

Program Grading

Your CS106 programs will be graded on two major areas: functionality and design/style. Although you will often concentrate your efforts on getting the program "to work" (whatever that takes!) you'll learn that our expectations go beyond just working— we also want an elegant, well-engineered solution. A program can truly be a work of art and something you can be proud of when showing off both the executable and the code.

Functionality Functionality denotes whether or not the program performed as expected i.e. did it meet all the requirements set out in the assignment handout. For this evaluation, we examine your program's behavior from an external perspective, without looking at the code. We will test your program on many different inputs to determine its correctness in a variety of situations.

Design/style Design and style capture whether the program has a clean and elegant organization that is easy to read and understand. Does it employ principles of good decomposition and re-use/unify rather than repeat code? Does it make well-reasoned choices for data structures? Would it be easy to maintain and/or extend? Are the variables and procedures meaningfully named? Does it have descriptive and accurate comments? Are the layout choices readable and consistent (use of white space, capitalization, punctuation, etc.)? For this evaluation, we carefully read the code and offer constructive input on your choices.

Each category is assigned a grade using a bucket scale (the two different scales used are described below). Rather than resorting to nit-picking and summing up points, we want to provide a clear overall sense of your program's strengths and weaknesses in these areas, and we believe a fairly coarse bucket scale is best for this. The total assignment score is the sum of the scores, the two parts are equally weighted. It is possible for a perfectly functional program to earn a low score in style and vice versa. We encourage you to make your program shine in both areas!

Interactive grading

Programs will be graded in a one-on-one conference with your section leader. Past 106 students seem in strong agreement that this interactive grading is one of the course's best features. Your section leader will discuss with you the specifics of where your program excels and where you can improve for next time. Their feedback and nourishment can help guide you in your passage from programming novice to accomplished software engineer. The grading conference is a marvelous and rare opportunity for intense, personal feedback. I hope you'll find it a lot more useful and inspiring than getting a returned paper marked with a numeric tally.

Functionality scale

Below is an explanation of the scale we will be using to express the level of functionality in a given program. Pay special attention to the **message**— each bucket is designed to send a clear indication of where you stand relative to our standards that should help you decide how to proceed from here.

- + An exceptional program —one that works correctly in all situations and exceeds our expectations, going above and beyond the assignment requirements. Super work! We cannot find fault and would love to show such a program to the entire class as an extraordinary example. Only about 5% of the programs receive this grade and it is never given out unless a ✓+ was also received for style. The message: "Fantastic work, congratulations!"
- ✓+ An excellent program —one that meets all of the requirements gracefully and has only minor flaws. Your section leader may be able to provide suggestions for some small adjustments or quibble with a few things, but these programs are overall very well-done and distinguish themselves in all areas. Perhaps a third of the programs will receive this grade. The message: "Great job, keep it up!"
- ✓ A good, solid program —one that is complete and generally meets the requirements of the assignment, although perhaps some parts could have been handled better. Your section leader can provide feedback on what can be improved upon for next time. This is the median grade and we expect around half of the programs will be given this grade. The message: "Good work."
- ✓- A program with room for improvement. The program doesn't quite meet all of the requirements of the assignment, perhaps because it is a bit incomplete or has errors with one or more required components. With a bit more work it could be a good program. Your section leader can help you to understand where to go from here. The message: "Hang in there, try to learn what you need to move forward."
- A troubled program. The program exhibits serious problems and/or is an incomplete attempt, but it does show some understanding and effort. This grade indicates that improvement needs to be made immediately. The message: "Time to get serious about getting back on track."
- A very incomplete program. This score usually indicates the program had very little effort put into it and/or has serious errors. A large amount of work needs to be done before this program would work correctly. The message: "Talk to instructor before it's too late!"
- 0 No program turned in at all.

On some assignments there will be an opportunity for extensions beyond the standard assignment requirements. Doing this extra credit will potentially earn you between one and four Gold Stars of Valour. These will be figured into your final grade, but not your assignment grade. Also, note that while they do count, extra credit will not make up for a problematic assignment. Thus make sure you have thoroughly tested your assignment core before moving on to any extensions! Ultimately the main part of the assignment is the real meat and extensions are just gravy.

Design/style scale

There are fewer buckets in the design/style scale and we hope for the scores to be a bit higher than functionality. Below are the buckets used for this evaluation:

- √+ A well-engineered, sensible, and readable program. Bravo! The overall approach is straight-forward, data structure is cleanly organized, tasks are nicely decomposed, algorithms are clear and easy to follow, comments are helpful, layout is consistent— an overall polished production. All students are capable of achieving this result and we encourage you to set your goal high. We expect it will take some feedback and iteration before your work is this graceful, but by the end of the quarter we would love to give out half or more grades in this bucket.
- √ A program that exhibits reasonably good design and style. The program clearly makes a sincere effort toward an elegant solution, but it may not be entirely consistent, have a few minor problems or perhaps a more major issue that needs attention. Your section leader will be able to offer constructive ideas on how to tidy up and refine your work.
- √- A problematic program. The program has more significant flaws in terms of design and style, either due to carelessness or lack of coaching on these important aspects of programming. We encourage you to work closely with your section leader to develop better awareness of these issues and are happy to offer lots of concrete suggestions for improvement. Certain programs, such as those that are very incomplete, will automatically be placed in this bucket.
- 0 No program turned in at all.