

CS 12: Assignment 6

Handed out: February 26, 1996

Due: See below

Introduction

This is a group project. YOU will be working in groups of three. The project involves not only writing a class, but also writing detailed documentation and performing extensive testing of the class.

Smart Arrays

The built in array type in C++ is not a very powerful tool. The type of element and size of the array are set at declaration (or at allocation). Most operations can be performed only on array elements, not entire arrays. There is no range checking, leading to hard-to-detect bugs.

Write an array type `Array` that will implement smart and safe arrays with the following features:

- The size of the array can be dynamically changed during the run of the program.
- The range of indices can be determined by the programmer (don't have to start at zero).
- Range checking: any attempt to access elements outside the range will result in an error message.
- One array can be copied onto another using the assignment operator (`=`).
- The entire array can be output with one `cout` statement.
- Array items should be accessed naturally using `[]`.

Details

As you can see, I am not providing you with a list of methods, operators, and their parameters. Your first task is to determine what those should be. Turn in a list of methods with a precise description of how to use them. This should **NOT** be a description of how the methods are implemented – that will be part of the documentation in the implementation file. What you need to turn in is documentation for a client that will use the class – what you expect to read if you are the client that will be using it. Specify precisely how to use each method, and what parameters are required. If you have more than one constructor, explain how each should be used.

Your second task is to implement what you have written. Write an `array.h` and an `array.cc` that match the specification you turned in for part I. You should, of course, test your class to make sure it works as advertised.

Third and last is testing. You will receive the documentation and `array.h` file that another group has written, as well as the `array.o` file, but you will not see their implementation code. Your job is to test all the features of the class and submit a report as to if and how they work.

Turnin

The turnin directory for this assignment is `array`. Select one group member and submit from their directory.

Due dates:

1. Part I – documentation: Due Monday, March 4th, in class.
2. Part II – implementation: Due Monday, March 13th, in class.
3. Part III – testing: Due Monday, March 20th.