

Tecniche di programmazione in chimica computazionale

Optimisation

Emanuele Coccia

Dipartimento di Scienze Chimiche e Farmaceutiche

- Make the program **faster** and **more efficient**

- Make the program **faster** and **more efficient**
- **Compiler options** to optimize the program

- Make the program **faster** and **more efficient**
- **Compiler options** to optimize the program
- **User** changes of the source code

- Make the program **faster** and **more efficient**
- **Compiler options** to optimize the program
- **User** changes of the source code
- Check the performances (**profiling**)

Optimization options

- Use **optimization options** of the **compiler**: `-Ok` ($k=0,1,2,3$) (type `man ifort` and search “Specifies the code optimization for applications.”)
- **Automatic** optimization improving code performance
- Example with **profiling.f90**
- Compile with `-O0`, `-O1`, `-O2` and `-O3` ($n=100$ and $m=1000$ as input)
- Run the executable by typing `time ./profiling.x`

- Detailed analysis of the code performance

- Detailed analysis of the code performance
- Done using a **compiler option**:
 - 1 `ifort -pg -o code.x code.f90`

- Detailed analysis of the code performance
- Done using a **compiler option**:
 - 1 `ifort -pg -o code.x code.f90`
 - 2 `./code.x`

- Detailed analysis of the code performance
- Done using a **compiler option**:
 - 1 `ifort -pg -o code.x code.f90`
 - 2 `./code.x`
 - 3 `gprof code.x > profile`

- Detailed analysis of the code performance
- Done using a **compiler option**:
 - 1 `ifort -pg -o code.x code.f90`
 - 2 `./code.x`
 - 3 `gprof code.x > profile`
- Example **profiling.f90**