

Answers to reading check #7

1. What's Laplace's Demon?

The theory that we could extrapolate from the present to predict the future, if only we had perfect knowledge of all present conditions.

2. True or false: When the Weather Channel thinks there's about a 5% chance of rain tomorrow, it will report a 5% chance of rain tomorrow.

False. To avoid false negatives, they're conservative and predict about a 20% chance in this range.

3. Today's best computer models, when predicting the weather three days out, are:

- better than a guess based purely on climatology
- about the same as a guess based purely on climatology
- worse than a guess based purely on climatology

(Not surprisingly.)

4. A weather simulation is representing our three-dimensional atmosphere as it evolves over time. How much more computing processing power do we need if we want to double the resolution of its forecast?

16 times as much, since there are four dimensions (three space and one time), each of which needs to be doubled in resolution.

5. True or false: The term "chaos theory" as applied to weather predictions essentially refers to the fact that there is innate *randomness* present in the system.

False. It just means that certain types of (deterministic) systems are very sensitive to small changes in their initial conditions, and so they're hard to predict.

6. True or false: When so-called human "experts" on the weather add their powers of intuition and interpretive vision to a quantitative, data-driven, computer-simulation-based forecast, they tend to worsen its accuracy.

False. Human thinkers, with their abstract and visual reasoning, have improved the NWS precipitation forecasts by about 25% over computer-only forecasts. As per usual, foxy (multiple models / sources of input) is better than hedgehoggy.

...over...

7. Today's best computer models, when predicting the weather fifteen days out, are:
- better than a guess based purely on climatology
 - about the same as a guess based purely on climatology
 - worse than a guess based purely on climatology

Surprisingly! You'd think they'd be no better, but they're actually *worse*. Silver thinks this is probably due to feedback loops within prediction systems, amplifying noise.

8. True or false: When the Weather Channel reports a 75% chance of rain tomorrow, you can expect that there's about a 75% chance it will rain tomorrow. **True. In this range, the Weather Channel reports accurate results.**