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#######################################
#### SUGGESTED EXERCISE SOLUTIONS ####
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#########
## 5.1 ##
#########
#(a)
foo <- list(seq(from=-
4,to=4,length=20),matrix(c(F,T,T,T,F,T,T,F,F),nrow=3,ncol=3),c("don","quixote"),factor(x=c("LOW","
MED","LOW","MED","MED","HIGH")))
##(i)
foo[[2]][2:1,2:3]
##(ii)
foo[[3]][1] <- sub(pattern="d",replacement="D",x=foo[[3]][1])
foo[[3]][2] <- sub(pattern="q",replacement="Q",x=foo[[3]][2])
cat("\"Windmills! ATTACK!\"\n\t-\\",foo[[3]][1]," ",foo[[3]][2],"/-",sep="")
##(iii)
foo[[1]][foo[[1]]>1]
##(iv)
which(x=foo[[4]]=="MED")
#(b)
bar <- list(facs=foo[[4]],nums=c(3,2.1,3.3,4,1.5,4.9),oldlist=foo[1:3])
##(i)
bar$facs[bar$nums>=3]
##(ii)
bar$flags <- rep(x=bar$oldlist[[2]][,3],times=2)
##(iii)
bar$nums[!bar$flags]
##(iv)
bar$oldlist[[3]] <- "Don Quixote"

#########
## 5.2 ##
#########
#(a)
dframe <-
data.frame(person=c("Stan","Francine","Steve","Roger","Hayley","Klaus"),sex=factor(x=c("M","F","
M","M","F","M")),funny=factor(x=c("High","Med","Low","High","Med","Med"),levels=c("Low","Med
","High")),stringsAsFactors=F)
dframe
#(b)
dframe$age <- c(41,41,15,1600,21,60)
dframe
#(c)
dframe <- dframe[,c(1,4,2,3)]
dframe
#(d)
mydata2 <- mydata[,-5] #(Assuming the presence of the 'mydata' object as left in Section 5.2.2)#
#(e)
mydataframe <- rbind(mydata2,dframe)
```

```
mydataframe
#(f)
mydataframe[mydataframe$sex=="F"&(mydataframe$funny=="Med"|mydataframe$funny=="High"
),c("person","age")]
#(g)
mydataframe[substr(x=mydataframe$person,start=1,stop=1)=="S",]

#########
## 6.1 ##
#########
#(a)
foo <- c(13563,-14156,-14319,16981,12921,11979,9568,8833,-12968,8133)
##(i)
foo[is.finite(foo^75)]
##(ii)
foo[-which(foo^75==-Inf)]
#(b)
bar <- matrix(c(77875.4,-35466.25,-39803.81,27551.45,-
73333.85,55976.34,23764.3,36599.69,76694.82,-36478.88,-70585.69,47032),nrow=3,ncol=4)
##(i)
which(is.nan(bar^65/Inf),arr.ind=T)
##(ii)
bar[!is.nan(bar^67+Inf)]
bar[bar^67!=-Inf]
##(iii)
bar[bar^67==-Inf|is.finite(bar^67)]

#########
## 6.2 ##
#########
#(a)
foo <- c(4.3,2.2,NULL,2.4,NaN,3.3,3.1,NULL,3.4,NA)
##(i)
length(x=foo)
##(ii)
which(x=is.na(x=foo))
##(iii)
is.null(x=foo)
##(iv)
is.na(x=foo[8])+4/NULL
#(b)
bar <- list(c(7,7,NA,3,NA,1,1,5,NA))
##(i)
names(bar) <- "alpha"
##(ii)
is.null(x=bar$beta)
##(iii)
bar$beta <- which(x=is.na(x=bar$alpha))
bar
```

```
#########
## 6.3 ##
#########
#(a)
##(i)
foo <- array(data=1:36,dim=c(3,3,4))
foo
class(foo)
attributes(foo) #explicit
##(ii)
bar <- as.vector(foo)
bar
class(bar)
attributes(bar) #implicit
##(iii)
baz <- as.character(bar)
baz
class(baz)
attributes(baz) #implicit
##(iv)
qux <- as.factor(baz)
qux
class(qux)
attributes(qux) #explicit
##(v)
quux <- bar+c(-0.1,0.1)
quux
class(quux)
attributes(quux) #implicit
#(b)
foo.sum <- is.numeric(foo)+is.integer(foo)
bar.sum <- is.numeric(bar)+is.integer(bar)
baz.sum <- is.numeric(baz)+is.integer(baz)
qux.sum <- is.numeric(qux)+is.integer(qux)
quux.sum <- is.numeric(quux)+is.integer(quux)
myfac <- factor(x=c(foo.sum,bar.sum,baz.sum,qux.sum,quux.sum),levels=c(0,1,2))
myfac
as.numeric(myfac)
#(c)
foo <- matrix(data=2:13,nrow=3,ncol=4)
foo
as.character(as.vector(t(foo)))
#(d)
foo <- cbind(c(34,23,33,42,41),c(0,1,1,0,0),c(1,2,1,1,2))
foo
##(i)
foo <- as.data.frame(foo)
foo
##(ii)
foo[,2] <- as.logical(foo[,2])
foo
```

```
##(iii)
foo[,3] <- as.factor(foo[,3])
foo
foo$V3
```