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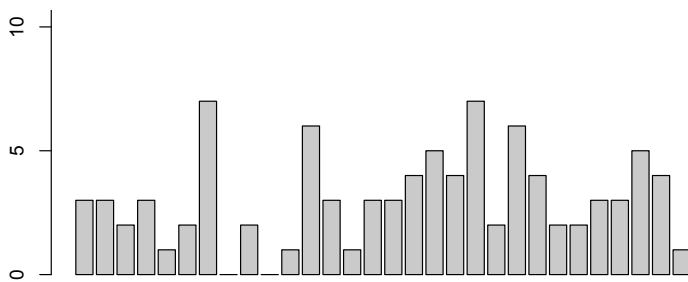University of Freiburg, Germany

Exercise No. 8

July 10, 2009

Task 1 *Empirical distributions*

You observe the remote access to your server for 30 min and count the requests for each minute. The result is the following:

minute: 1 . . . . 10 . . . . 20 30
requests: 3 3 2 3 1 2 7 0 2 0 1 6 3 1 3 3 4 5 4 7 2 6 4 2 2 3 3 5 4 1

1. Calculate mean, median and quartiles for the number of students per minute. Calculate the empirical distribution function.

2. Does this data fit to a distribution you know? Show the goodness of fit graphically.

3. Perform a χ^2 test of the sample data and a Poisson distribution.

Task 2 *Arrival processes*

Assume that the arrival of students in the cafeteria follows a Poisson process and that 3 students arrive on average per minute.

1. You decide to eat there if it is likely (let's say with probability of more than 0.75) that the number of students arriving per minute is less than 5. Will you go there?

2. What is the probability that more than 10 students arrive?

3. Plot the probability mass function and the cumulative distribution function.