

More C (cont.)

School of Information Technology and Electrical Engineering
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Outline

- C Programming Language
 - Variable scope
 - Storage classes (**auto**, **static**, **extern**)
- Debugging (gdb)

Storage classes

- C variable declarations have an *extent* or **storage class**
 - **auto**
 - Variable has *local* (automatic) extent, i.e. removed at end of block
 - Permitted within a block only (i.e. not top level)
 - This is the default so rarely seen
 - **extern** (for variables or functions)
 - Variable/function is external to all functions, i.e. can be accessed by name by any function
 - Globally accessible – linker must know about the name
 - Must be defined once somewhere (can be declared anywhere)
 - **register**
 - Hint to compiler to put variable in a register, otherwise like auto
 - **static** (for variables or functions)
 - Name is only accessible in this file (i.e. not exported to linker)
 - For variables – extent is *static* – variable lasts for life of program
- Examples to be presented in class

This Week

- Lectures
 - More C
 - Debugging
- Pracs
 - Assignment One
 - More C programming exercises
 - System calls and libraries

Variable Scope

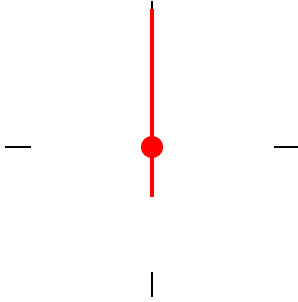
- **Scope** is the region of a program over which the declaration is visible
- Common scopes are
 - **file scope**
 - visible from declaration point to end of file
 - **function scope**
 - visible from declaration point to end of function
 - includes arguments to function
 - **block scope**
 - visible from declaration point to end of block
- Variable declarations can be hidden
- Example to be given in class

Type qualifiers

- **const**
 - Indicates that the value can't change, e.g.
 - `int atoi(const char* str);`
 - characters pointed to by str can't be changed
 - `const int constant_value = 37;`
 - `int * const const_pointer;`
 - `const int * pointer_to_const;`
- **volatile**
 - Indicates that the value can change in ways not under control of the program
 - Often used for interacting with hardware, special memory addresses etc

Short Break

- Stand up and stretch



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Things To Do This Week

- Assignment One
 - Grace days apply

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Debugging

- To be demonstrated in class

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