Party Preference - Star Plots

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First the party preference data are built, then they are transformed to a data set that will be used for the multinomial response models. The data include party preference, age in four categories and gender.

```
partypref <- matrix(data=c(114, 10, 53, 224,134,9,42,226,114,8,23,174,339,30,13,
414,42,5,44,161,88,10,60,171,90,8,31,168, 413,23,14,375), nrow=8, byrow=TRUE)

partydat<-data.frame(
party=c(rep("CDU",sum(partypref[,1])),rep("SPD",sum(partypref[,4])),
rep("The Liberals",sum(partypref[,2])),rep("The Greens",sum(partypref[,3]))),
sex=c(rep(0,sum(partypref[1:4,1])),rep(1,sum(partypref[5:8,1])),
rep(0,sum(partypref[1:4,4])),rep(1,sum(partypref[5:8,4])),
rep(0,sum(partypref[1:4,2])),rep(1,sum(partypref[5:8,2])),
rep(0,sum(partypref[1:4,3])),rep(1,sum(partypref[5:8,3]))),
age=c(rep(c(1:4,1:4), partypref[,1]),rep(c(1:4,1:4), partypref[,4]),
rep(c(1:4,1:4), partypref[,2]),rep(c(1:4,1:4), partypref[,3])))
```

Now star plots are to be built. For every subgroup of male/female and old/young (categories "1" and "4") a star will be plotted.

First the corresponding relative frequencies for the subgroups are computed. Then they are multiplied by a factor of 6 in order to obtain larger values for the plots.

```
x1 <- partypref/rowSums(partypref)

x1 <- x1[c(1,4,5,8),]

x1 <- cbind(x1[,2],x1[,3],x1[,1],x1[,4])

x1 <- x1*6
```

The locations for the plots are defined and the library "grDevices" is loaded.

```
loc1 <- matrix(data=c(0,0,15,0,0,15,15,15),ncol=2,byrow=T)
library(grDevices)
```

Now the stars are plotted by the command "stars".

```
stars(x1, scale=FALSE,key.loc = c(25,6),len=2,cex=1.2,lwd=1.2,
xlim=c(-10,30),ylim=c(-5,10),key.labels=c("Liberals","Green","CDU","SPD"),
location=loc1, labels = c("male young","male old","female young","female old"))
```

In the following a star plot for the exponentials of a multinomial model is plotted. First the model is fitted with the command "multinom" from "nnet"–package.

```
partydat$age <- as.factor(partydat$age)

library(nnet)

partymult <- multinom(party ~ sex + age , data=partydat)

summary(partymult)
```

The exponentials of the model coefficients and the coefficients for the reference category "CDU" are used to build the matrix "x2" of the values needed for the star plot. In addition the locations for the respective stars are defined.

```
x2 <- matrix(data=c(rep(1,5),as.matrix(t(exp(coefficients(partymult))))),nrow=5)

x2 <- cbind(x2[,4],x2[,3],x2[,1],x2[,2])

loc2 <- matrix(data=c(0,9,9,9,0,0,9,0,18,0),ncol=2,byrow=T)
```

Finally the stars can be plotted. The options "key.loc" and "key.labels" set the coordinates and the labels for the unit key.

```
stars(x2, scale=FALSE,key.loc = c(18,9),len=2,cex=1.2,lwd=1.2,
xlim=c(-2,23),ylim=c(-3,10),key.labels=c("Liberals","Green","CDU","SPD"),
location=loc2, labels = c("reference","gender","age 2","age 3","age 4"))
```