Programming Techniques 2024-2025

Course exercise 2
multithreaded dynamical simulation using Barnes-Hut and OpenMP

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Exercise: Multithreaded numerical integration of a system consisting of gravitationally interacting particles using the leapfrog integration method and Barnes-Hut algorigthm.

▶ See TAP p. 37-47 and p. 74-85

To do

1. Create makefile for the project.
2. Separate the main program into its own program source code file.
3. Separate the Barnes-Hut algorigthm into its own module.
4. Modify the code to use the types and routines in the geometry and particle modules.
5. Modify the program to write the simulation data into a file "output.dat", where each line contains the simulation state as "time p1x p1y p1z p2x p2y p2z ... pnx pny pnz".
6. Parallelise the code using OpenMP making sure that the code can be compiled with and without OpenMP support.
7. Store your code in your personal ex2 directory, make pull requests as often as you feel like.