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;
   }
```