

The C Programming Language in Action

Introduction

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SECOND EDITION

THE

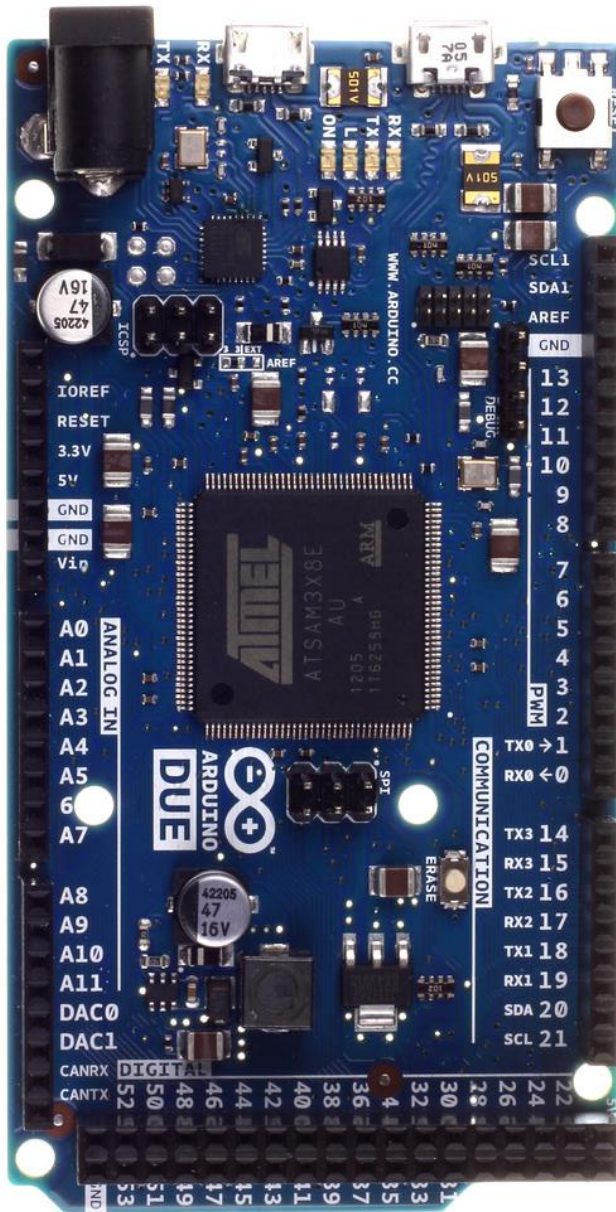


PROGRAMMING
LANGUAGE

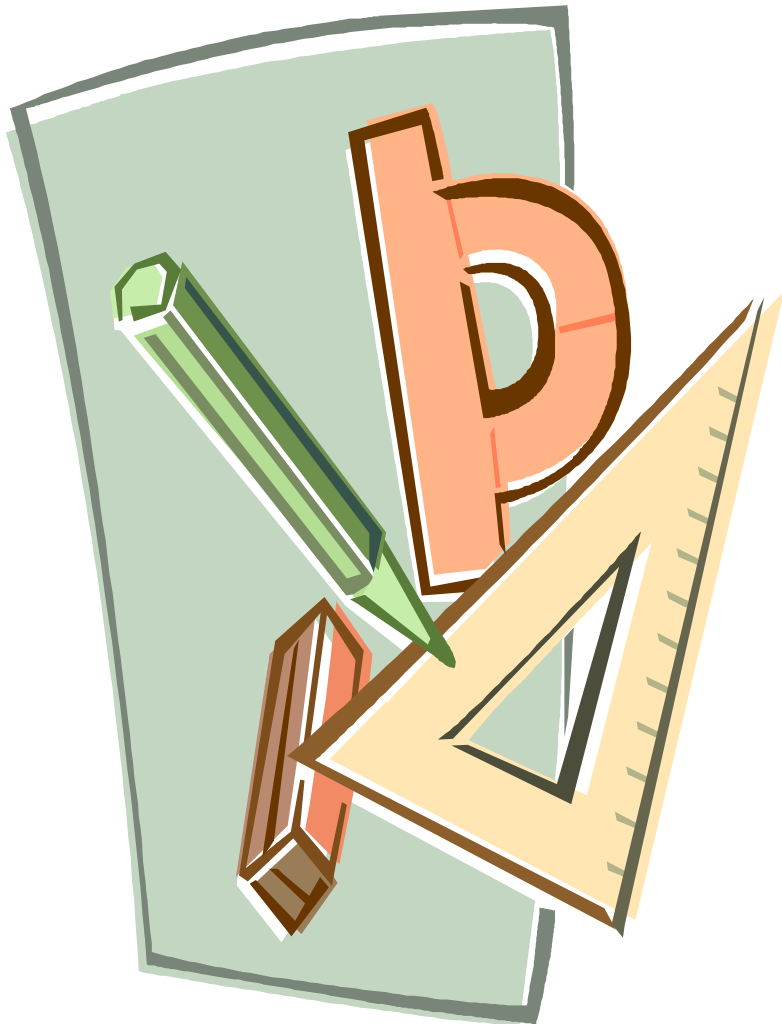
BRIAN W. KERNIGHAN
DENNIS M. RITCHIE

PRENTICE HALL SOFTWARE SERIES

- ANSI C / C89
- C99 & C11
- Standard Library
- Predictable C++



- Systems programming language
- Reliability
- Real-time response
- Predictability
- Concurrency



- **Microsoft Visual Studio**
- **GCC, the GNU Compiler Collection**

Getting Started with Visual C++

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Summary

- Visual C++ available in free edition
- Part of Visual Studio
- Always use warning level 4
- `cl sample.c /nologo /FeSoup.exe /W4 /TP`

Getting Started with GCC: The GNU Compiler Collection

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Summary

- GCC, the GNU Compiler Collection
- Choices, choices, choices
- <http://nuwen.net>
- Stephan T. Lavavej
- MinGW
- `gcc sample.c -Wall -std=c99 -Wextra -pedantic -o Sample`

A Tour of the C Programming Language

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Summary

- **Variables**

- Type
- Name
- Value

- **Loops**

- