

STAT 436 / 536 - Lecture 1

August 27, 2018

Prediction Intervals Recap

436/536: Define a 95 percent prediction interval.

First, this is an interval for an observed value, rather than the mean value that confidence intervals are concerned with. If you use a Bayesian paradigm, it is permissible to say, “the interval will contain the next value with probability = .95”. Otherwise, this is a long-term frequency idea where 95% of constructed intervals will contain the observed value

536: In words describe: $p(Y_{t+1}|Y_{1:t})$.

This is a predictive distribution for the response at time $t + 1$, given that Y has been observed from time 1 to t .

Time Series Forecasting Exercise

For the following exercises, you will be asked to forecast future observed values. Rather than a point estimate, you will also be asked for 95 percent prediction intervals as a major goal in my classes is to think in terms of distributions, particularly when considering uncertainty.

This will be a competition, where the goal is to have the lowest cumulative score. The score will be a linear function of the specified width of your prediction intervals. Scoring specifics will be given for each situation below, but if your prediction intervals do not contain the requested values, the penalty will be 500.

Scoring for prediction interval width:

- Lake Huron: width * 100
- Nile River: width
- Airline Passengers: width

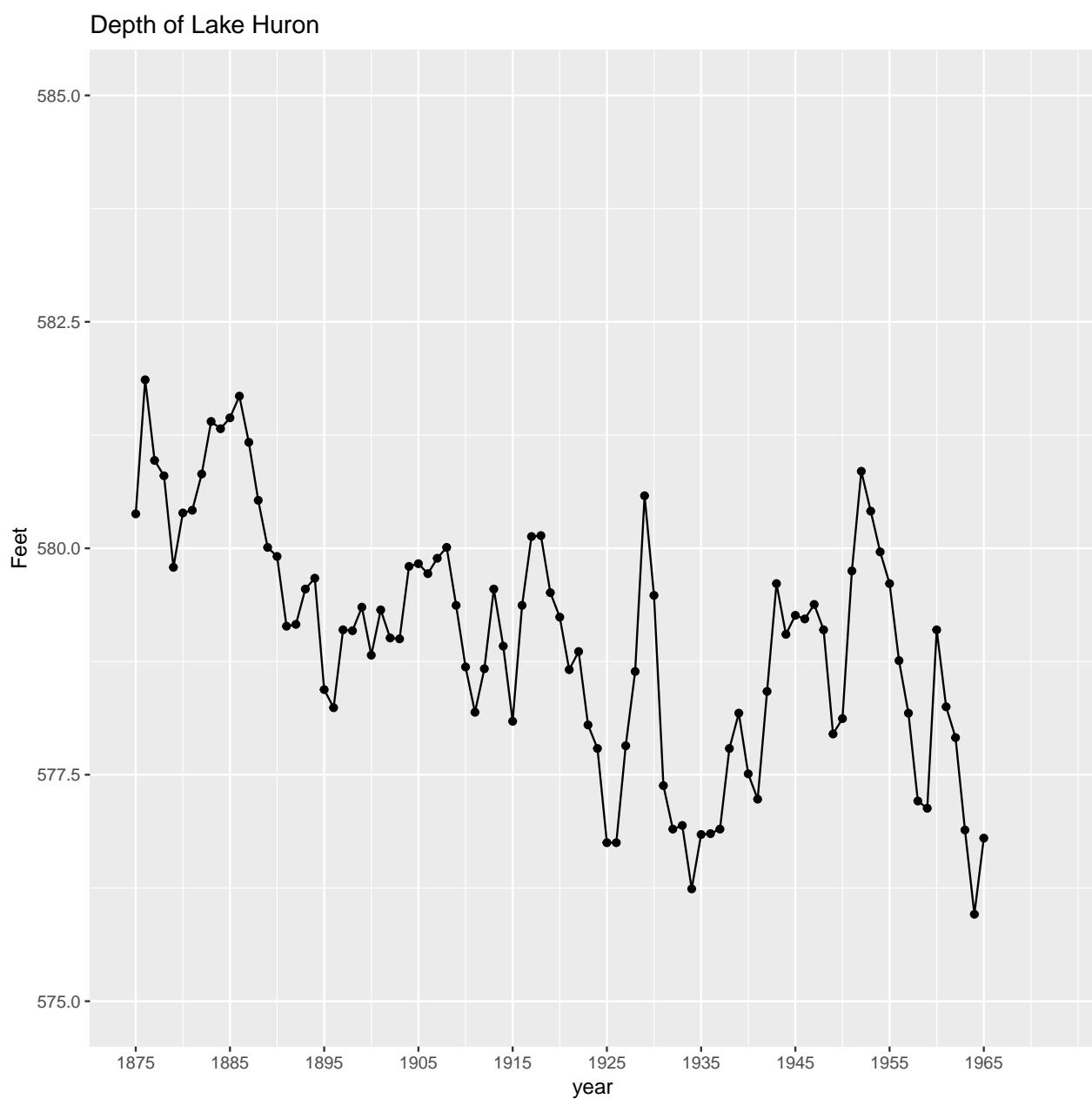
In each situation, consider the following questions:

