OpenMP

Recall: Using threads for parallelism

- Move code for thread into a function
- Create a struct to hold arguments
- Make threads and pass appropriate structs
- Cast arguments from void*
- Join threads
- Cast return values from void*

OpenMP

- API for shared-memory parallel programming

- Library + compiler support
  - Add hints to the code that tells compiler how to parallelize it
  - Avoids “grunt work” of using threads directly

Parallelizing Mandelbrot program using OpenMP

- Add pragma before loop you want to parallelize:

```
#pragma omp parallel for
for (int i = 0; i < numCols; i++) {
        for (int j = 0; j < numRows; j++) {
                ...
        }
}
```

- Compile with -fopenmp

Other OpenMP features

- create threads assigned different tasks
- mark critical sections
- barrier (threads wait at a certain point until all have reached it)