CS 131: Programming Languages, Spring 2003

Assignment 6
C# Language Report

Due: Wednesday, April 2

Goals for this Assignment

1. Applying ideas from CS 131 to new languages.

Office Hours

The purpose of office hours is to provide you with a chance to discuss class-related topics, to ask questions about material you find particularly interesting or particularly confusing, and to provide comments about the class.

You can drop by Olin 1253 any time to see if the professor is around; times specifically set aside are Tuesday, Thursday, and Friday from 2:30–4pm. Grutors are available in the Terminal Room on Tuesdays 7–9pm and Sundays 2–4pm. Questions can also be sent to `cs131help@cs.hmc.edu` .

Instructions

- For this assignment you are encouraged to (but are not required to) work together with another student. If you would like a partner assigned, send e-mail directly to `stone@cs`. (Students will be paired off as requests are received; if there is an odd number, the last request will go unfilled.)

- You should `cs131submit` your answer as a PDF file `csharp.pdf` (or, if absolutely necessary, a PostScript file `csharp.ps`.) If you work with another student, only a single submission is necessary.

Statement

You are consulting for a small software company that is considering switching to using the C# programming language. Their programmers are currently spending all of their time getting a release out the door, and thus don't have much time to think about new programming languages. You have been hired to look into C#; the hope is that by reading your report their programmers can learn this new language more quickly.

Since your contract runs for only a week, the company has requested that you concentrate on the following specific issues:

- C#, like Java, has a type system that is supposed to ensure safety. What sorts of types does C# provide and how are these types related by subtyping, including implicit conversions? (You need not list every single type in the language; related types can be treated as a group.)
- What sort of parameter passing does C# support?
- What are the rules for overloading? That is, when can two methods with the same name coexist in the same class, and, given specific arguments, how does the system choose which of the available methods is the right one (or that none are right)?
- C# includes features called *properties*, *delegates* and *events*. What are they, what are they good for, and how do they compare to constructs in other languages?

Fortunately, their programmers have all taken a college course in programming languages, and so you are free (and encouraged) to use all the ideas and vocabulary that have been discussed in CS 131.

Requirements

Your report should:

- address all the requested issues
- have clear, accurate, and complete answers
- use appropriate vocabulary
- provide example code and/or comparisons with other languages, if this would improve clarity.
- be relatively self-contained (e.g., the report should not assume the reader saw the problem statement or has previous knowledge of C#)
- provide a bibliography of resources consulted
- have no spelling or grammatical errors
- be legible (e.g., adequate margins, no tiny fonts)
- violate no copyrights (i.e., the report does not contain paragraphs or example code copied from other sources, for then the software company can't redistribute your report).

Resources

You may use any reliable general resources on C#, as long as they are documented in your bibliography. For example, there are a couple (not necessarily very good) C# books available in the Terminal Room (which must *stay* in the terminal room), Sprague Library may have other books, and there is plenty of very detailed information available on-line (e.g., from Microsoft directly at `http://msdn.microsoft.com/`).