

Quiz #1 Answers

1. Chapter 2 introduced one usage of the const keyword. What was that usage? (I'm not asking for you to specifically quote a line from the book, I want you to instead describe where it appeared in their sample program and what role it served there.)

In the sample program in chapter 2, const was used in the declaration of a number of variables and are described on pages 38 and 39. When const is used in those declarations it tells the compiler that the value of that variable is not supposed to change. So in the example

```
const int penniesPerDollar=100;
```

the const implies that the number of pennies in a dollar can't change in the execution of the program. This is to prevent someone from accidentally changing it. If you were to put in the line

```
penniesPerDollar=50;
```

Later in the program the compiler would tell you there was an error.

2. In class I put the slide discussing "Error Handling" just after the slide on the Testing phase of the software lifecycle. In reality though the error handling spans Design, Implementation, and Testing with most of the emphasis in the Design phase. Given what you know about error handling, how does it come into the Design phase?

The idea behind error handling is that you want your code to be able to deal with errors that might come up in the normal execution of the code. A simple example of this is when you are doing division. If you have the line

```
z=x/y;
```

you should check to make sure that the value of y is not zero before you perform this operation because if it is zero this line will cause the program to crash. This is the type of thing that you should think of in the design phase. While you are laying out how things will work together in the program you should try to identify where errors could occur and plan to put in code to handle those errors.

Extra Credit: Why do you think the const keyword exists in the C++ language? What purpose can it serve in facilitating the construction of programs that work well?

The const keyword is part of C++ because it allows the programmer to give extra information to the compiler about the nature of different entities in the program. The usage in chapter 2 is the most straightforward way that const can occur in C++ but as was described in my answer to #1, it allows the compiler to tell the programmer there is an error if the programmer tries to do something that he/she shouldn't. As it turns out, being able to specify different entities in a program as constant can be a remarkably powerful method of preventing bugs. The const keyword can also be used to tell that members (or behaviors) of an class (of object) don't change the object or to parameters passed to a function so it is clear the function does not modify those parameters. That might mean nothing to you now, but hopefully by the end of the semester it will mean something.