

All About Programming Assignments

There will be several programming assignments. The first will involve the use of the system calls of MINIX to write some simple C programs. The remaining assignments require modifications to MINIX to improve its performance and functionality, or just to play with its code. This handout describes some general thoughts and techniques for doing the programs, as well as what is required, how to submit it, how late programs are handled, and other administrative matters.

Running MINIX 3

You can download MINIX from the web site <http://www.minix3.org>, or you can use the CD in the back of your book. I would recommend using a virtual machine; there are references to several of these on the MINIX 3 home page. There is also a pre-loaded version of MINIX 3 on VMWare at <http://www.minix3.org/vmware.html>, and a free VMWare player for PCs there. Finally, there are virtual machines in the CSIF, and you can load MINIX onto one of them. Ask the CSIF staff for the machines that run them.

Programming Partners

You may do these assignments individually, but we prefer you to work in teams of two to three. You will find this helpful, too. If you work in a group, then you should expect to stay with that group for the duration of the quarter, unless the other member or members drop the class or go on strike.

Turning In Programming Assignments

Programming assignments will be due by 11:55PM on the due date, unless noted otherwise on the assignment. You must demonstrate the solution to the grader (who will be one of the teachings assistant).

Turn in programming assignments by creating a *tar(1)* file containing all the source code files you have changed.

You also must sign up for a time slot to demonstrate your solution(s) to the grader. Sign-up sheets for time slots will be posted 2–3 days before each assignment is due. We encourage you to finish your assignments early. The TA will have significant office hours, and if you demonstrate your solutions before the due date (all problems must be complete to demonstrate early), then you will have the opportunity to fix any bugs found during the demonstration.

If you did the assignment as a group, then all members of the group must be present for the demonstration. Be sure that all members of the group are familiar with all code written and changed, because the grade for each assignment depends in part on the answers given to questions the grader asks about the code and the reasons for your approach. It is probable that you will fail a programming assignment if you don't understand the solution, even though other members of your group pass.

When you come, bring the system running MINIX that you worked on if you can. If you cannot, the grader will download the files from SmartSite, install them on MINIX 3 running at the CSIF, and test them there. If you know you cannot bring the machine, please test your assignment on the CSIF system *before* turning it in. You will be graded on what the grader sees, not on how it worked on a system the grader does not have access to.

Important: Please remember that the TA cannot be present in the CSIF for all hours in which the CSIF is open. As the due date for a program approaches, the TA is likely to be very busy; you will find us much more sympathetic if you approach us with questions well before a program is due.

Asking For Help

Everything in **All About Homework Assignments** applies here. Please try to debug problems yourself before seeking help; you will learn more that way.

Don't Delay!

We must emphasize the importance of taking time to design your program, and to understand the code and the modifications you must make, thoroughly. More programming problems arise from improper design than anything else, and the few hours you spend on design will be amply repaid by shorter coding and debugging phases. So do think the design and interfaces through, and—as always—try to find the simplest way to do the assignment (within the limits given in the assignment, of course)!

Do not leave assignments for the last minute. The assignments are non-trivial and will require significant design time before you start programming and debugging. When we decide on the due dates, we assume you will spend significant amounts of time on design as well as coding and debugging. If you choose not to do this, you will have difficulty finishing the assignments on time.

Some Notes

Please don't skip programming assignments. This will certainly bias the professor (me) against you.¹ It also will hurt your grade substantially (check the weightings of the grades above to verify this). It will also hurt your understanding of how real operating systems work. You have the opportunity to work with a little, but fully functioning, operating system. Many computer scientists learned operating systems by reading the code to UNIX Version 6, which was substantially smaller than current versions of UNIX. MINIX gives you essentially the same opportunity. This experience will be invaluable to you. It will also impress interviewers when you go for interviews, and will help you immeasurably if you ever have to work on a larger operating system (like Linux or FreeBSD!)

Late Programs

We will accept late programming assignments up to one day after the due date and time, and will deduct 20% of the value of the assignment (so if the program assignment is worth 100 points, you lose 20 points regardless of your score; if it is worth 200 points, you lose 40 points). Requests for exceptions will be handled on a case-by-case basis (in other words, ask).

Grade Appeals

If you feel that there is an error in grading, please come see me or the TA and we'll look over it (and possibly talk with you about it). However, don't dally; any such request must be made within one week of grading. After that, we won't change your grade.

¹I would make penalties more dire, but I couldn't enforce any of the ones that come to mind, such as requiring you to use no system other than MS/DOS and no language other than machine language for the rest of your academic career in computer science.