Lecture 9: Normal Approximation

Chapter 3.2

Goals for Today

- Discuss how to find %'iles for negative values of z
- Examples
- Evaluating how "normal" certain data are.

Solving Normal Questions

Whenever solving questions of this sort ALWAYS draw a rough picture first and keep in mind:

1. The normal distribution/curve is symmetric
2. The total area under the curve is 1

Normal Probability Tables

Alternatively, whereas

- table on P.409 gives areas to the left of positive values of z.
- table on P.408 gives areas to the left of negative values of z.

I'm only going to give you P.409 table for exams.

Speeding on I-5

The distribution of passenger vehicle speeds traveling on Interstate 5 Freeway (I-5) in California is nearly normal with a mean of 72.6 mph and a standard deviation of 4.78 mph.

a) What percent of passenger vehicles travel slower than 80 mph?

b) What percent of passenger vehicles travel between 60 and 80 mph?

c) How fast to do the fastest 5% of passenger vehicles travel?

d) The speed limit on this stretch of the I-5 is 70 mph. Approximate what percentage of the passenger vehicles travel above the speed limit on this stretch of the I-5.

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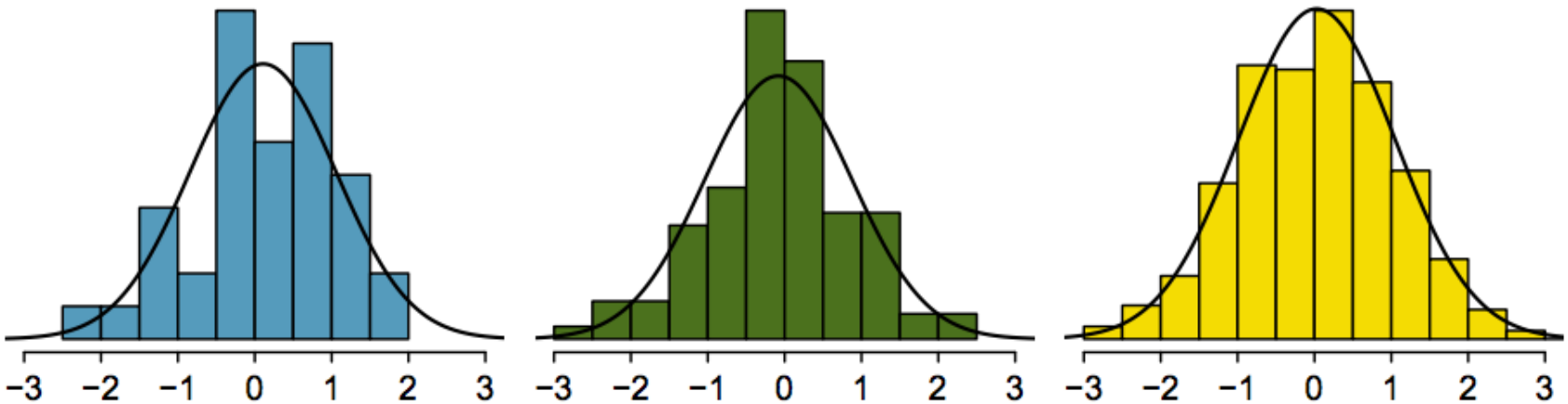
Question: How do we verify normality?

Normal Approximation

What about these ones? How well do the histograms fit to the normal curve?



Normal Probability Plots

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- The 4-quantiles are the quartiles.
- The 100-quantiles are the percentiles.

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- The theoretical quantiles that are exactly normal (on the x-axis)

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The more "normal" the data is, the better the fit.

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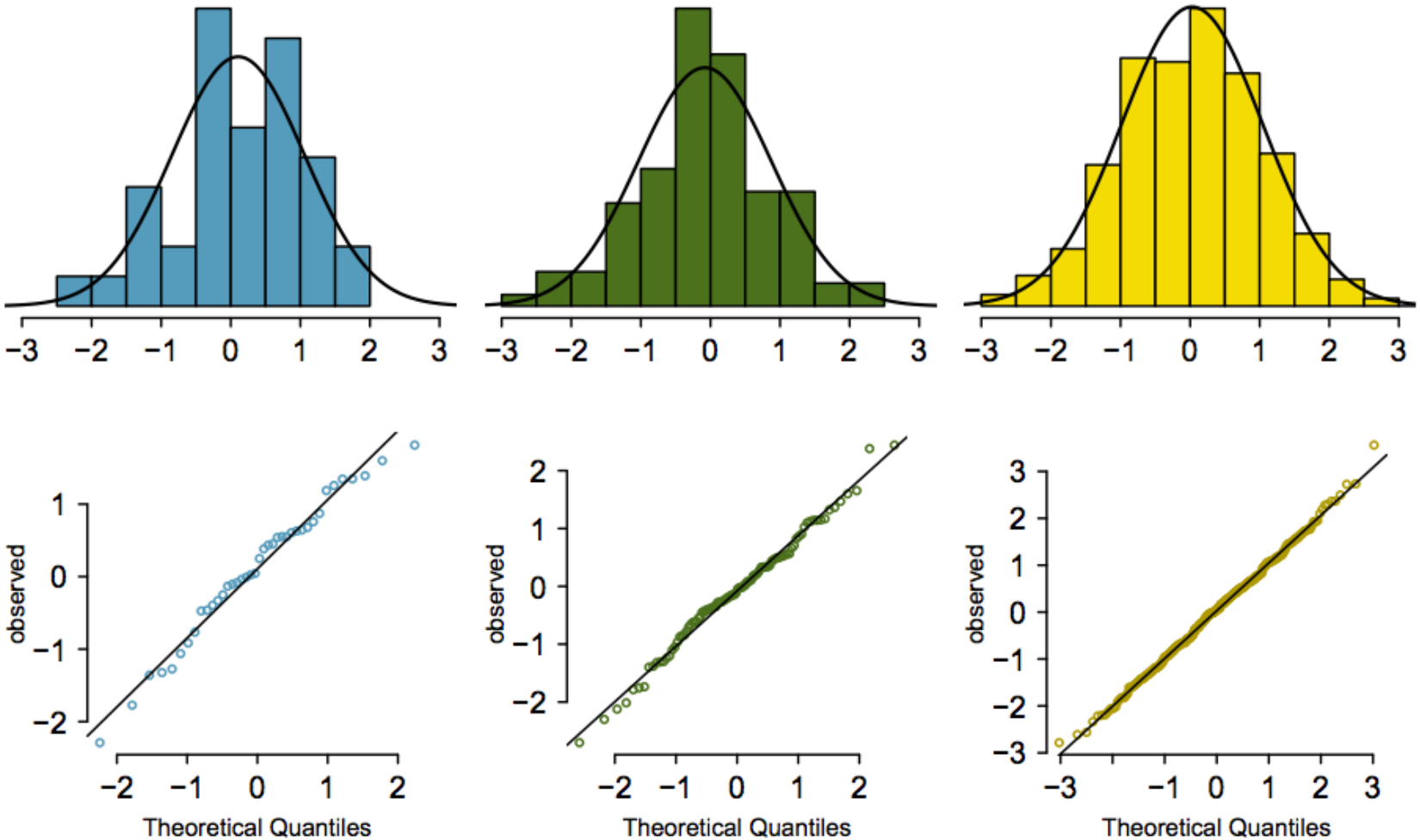

Next Time

- Introduce some of the more useful other distributions: Bernoulli, Geometric, Binomial, and Poisson