Parallel Computing: Homework I

This will be your first homework in the exercise parallel computing. Send your solution to Matthias.huy@daimonas.de until November 16th 08.00pm. Prepare a pdf file for your written text and attach the source code of your program to the mail.

Task I (15 points)

Julia-Set

In this task you are going to finish the implementation of the Julia-Set.

You can calculate the Julia-Set with the following formula:

$$Z_{n+1} = Z_n^2 + C, \qquad Z, C \in \mathbb{C}$$

Z is element of {z |Re([-1, 1]) + Im([-1, 1])i} and *C* is a constant, with

C = -1.2 + 0.157i.

To draw the Julia-Set iterate 300 times over the formula above, for every pixel on a 1000x1000 grid and if $||Z_n^2|| < 1000$, mark the pixel, as it is part of the Julia-Set.

a) Download the framework from the website. As you can see, the formula is already implemented.

b) Add the calculation of the index *arrayIndex*. Each thread should calculate the value of a single cell.

c) Add the allocation of the memory. Note: Host memory is marked with a h_ and device memory (memory on the GPU) is marked with a d_.

d) Run the program on the cluster. Add a picture of your result to your solution. If you want to, you can also change the calculation formula to get different fractals. See http://en.wikipedia.org/wiki/Julia_set some ideas.