

Chapter 3 Notes

Data Type

Constants

Declaring Variables

- In QB, you could create variables whenever you needed them.
- In C++, variables must be declared ahead of time
 - Declaring variables sets aside RAM storage for variables
- Declare variables at the start of the function

How to Declare a variable

- **Datatype varname;**
- Datatype is the *sort* of data the variable is expected to hold, such as:
 - FLOAT (decimal numbers)
 - INT (whole numbers)
 - CHAR (characters = one letter, symbol, digit)
 - BOOL (true/false)
- Varname is the name of the variable
 - Similar names rules to qbasic apply

Initializing Variable

- In QBASIC, when you used a variable, you assumed the value started at 0. In C++, the value is unpredictable.
- You should always initialize variables:
 - `INT x = 0;`
 - `Float rate = 0;`

Declaring and Initializing Together

- You can declare variables of the same type together:
 - `SHORT x, y, z;`
 - `FLOAT j, k, l;`
- You can initialize variable (regardless of type) to the same value together:
 - `x = y = z = j = k = l = 0;`
 - Assigns all variables the value zero.

More on Datatypes

- Data types are very important to C++, but not used much in QBASIC.
- In QB, there were two data types:
 - Numbers
 - Strings
- In QB, depending on the data type, you could do different things
 - Ex: You can divide numbers, but not strings
 - Ex: You can use MID\$ with strings, but not numbers

Data Types in C++

- Text
 - For text in QB, we used strings
 - For text in C++, there are:
 - Strings, but they're a little trickier
 - Char – Character...can hold one piece of text
- Numbers
 - In QB, all numbers are the same
 - In C++, there are several types of numbers
 - Integer types – can hold whole numbers, but not decimals. They include:
 - INT, SHORT, LONG & Unsigned INT, Unsigned SHORT, Unsigned LONG
 - Floating types – can hold decimals. They include:
 - Float, double, long double

Which data type to use?

- With numbers, you *can* use float for most things, but it doesn't mean you *should*
 - *Example: In quiz1_1, you entered the Number of Tickets someone wanted to purchase. Most of you used float.*
 - *Floats – Occupy more storage space (which makes programs slower)*
 - *Floats – All for decimal numbers*
 - *Which, when talking about tickets, makes no sense... (I'll have 3.1 tickets please?)*
- Number of tickets should be an integer type variable. Further, it should be unsigned.
 - Unsigned integer types cannot hold negative numbers
 - *Which is good, since you can't buy -14 tickets*

Constants

- Constants should be used for numbers that don't change during the program.
- Ex:
 - `Const float tax = 0.06`