LAPP
Laboratoire d'Annecy de Physique des Particules

Optimisation :
Saxpy

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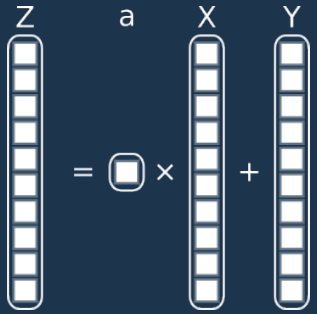
The Single precision A X plus Y (saxpy)

$$z_i = a \cdot x_i + y_i, \quad \forall i \in 1, N, a \in \mathbb{R}$$




```
void saxpy(float* tabResult, float scal, const float * tabX, const float* tabY, long unsigned int nbElement){
	for(long unsigned int i(0lu); i < nbElement; ++i){
		tabResult[i] = scal*tabX[i] + tabY[i];
	}
}
```

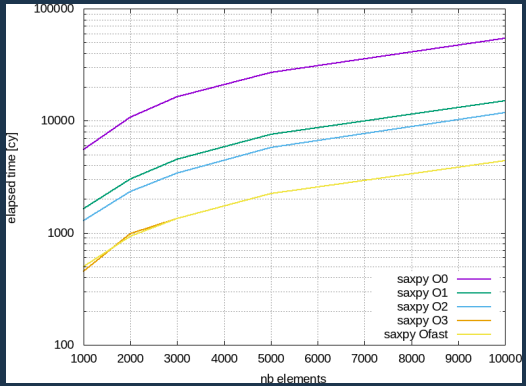
The Single precision A X plus Y (saxpy)

You already know how to make the performances test !

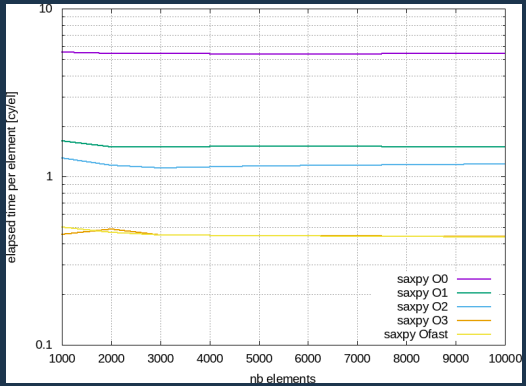
- Do not forget :
  - To include **asterics_hpc.h** in the **main.cpp**
  - To call **target_link_libraries(saxpy_O3 asterics_hpc)**

The Saxpy : base performances

Total Elapsed Time (cy)



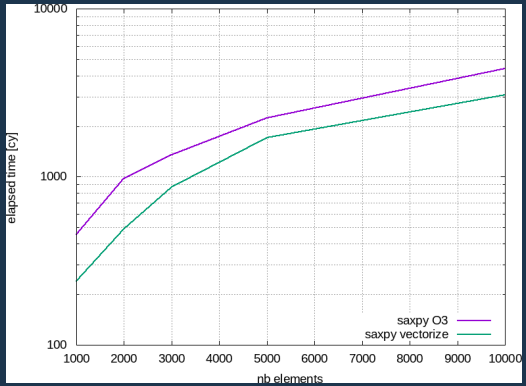
Elapsed Time per element (cy/el)



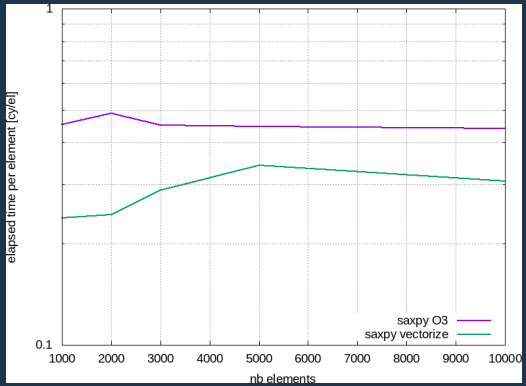
Speed up of **12** between **-O0** and **-O3** or **-Ofast**

The Saxpy : vectorized Performances

Total Elapsed Time (cy)

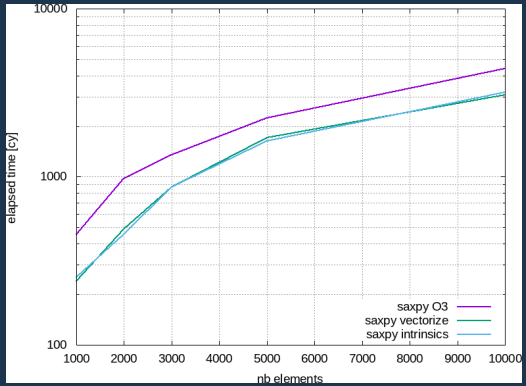


Elapsed Time per element (cy/el)

