Serie 1 - Solution

Exercise 1 (Computational complexities)**.**

(a) What is the problem complexity ? ("big O" notation). Assume the number of steps is proportional to N.

Here some blabla

(b) compute the arithmetic complexity of the algorithm per step.

(c) compute the computational complexity ("big O" notation) of the algorithm (in **time**)

(d) compute the computational complexity ("big O" notation) of the algorithm (in **space**)

(e) is this problem worth to be parallelized ? Why ?

(f) what is the computation time for one iteration step on a deneb core ?

Exercise 2 (Theoretical analysis : Amdhal's law)**.**

(a) compute the message size that must be sent and received at each iteration step

(b) what is the communication time on an infiniband intercommunication network (such as deneb) per iteration step ? You can use Table **??**

(c) what is the communication time over computation time ratio ?

(d) give an estimation of f (the sequential part of the code that can not be parallelized).

(e) What is the upper bound of the speed up in the case of Amdahl's law ?

Exercise 3 (Theoretical analysis : Gustafsson's law)**.**

(a) What would be the maximum efficiency of this parallel 2D poisson solver at 128 processors ?