

第 15 章例题写法

Methods and assumption Checks

As the response variable is the number of fish caught in the codend from a known number of fish observed in the fork. We have therefore fitted a generalised linear model with a binomial response distribution. We have one explanatory variable Fork Length (Numeric). The plot of the retention proportions shows an obvious association with length. We fitted a logistic regression model to these data.

Taking into account that we expect small positive residuals from length classes with high retention probability, the residual plot from fitting the binomial model showed no strong trends. The check of residual deviance had $P\text{-value} = 0.91$. We can trust the results from this binomial model.

Our final model is

$$\log(\text{Odds}_i) = \beta_0 + \beta_1 \times \text{length}_i,$$

where Odds_i is the odds of retention at fork length i .

Executive Summary

How does increasing the length of the fork affect the odds of fish caught in the trawl codend?

We estimate that every 1 cm increase in the fork length of a haddock corresponds to an increase in odds of it being retained in the codend of between 30% and 42%.