0, 0, 0,

0, 0, 0, 3, 0,

0, 0, 0, 0, 0), nc = 5, byrow = TRUE),

heights = c(llines(mar[3], cex = cex),

llines(1, cex = cex),

llines(3.1, cex = cex),

1,

llines(3.1, cex = cex),

llines(1, cex = cex),

llines(mar[1], cex = cex)),

widths = c(llines(mar[2], cex = cex),

nw,

gw,

1,

llines(mar[4], cex = cex)))

par(cex = cex)

y = 1:length(names.x) - .5

ylim = c(0, length(names.x))

plot.new()

plot.window(xlim = c(0, 1), ylim = ylim, xaxs = "i", yaxs = "i")

text(ladj, y + .0625, names.x,

font = font, cex = cex, adj = c(ladj, .5))

plot.new()

plot.window(xlim = xlim,

ylim = ylim, yaxs = "i")

segments(xstart, y, xend, y, lty = "13")

points(x, y, pch = pch, col = col, bg = bg)

axis(1, cex.axis = cex)

axis(3, cex.axis = cex)

box()

v = 0.4

plot.new()

plot.window(xlim = c(0, 1), xaxs = "i",

ylim = c(0, 1.5), yaxs = "i")

text(.5, v, xlab, adj = c(.5, 0), xpd = NA)

plot.new()

plot.window(xlim = c(0, 1), xaxs = "i",

ylim = c(0, 1.5), yaxs = "i")

text(.5, v, xlab, adj = c(.5, 0), xpd = NA)

par(opar)

}

dotchart(rev(mother.tongue),pch = 19,,xlab = "Number of Speakers (Millions)")

