Ex3

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#q3- chapter 3:  
library(MASS)  
library(nnet)  
Sex = factor(c(rep(c("Male" , "Female") , c(128,22)),  
 rep(c("Male" , "Female") , c(125,23))))  
Darman = factor(rep(c("Motevali" , "Dore-b-Dore"),c(150,148)))  
response = factor(c(rep(c("pishrafte\_bimari" ,"bedone\_taghir" , "behbode\_andak" , "behbode\_kamel") , c(28,45,29,26)),  
 rep(c("pishrafte\_bimari" ,"bedone\_taghir" , "behbode\_andak" , "behbode\_kamel") , c(3,12,5,2)),  
 rep(c("pishrafte\_bimari" ,"bedone\_taghir" , "behbode\_andak" , "behbode\_kamel") , c(41,44,20,20)),  
 rep(c("pishrafte\_bimari" ,"bedone\_taghir" , "behbode\_andak" , "behbode\_kamel") , c(12,7,3,1))))  
  
table(response , Sex , Darman)

## , , Darman = Dore-b-Dore  
##   
## Sex  
## response Female Male  
## bedone\_taghir 7 44  
## behbode\_andak 3 20  
## behbode\_kamel 1 20  
## pishrafte\_bimari 12 41  
##   
## , , Darman = Motevali  
##   
## Sex  
## response Female Male  
## bedone\_taghir 12 45  
## behbode\_andak 5 29  
## behbode\_kamel 2 26  
## pishrafte\_bimari 3 28

response = relevel(response,"bedone\_taghir")  
Sex = relevel(Sex , "Male")  
Darman = relevel(Darman , "Motevali")  
  
m1 <- polr(response ~ Sex + Darman ,  
 Hess = TRUE , method = "logistic")  
summary(m1)

## Call:  
## polr(formula = response ~ Sex + Darman, Hess = TRUE, method = "logistic")  
##   
## Coefficients:  
## Value Std. Error t value  
## SexFemale -0.1097 0.3031 -0.3618  
## DarmanDore-b-Dore 0.4118 0.2107 1.9540  
##   
## Intercepts:  
## Value Std. Error t value  
## bedone\_taghir|behbode\_andak -0.3917 0.1608 -2.4362  
## behbode\_andak|behbode\_kamel 0.3943 0.1590 2.4792  
## behbode\_kamel|pishrafte\_bimari 1.1242 0.1720 6.5370  
##   
## Residual Deviance: 793.478   
## AIC: 803.478

m2 <- polr(response ~ Sex \* Darman ,  
 Hess = TRUE , method = "logistic")  
summary(m2)

## Call:  
## polr(formula = response ~ Sex \* Darman, Hess = TRUE, method = "logistic")  
##   
## Coefficients:  
## Value Std. Error t value  
## SexFemale -0.7299 0.4331 -1.685  
## DarmanDore-b-Dore 0.2361 0.2265 1.042  
## SexFemale:DarmanDore-b-Dore 1.2940 0.6221 2.080  
##   
## Intercepts:  
## Value Std. Error t value  
## bedone\_taghir|behbode\_andak -0.4821 0.1664 -2.8965  
## behbode\_andak|behbode\_kamel 0.3115 0.1635 1.9049  
## behbode\_kamel|pishrafte\_bimari 1.0499 0.1754 5.9867  
##   
## Residual Deviance: 789.0436   
## AIC: 801.0436

#q3- chapter 4:  
library(nnet)  
  
hezb <- factor(c(rep(c("demokrat" , "jomhori\_khah" , "mostaghel") , c(132,176,127)) ,   
 rep(c("demokrat" , "jomhori\_khah" , "mostaghel") , c(42,6,12)) ,  
 rep(c("demokrat" , "jomhori\_khah" , "mostaghel") , c(172,129,130)) ,   
 rep(c("demokrat" , "jomhori\_khah" , "mostaghel") , c(56,4,15))))  
race = factor(c(rep(c("white" , "black"),c(435 , 60)) ,  
 rep(c("white" , "black"),c(431 , 75))))  
Sex <- factor(rep(c("Male" , "Female") , c(495 , 506)))  
  
  
df <- data.frame(hezb , race , Sex)  
df$hezb = relevel(df$hezb , ref ="jomhori\_khah")  
levels(df$hezb)

## [1] "jomhori\_khah" "demokrat" "mostaghel"

m1 <- multinom(hezb ~ . , data = df )

## # weights: 12 (6 variable)  
## initial value 1099.710901   
## iter 10 value 1042.891210  
## final value 1042.891187   
## converged

summary(m1 , correlation = FALSE , Wald = TRUE)

## Call:  
## multinom(formula = hezb ~ ., data = df)  
##   
## Coefficients:  
## (Intercept) racewhite SexMale  
## demokrat 2.565348 -2.278129 -0.5727621  
## mostaghel 1.177108 -1.159850 -0.3525711  
##   
## Std. Errors:  
## (Intercept) racewhite SexMale  
## demokrat 0.3436667 0.3427936 0.1575208  
## mostaghel 0.3806626 0.3801251 0.1650885  
##   
## Value/SE (Wald statistics):  
## (Intercept) racewhite SexMale  
## demokrat 7.464638 -6.645774 -3.636105  
## mostaghel 3.092261 -3.051233 -2.135650  
##   
## Residual Deviance: 2085.782   
## AIC: 2097.782