CS9: Numbers Quiz

This week, you should work in pairs. Write BOTH partners' information on ONE sheet, here:

NAME 1: _____ SUNET 1: _____

NAME 2: _____ SUNET 2: _____

Exercise: Systems Estimation and Scalability

For each of the following, guess/estimate the correct **order of magnitude (*very* rough estimate)** of the quantity. Then, as a pair, google to find the answer. You may need to make assumptions or disambiguate on your own ("What *kind* of laptop?"), so go ahead and do that and note them in the Remarks.

Don't despair if you feel in the dark about many of these! We are including Google in the loop this time because we expect that will be the case.

Inspiration for this activity (and useful resource for solving it): Numbers Every Programmer Should Know[1]

Quantity 1	**GUESS** ***("smaller than any of these" or "bigger than any of these" are also options)***	**Remarks** **(Research quick notes, and note if your guess was correct or not—no changing your guess after Googling!)**
2^{10} (2^{20}? 2^{30}?) *(Note: it is very useful to have all of the first 10 powers of 2 memorized, and then 2^{20} and 2^{30} memorized as ballpark figures)*	• thousands • millions • billions • trillions	
Time to send a piece of data (one packet) to a satellite and back to earth (e.g., imagine sending an email to a friend back home from an airplane that uses satellite to support its wifi).	• ps • ns • µs • ms • s	

[1] http://www.eecs.berkeley.edu/~rcs/research/interactive_latency.html

Time to send a piece of data (one packet) across the United States and back (e.g., imagine web request to a web server in NY).	• ps • ns • µs • ms • s	
Time to add two integers on a standard-ish desktop machine.	• ps • ns • µs • ms • s	
Time to read one integer from SSD. (What about reading 1MB?)	• ps • ns • µs • ms • s	
Time to read one integer from disk. (What about reading 1MB?)	• ps • ns • µs • ms • s	
What is the largest number that can be stored in an “int”?	• thousands • millions • billions • trillions	
Could you use “int” data type to store phone numbers (take out the “-“ and just the digits)?	• yes • no • depends	
How large is L1 cache on a standard-ish destop machine? (What about main memory?)	• Bytes • KB • MB • GB	
How many distinct users does Facebook currently have? (What about Twitter? Snapchat? Pinterest?)	• thousands • millions • billions • trillions	