Insolvency - (Quasi-)Poisson Model and Negative Binomial Model

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First the insolvency data are loaded:

```
> library(catdata)
> data(insolvency)
> attach(insolvency)
```

For the number of insolvent firms between 1994 and 1996 a Poisson model is fitted with time as predictor. Time is considered as a number from 1 to 36, denoting the month from January 1994 to December 1996.

```
> ins1 <- glm(insolv ~ case + I(case^2), family=poisson(link=log), data=insolvency)
> summary(ins1)
> # plot(ins1)
```

Scatter-Plot of number of insolvent firms dependent of the month (1-36). With estimated curve of the log-linear model.

```
> plot(case, insolv)
> points(ins1$fitted.values, type="l")
```

In many real-world datasets the variance of count-data is higher than predicted by the Poisson distribution. So next a Poisson model with disperison parameter is fitted (Quasi-Poisson model).

```
> ins2 <- glm(insolv ~ case + I(case^2), family=quasipoisson, data=insolvency)
> summary(ins2)
> # plot(ins2)
```

An alternative to a quasi-poisson model is to use the negative binomial distribution.

```
> library(MASS)
> ins3 <- glm.nb(insolv ~ case + I(case^2),data=insolvency)
> summary(ins3)
```

Since counts are rather large in addition a normal distribution model is fitted.

```
> ins4 <- glm(insolv ~ case + I(case^2), family=gaussian(link=log), data=insolvency)
> summary(ins4)
```