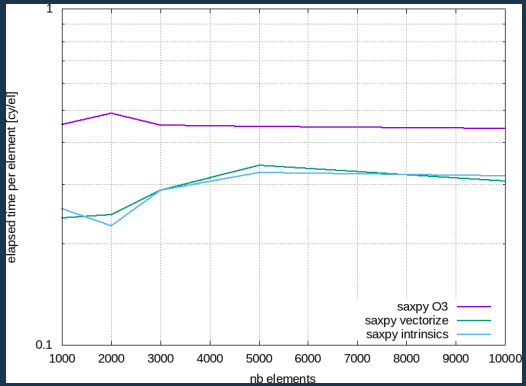


The Saxpy : intrinsics performances

Total Elapsed Time (cy)

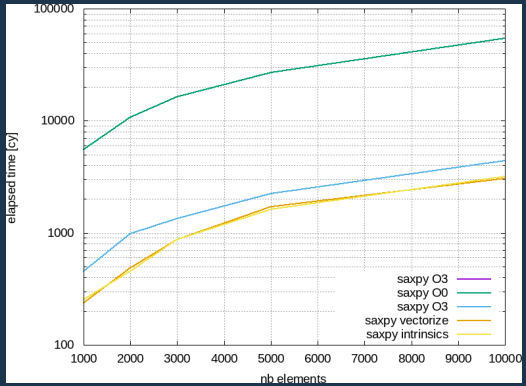


Elapsed Time per element (cy/el)

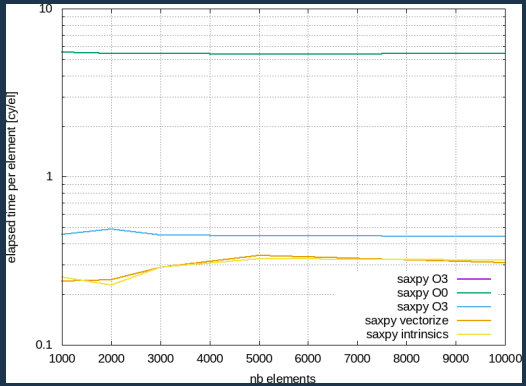


The Saxpy : summary

Total Elapsed Time (cy)

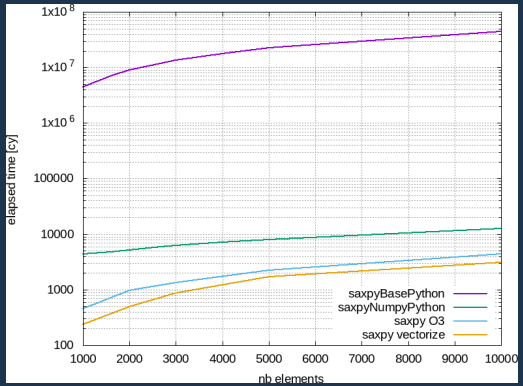


Elapsed Time per element (cy/el)

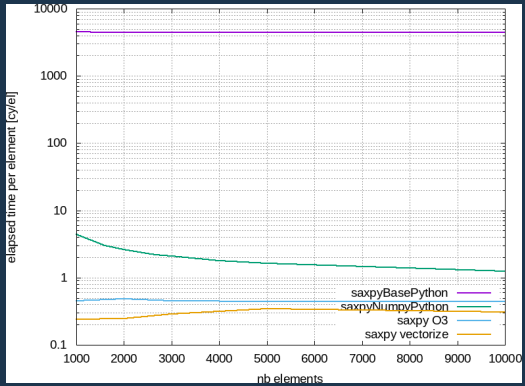


The Saxpy : Python

Total Elapsed Time (cy)

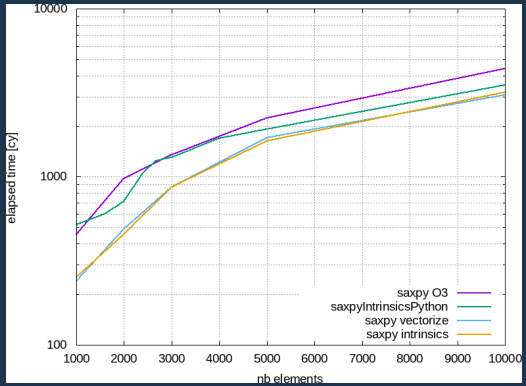
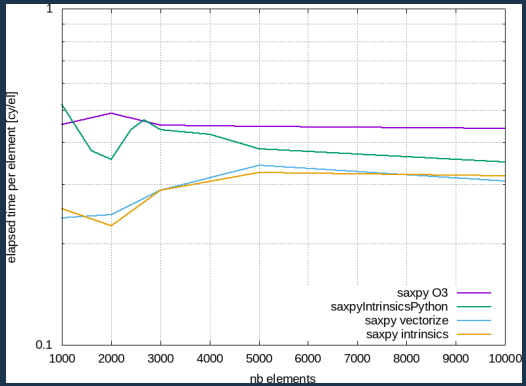


Elapsed Time per element (cy/el)



The Saxpy : Python summary

Total Elapsed Time (cy)



Elapsed Time per element (cy/el)