ANLY 545- Homework #2

Source: "Discrete Data Analysis with R" By: Michael Friendly

Exercise 3.1 The `Arbuthnot` data in HistData also contains the variable `Ratio`, giving the ratio of male to female births.

(a) Make a plot of `Ratio` over `Year`. What features stand out? Which plot do you prefer to display the tendency for more male births?

(b) Plot the total number of christenings, `Males + Females` or `Total` (in 000s) over time. What unusual features do you see?

Exercise 3.3 Use the data set `WomenQueue` to:

(c) Make a reasonable plot showing departure from the binomial distribution.

(d) Suggest some reasons why the number of women in queues of length 10 might depart from a binomial distribution, Bin(n = 10, p = 1/2).

Exercise 3.4 Work on the distribution of male children in families in "*Saxony*" by fitting a binomial distribution, $in(n = 12, p = \frac{1}{2})$, specifying equal probability for boys and girls. [*Hint*: you need to specify both `size` and `prob` values for `goodfit ().`]

(a) Carry out the GOF test for this fixed binomial distribution. What is the ratio of χ^2/df? What do you conclude?

(b) Test the additional lack of fit for the model $Bin(n = 12, p = \frac{1}{2})$ compared to the model $Bin(n = 12, p = \hat{p})$ where $\hat{p}$ is estimated from the data.

(c) Use the `plot.goodfit ()` method to visualize these two models.