

## Computer Lab 6: Proportional Odds Models

### Motivating example:

```
library(nnet)
library(MASS)
freq=c(0,0,1,7,8,8,19,8,1,6,9,12,11,7,6,1,0,0,1,1,6,8,23,7,5,1,0,0,0,0,1,3,7,14,16,11)
response=factor(rep(c(1:9),4))
type=rep(c("a","b","c","d"),c(9,9,9,9))
cheese.data=data.frame(response,type,freq)
cheese.plr=polr(response~type,weight=freq,data=cheese.data)
summary(cheese.plr)
```

### Example:

Using a six-point scale, subjects indicated their preference for black olive.

Urbanization	Location	Preference					
		A	B	C	D	E	F
Urban	MW	20	15	12	17	16	28
	NE	18	17	18	18	6	25
	SW	12	9	23	21	19	30
Rural	MW	30	22	21	17	8	12
	NE	23	18	20	18	10	15
	SW	11	9	26	19	17	24

In this data, **Preference** is an **ordinal** response with categories (A, B, C, D, E, F), **Urbanization** and **Location** are two explanatory variables. Please use proportional odds model to fit the above data. What is the conclusion? Note that A → F: dislike extremely → like extremely.

[code:]

```
library(nnet)
library(Mass)
location=factor(rep(c("mw","ne","sw"),12))
preference=factor(rep(c("a","b","c","d","e","f"),each=6))
urban=factor(rep(c("urban","rural"),each=3,length.out=36))
freq=c(20,18,12,30,23,11,15,17,9,22,18,9,12,18,23,21,20,26,17,18,21,17,18,19,
      16,6,19,8,10,17,28,25,30,12,15,24)
olive.data=data.frame(urban,location,preference,freq)
olive.plr=polr(preference~location+urban,data=olive.data,weight=freq)
summary(olive.plr)
```