Exercise 2

Programming SS 2019 - Problem Set 4

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Exercise 2A:

- Measured runtime for 10’000 sample points : **0.00600764 sec**
- Measured runtime for 100’000 sample pointes : **0.052242 sec**

Note: Execution outputs are stored in *Exercise2/2a/output/*.

Exercise 2B-C:

- Measured runtime for n=10’000 and m=100’000 : **0.190815 sec**

Note: Exection output is stored in *Exercise2/2b-c/output/*

Exercise 2D:

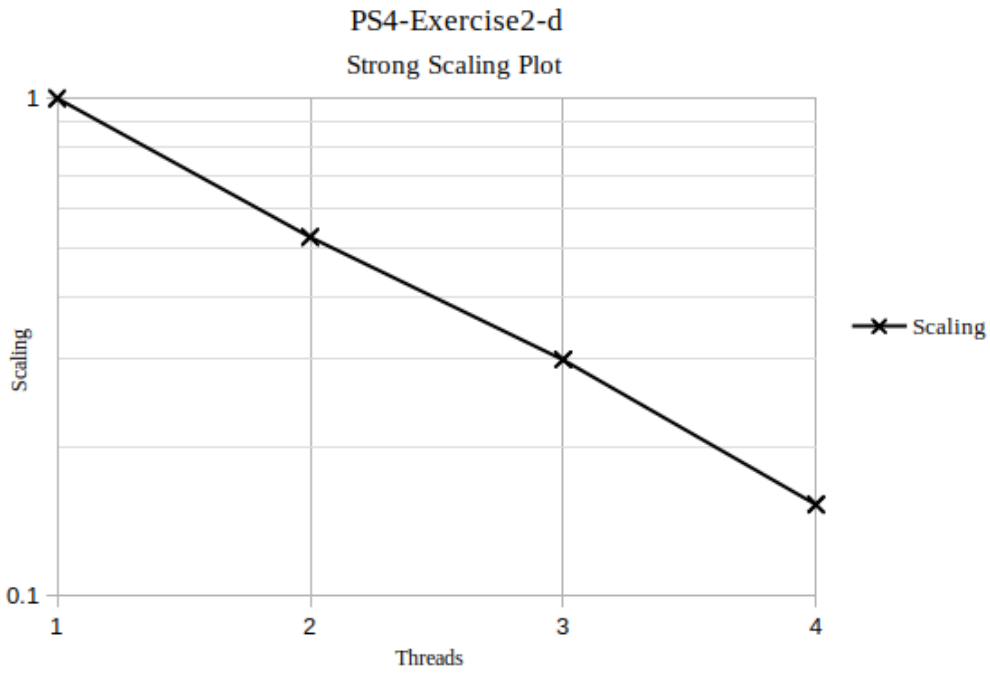
We are asked to generate a *strong-scalling* plot based on the timings recorded when executing the code with 1,2,4,8 CPUs (threads in our case).

Strong scaling (*T*) is calculated as follow:

$$T = \frac{t_1}{t_N * N}$$

Where:

- t_1 : time to complete work with one processing element.
- t_n : time to complete work with *n* processing elements
- *N* : amount of processing elements



Bonus Question:

Why should we generate the random numbers before the parallel region ?

- If we don’t, each thread will generate its normally-distributed random numbers, but in our case, we need each thread to use the same set of normally-distributed random numbers otherwise the final result will change with the amount of threads used.