Computational Quantum Physics

Week 2

Exercise 1: **Latex Template**

Using Latex create a template to submit reports, including:

1. Heading with your name and the date
2. Footer with exercise number and course name and year
3. A title
4. An abstract
5. Different sections, such as (if applicable)
   * Theory: Explain briefly the theory you have based your solution on.
   * Code development: Introduce strategies, tests, and report debugging problems, compilations options.
   * Results: Present data and explain your results.
   * Self-evalutation: What have you learned? What can be done next? What went wrong and why?

(a) Prepare this – and following – weekly reports using such template.

(b) Upload the report in Moodle under the correspondent exercise.

(c) File names must include your name, exercise number and codewords report, and code. Example: Ex2-Rossi-REPORT.pdf

Exercise 2: **Derived Types**

In Fortran90 write a MODULE which contains a double complex matrix derived TYPE that includes the components: Matrix elements, Matrix Dimensions, Matrix Trace, and Matrix Determinant.

(a) Define the correspondent TYPE.

(b) Define a function that initializes this new TYPE

(c) Define the functions Trace and Adjoint

(d) Define the correspondent Interfaces of the previous points.

(e) Define a subroutine that writes on file the Matrix TYPE in a readable form.

(f) Include everything in a test program.