Opening Discussion

- Uses of recursion:
  - Sudoku
  - Pyramid schemes
- IcP solutions.
Let's work on code from last time.
Some of the more efficient sorting algorithms are divide and conquer algorithms that are implemented with recursion.

- They divide on the way down, then may or may not do work on the way back up.
- Have $O(n \log n)$ average performance.
Merge Sort

- Break in half repeatedly on the way down. Recursively sort on each half.
- Merge sorted parts on the way back up.
- Can't happen in place because merge operation can't be done in one array.
Quicksort

- Can be done in place.
  - Pick a pivot.
  - Move all other elements either before or after the pivot as needed.
  - Recurse on the stuff before and after the pivot.
- Does all work on the way down, nothing on the way up.
- Inefficient List/Vector version is really short.
What topics would you most like to have video lectures for?

Imagine you live in a world of abundance where you can have anything that has been created without needing money, but people need to work to create new ideas/designs/technology/science/knowledge. What would you do with your time?