Embedded Programming: C resumes

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1 Language Basics

1.1 Characteristics of C

- Officially published in 1978
- Source code portability
- operates "close to the machine"
- Efficiency
- Compiler very compact
- C Library provides functions not in the core
- Library (mostly) written in portable C

1.2 The Structure of C Programs

- Statements, Blocks, Functions
- Starts with main()
- Prior declaration needed for compiler
- Definition of a function also declaration
- No nested functions

1.3 Source Files

- Internal structure:
  - Preprocessor Directives
  - Global Declarations
  - Function definitions
- Suffix for source files: .c

- Header files can contain commonly used Preprocessor Directives, suffix: .h
- Header files can be included in source files with #include
- Can i turn include other files
- White space is unimportant, except in Preprocessor Directives

1.4 Comments

- /* Block comments */
- // endline comments
- Comments does not work inside String Literals: "I am /* not a comment*/"
- Commenting out parts of a program often used.

1.5 Character Sets

- Two sets according to environment:
  - Translation environment (compilation): source character set
  - Execution Environment (running program): execution character set

1.6 Identifiers

- Names of variables, functions, macros, structures etc defined in a C program.
- 37 reserved keywords in C
- Format:
  - a-z, A-Z
  - _
  - 0-9, but not as the first character
  - Universal Characters from other languages
- __func__ will evaluate to the name of the current function

1.7 Identifier Scope

- File Scope: Inside the translation unit
- Block Scope: Often the same as function scope, but sometimes smaller
- Function Prototype Scope: parameter names in function prototypes
- Function Scope: Inside a function

1.8 How the C Compiler Works

- Compiler compiles source into:
  - Translation units
  - Object files
  - And then into the Executable file