

Excercise Sheet 3

Solution

Lecture Parallel Processing

Winter Term 2025/26

Exercise 2: Pipelined parallelization of the Gauss/Seidel method using OpenMP (For Motivated Students)

Here is a sample parallelization of the solver's k-loop:

```
#pragma omp for ordered(2) schedule(static, 1)
for (k=0; k<kmax; k++) {
    for (i=1; i<n-1; i++) {
        #pragma omp ordered depend(sink: k, i-1) depend(sink: k-1, i+1)
        for (j=1; j<n-1; j++) {
            a[i][j] = 0.25 * (a[i][j-1] + a[i-1][j] +
                            a[i+1][j] + a[i][j+1]);
        }
        #pragma omp ordered depend(source)
    }
}
```