Party Preference - Star Plots

February 1, 2012

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

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.

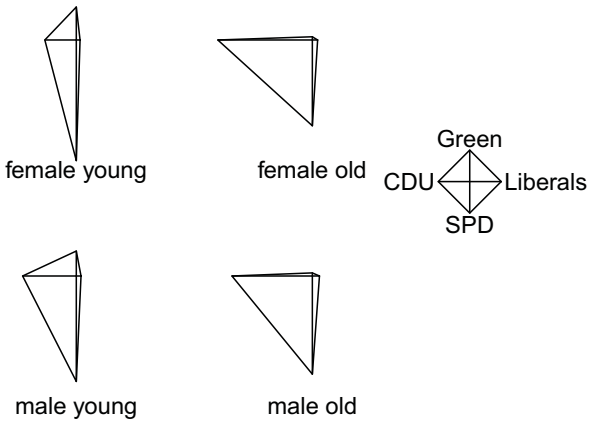
```
> x1 <- partypref/rowSums(partypref)
> x1 <- x1[c(1,4,5,8),]
> x1 <- cbind(x1[,2],x1[,3],x1[,1],x1[,4])
> x1 <- x1*6
```

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,
```



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)

# weights:  24 (15 variable)
initial  value 5032.248531
iter  10 value 3849.417371
iter  20 value 3504.626402
final  value 3502.767021
converged

> summary(partymult)

Call:
multinom(formula = party ~ sex + age, data = partydat)

Coefficients:
             (Intercept)          sex       age2       age3       age4
SPD            0.9056229 -0.006059233 -0.3217013 -0.3860963 -0.8544543
The Greens    -0.6567882  0.429086922 -0.3288184 -0.8988397 -2.9109634
The Liberals  -2.3090930 -0.091617470 -0.1106247 -0.1937725 -0.2977486

Std. Errors:
             (Intercept)        sex      age2      age3      age4
```

```
SPD           0.09867139 0.07269104 0.1266874 0.1299572 0.1081825
The Greens    0.14344965 0.13698701 0.1767448 0.2012994 0.2358490
The Liberals  0.28000513 0.20667029 0.3610925 0.3754016 0.3067292

Residual Deviance: 7005.534
AIC: 7035.534
```

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(-3,1
```