Broadcast Trees  (i.e., P2 hints)
Broadcasting
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Aside: Binomial Trees

Diagram from https://en.wikipedia.org/wiki/Binomial_heap
Binomial Trees
Binomial Trees
Broadcasting

How do we implement this?
Broadcasting
000 sends to 100, 010, 001
010 sends to 011
100 sends to 110, 101
110 sends to 111
001 receives from 000
010 receives from 000
011 receives from 010
100 receives from 000
101 receives from 100
110 receives from 100
111 receives from 110
Broadcasting

- **0000** sends to 1000, 0100, 0010, 0001
- **0010** sends to 0011
- **0100** sends to 0110, 0101
- **0110** sends to 0111
- **1000** sends to 1100, 1010, 1001
- **1010** sends to 1011
- **1100** sends to 1110, 1101
- **1110** sends to 1111

- **0001** receives from 0000
- **0010** receives from 0000
- **0011** receives from 0010
- **0100** receives from 0000
- **0101** receives from 0100
- **0110** receives from 0110
- **0111** receives from 0110
- **1000** receives from 0000
- **1001** receives from 1000
- **1010** receives from 1000
- **1011** receives from 1010
- **1100** receives from 1000
- **1101** receives from 1100
- **1110** receives from 1110
- **1111** receives from 1110
Tree-based broadcast activity

- Activity in /shared/cs470/mpi-tree
  - See comments in tree.c for instructions
- For P2, merge sort is reverse communication pattern
  - Sends become receives and vice versa
  - Get the communication pattern right first! (verify with debug output)