In-class exercise week 3
Topic: model choice, confidence interval

Model choice:
Assign appropriate probability distributions or models to the described random variable.

a) In a 24-hour medical practice at each full hour the number of patient during the last hour is counted. Measurement of interest: number of patient per hour.
□ Binomial **x** Poisson □ Bernoulli □ Other

b) The success rate of a penalty kick is 75%.
Measurement of interest: The number of scored penalties within 10 tries (there was a goal):
x Binomial □ Poisson □ Bernoulli □ Other

c) A company reports for the last 10 years 122 sick leaves with durations of >2months due to bore-outs.
Measurement of interest: Number of bore-outs-leaves >2months in the next year.
□ Binomial **x** Poisson □ Bernoulli □ Other

d) In a package with 100 screws 10 are defect.
Measurement of interest: Number of defect screws in a sample of 20 randomly picked screws (screw is put back after checking).
x Binomial □ Poisson □ Bernoulli □ Other

e) The publisher knows that on average 20 pages of a book contains 1 typo.
Measurement of interest: Number of typos in a book of 250 pages.
□ Binomial **x** Poisson □ Bernoulli □ Other

f) A paternity test may conclude if a potential child's father is the biological father.
On average 60% of all conducted tests turn out positive.
Measurement of interest: Does a randomly picked test turn out positive?
□ Binomial □ Poisson **x** Bernoulli □ Other

g) The sources of X-rays of a X-ray apparatus are controlled each 2 years.
Measurement of interest: Number of control until a source is fails the test.
□ Binomial □ Poisson □ Bernoulli **x** Other

Confidence Interval:

With a confidence interval we can decide:
Is there a significant difference to a postulated value θ_0 ?
Is the difference relevant (>Δ)?