

# Create a library : Asterics HPC

Pierre Aubert



Minimal repository :

```
https://lappweb.in2p3.fr/~paubert/ASTERICS_HPC/ressource/build/  
Correction/ExampleMinimal.tar.gz
```

Correction :

```
https://lappweb.in2p3.fr/~paubert/ASTERICS_HPC/ressource/build/  
Correction/Examples.tar.gz
```

Minimal example



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Minimal example



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## Minimal example

AstericsHPC

asterics\_hpc  
macro cmake



ExampleMinimal

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asterics\_hpc



ExampleMinimal

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ExampleMinimal

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1-Hadamard



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**1-Hadamard**

**2-Saxpy**

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3-Reduction

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- ▶ To provide :
  - ▶ The **rdtsc** function (to time functions)
  - ▶ The aligned allocation/deallocation functions (needed for optimisation)
    - ▶ Table
    - ▶ Matrix
  - ▶ Some **CMake** macros to run and plot all the results automatically
    - ▶ **runExample(target)** and **runPythonExample(target dependency)** :  
To run executables with **make run\_all**
    - ▶ **plotPerf("plotName" target1 target2 ...)** :  
To plot and compare results from different targets with **make plot\_all**
  - ▶ The results are created in **build/Examples/Performances**
- ▶ C++ library : **asterics\_hpc**
- ▶ Python module : **astericshpc**

This will simplify all the following examples.

Ask the CPU the number of cycles since the program's beginning

64 bits version :

```
extern long unsigned int rdtsc(void) {  
    >>     long unsigned int a, d;  
    >>     __asm__ volatile ("rdtsc" : "=a" (a), "=d" (d));  
    >>     return (d<<32) | a;  
}
```