PARALLEL COMPUTING

Cilk

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Cilk Introduction

- parallel programming is hard
    - try to use existing programming structures for parallelization
    - including data parallelism in nested loops
    - and task parallelism in in recursive divide-and-conquer algorithms
- simple extension of C/C++
    - adds "spawn" and "sync" primitives
    - for automatic work-load balancing
- will see how this is implemented later
- in practice need "leaf coarsening"

Recursive Task Parallel Fibonacci


```
  int fib (int n) {
1   if (n < 2) return n;
2   int x = cilk_spawn fib (n − 1);
3   int y = cilk_spawn fib (n − 2);
4   cilk_sync;
5   int r = x + y;
6   return r;
  }
```