

Math3346, September 26, 2006.

Assignment 3, due October 10, 2006.

Be sure to forward a pdf file that has your assignment. Please forward, in a separate file (either as text or in an R image file), the code for the two functions that are requested below.

1. Write a function that calculates the sizes of all objects in the workspace. If the number of objects is below some threshold, it should give the names of the objects, with their sizes. Otherwise it should display the distribution of object sizes graphically.
[2 marks]
2. Explain the importance of the class of an R object for the use of generic functions. Give an example, using either `plot()` or `print()`.
[1 mark]
3. Explain the different results from `class(mean)`, `class("mean")` and `class(get("mean"))`.
[1 mark]
4. Write a function that gives the numbers of objects of each different class in an R workspace.
[2 marks]
5. Laboratory exercises 7 defined and used the function `bagrisk()`. A modified version of the function is given below. It is also available from <http://www.maths.anu.edu.au/~johnm/courses/dm/math3346/functions/bagrisk.RData>. Use the R function `prompt()` to provide a skeleton for a help page for `bagrisk()`. Fill in the details. [NB: The text of the file that you create will not be checked for syntactic correctness. The purpose is rather for the content to be correct and reasonably complete.] Be sure to give at least two examples of the use of the function, and to explain why the output is “interesting”.
[4 marks]

```
"bagrisk" <-  
function(form=national ~ seatbelt + airbag, response="dead",  
        margin="airbag", marglab=c("nobag", "bag"), data=nass_cds,  
        decpl=4){  
  funtxt <- deparse(form)  
  leftrt <- strsplit(funtxt, split=" ~ ")[[1]]  
  formdead <- formula(paste(leftrt[1],"*", response, " ~ ",leftrt[2], sep=""))  
  total <- with(nass_cds, as.data.frame(xtabs(form, data=data)))  
  dead <- with(nass_cds, as.data.frame(xtabs(formdead, data=data)))  
  nc <- match("Freq", names(total))  
  nway <- nc-1  
  nair <- match(margin, names(total))  
  marglev <- levels(total[, margin])  
  if(is.null(marglab)) marglab <- marglev  
  lev1 <- with(total, total[, margin]==marglev[1])  
  lev2 <- with(total, total[, margin]==marglev[2])  
  nobag_d <- paste(marglab[1],"_", response, sep="")  
  nobag_tot <- paste(marglab[1],"_tot", sep="")  
  bag_d <- paste(marglab[2],"_", response, sep="")  
  bag_tot <- paste(marglab[2],"_tot", sep="")  
  nobagProp <- paste(marglab[1], "Prop", sep="")  
  bagProp <- paste(marglab[2], "Prop", sep="")  
  df <- cbind(dead[lev1, (1:nway)[-nair], drop=FALSE],  
             nobag_d=dead[lev1, nc],
```

```

        nobag_tot=total[lev1,nc],
        bag_d=dead[lev2, nc],
        bag_tot=total[lev2,nc],
        nobagProp=dead[lev1,nc]/total[lev1,nc],
        bagProp=dead[lev2,nc]/total[lev2,nc])
names(df)[nway:(nway+5)] <- c(nobag_d, nobag_tot, bag_d, bag_tot,
                             nobagProp, bagProp)
df$extra_resp <- df[,bag_d]-df[,bag_tot]*df[, nobagProp]
printdf <- df
numcols <- c(nobag_d, nobag_tot, bag_d, bag_tot, "extra_resp")
fraccols <- c(nobagProp, bagProp)
printdf[, numcols] <- round(printdf[, numcols])
printdf[, fraccols] <- round(printdf[, fraccols], decpl)
print(printdf)
invisible(df)
}

```