

## **Guide: “How to report and document computer work in written assignments?”**

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As a part of the course it is mandatory to complete assignments. The assignments count towards the final grade. These will therefore be used in the overall assessment of your work in the course. Thus, the goal of the assignments should be to clearly inform the reader about **the results of a scientific investigation**. This implies that to the extent possible it should be *based on sound theory (if possible), reproducible and verifiable*.

The reports do not need to be long or involved, they just need to contain sufficient details to fulfill the above-mentioned requirements.

The motivation for requiring reports is that computers are a great way to generate massive amounts of unorganized gibberish in rather short periods of time (in particular for a well-tuned high-performance code base). By requiring that results are organized in a report and synthesized, you as a student are forced to think about what you do and how to communicate your experiences to others. At the end, this should lead to a greater understanding of the material, (hopefully) catching of errors, identification of opportunities, etc.

It is recommended that assignments follow the following layout:

### **Short summary**

Describe the problem being solved, the methods, the results and main conclusions.

### **Statement of problem**

What problem is solved and perhaps in what steps the solution is decomposed into smaller steps (which will then be found in appropriate sections).

### **Description of hardware and software**

Describe clearly what hardware and software are used and identify what is important to the present study.

### **Description of theory**

What motivates the choices you make? What is used to verify correctness of the implemented code? Etc.

### **Description of algorithm**

Which algorithm are you trying to implement? How have you verified your implemented program is doing the right thing? Describe.

### **Results**

Present the important and relevant results of your computations and investigations. Use tables and graphs and fill these with data that are interesting. For example, you might want to analyze the timing results of your algorithms by

providing graphs of the rate of execution (operations/sec) as you vary the size of the problem. You might also want to analyze the rate you achieve compare do the theoretical peak performance rate of the processor to indicate how good the performance is. Make sure to discuss and interpret your results. How do they relate to your expectations? Can we do better? Etc. Comment on things that are obviously peculiar.

### **Conclusions (most important part)**

Discuss your main results and show that you understand the meaning of the results. If you expectations or predictions do not come true, try to explain why. Is it a mistake in the code? Or assumptions? Your mission should be to convince the reader that you know what the answers should be and that you indeed get them and why this is so. The goal is not to just produce correct solutions – the goal is to demonstrate that you understand what you are doing and that you have been systematic in producing correct results. The reason for this is that it is the computer, which does the work! We should not trust the computer, but the person responsible for using it. Thus, this section is very important.

### **Appendix**

Put relevant pieces of code inside the appendix. Pieces of relevant code can also be placed inside relevant sections of the report to make it easy to understand what work has been done and how.