Duration of Unemployment - Logit Model

January 25, 2024

At first the "unemployment" data from the "catdata" package are loaded and attached.

```
library(catdata)
data(unemployment)
attach(unemployment)
```

Now a frequency table is created and used to fit a Logit model based on grouped data.

```
durbin <- as.factor(durbin)
table.durbin <- ftable(subset(unemployment, select=c("age", "durbin")),
col.vars="durbin")
rels<-table.durbin[,1]/rowSums(table.durbin)
age.new <- min(age):max(age)

model1 <- glm(table.durbin ~ age.new, family=binomial)
summary(model1)
```

Here the observed frequencies are plotted against the fitted probabilities.

```
plot(age.new, model1$fitted.values, xlab="Age", ylab="Observed/Fitted values",
type="l", ylim=c(0,1))
points(age.new,table.durbin[,1]/rowSums(table.durbin))
```

The standardized deviance residuals are plotted against the predicted values and a quantile plot is created.

```
plot(model1$fitted.values,sqrt(rowSums(table.durbin))*rstandard(model1),
xlab="Predicted values", ylab="Residuals")


qqnorm(sqrt(rowSums(table.durbin))*rstandard(model1), main="",
      ylab="Standardized deviance residuals")
qqline(sqrt(rowSums(table.durbin))*rstandard(model1), lwd=2.5,
      lty="dashed", col="red")
```