1. What did you use to make predictions?
2. Did the level of uncertainty differ between the predictions, if so why?

Lake Huron Depth

Predict the depth of Lake Huron in feet, or more specifically a prediction interval, for:

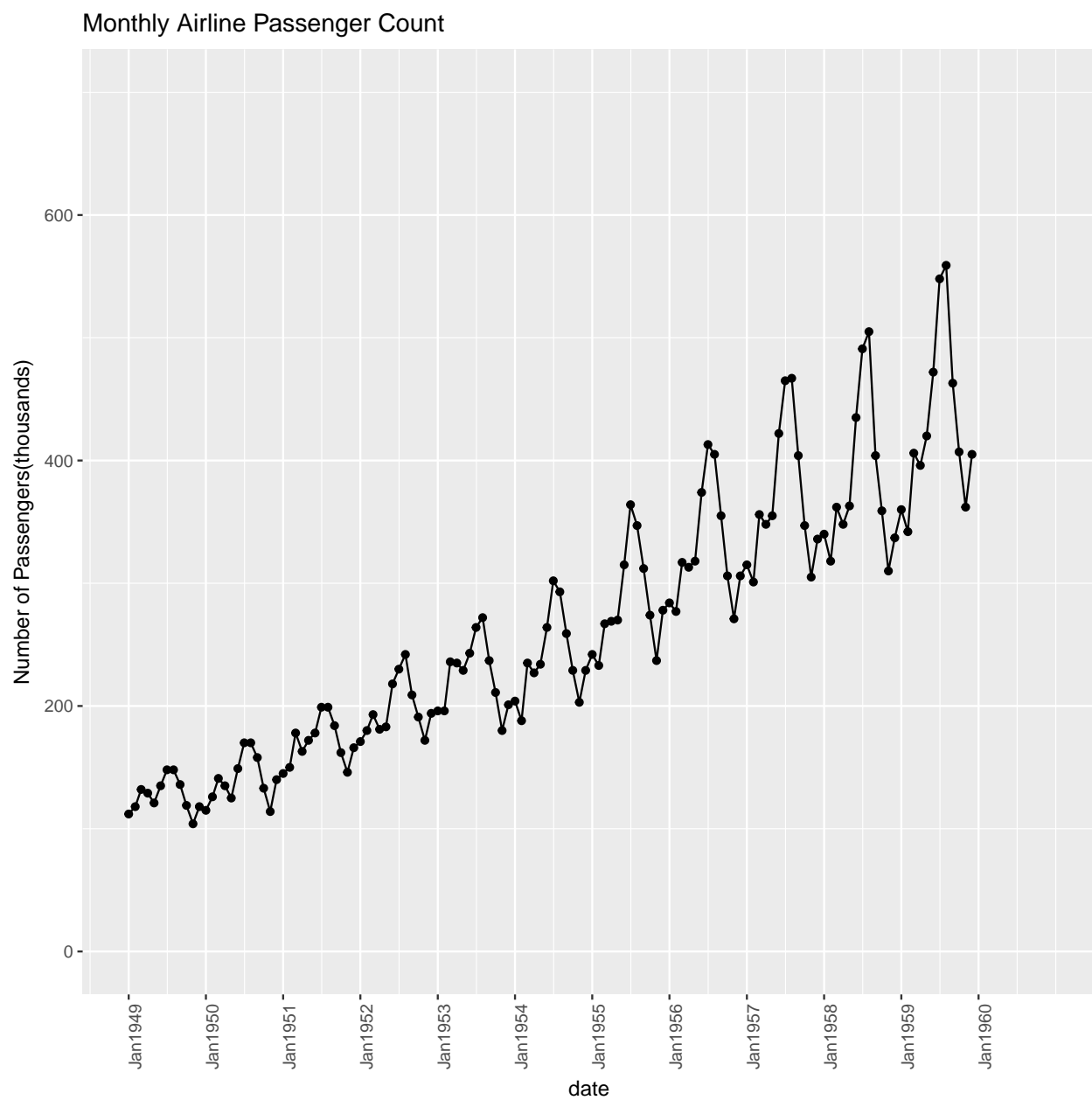
1. 1966: 577.68
2. 1970: 579.31
3. 1972: 579.62



Airline Passengers

Predict airline passenger counts in thousands, or more specifically a prediction interval, for:

1. January 1960: 417
2. July 1960: 622
3. December 1960: 432



Nile River Flow

Predict Nile flow in million cubic meters, or more specifically a prediction interval, for:

1. 1911: 831
2. 1913: 456
3. 1916: 1120

