



Universität Konstanz
FB Mathematik & Statistik
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Parallele Numerik

Blatt 3

Problem 4: Image Process



www.math.uni-konstanz.de/numerik/

Implement the parallel program *smandelbrot*. As starting point you can use the [serial version](#). It has to be compiled together with [pic.c](#), for example by typing

```
> gcc smandelbrot.c pic.c -o smandelbrot
```

The required definitions are contained in [pic.h](#) which has to be copied to the same place as [pic.c](#) and [smandelbrot.c](#). You can run the serial program *smandelbrot* with

```
> smandelbrot 1000 figureout.pnm
```

where the picture *figureout.pnm* is calculated. The first argument determines the size (number of pixels in horizontal direction). Note that 1000x1000 color pixels require about 3MB of memory! So do not take arguments too big to use up your disk space.

- (i) Test your parallel program with various picture sizes and number of processors.
- (ii) Determine the speedup of your parallel code compared to the serial version.
- (iii) In order to go to really large pictures sizes, remove the `pnm_write` command and do not allocate space for the final picture. For timing this is good enough - you automatically avoid any i/o delay.
- (iv) Implement a version of the program with static work distribution
- (v) Compare the performance with the case of dynamic load distribution.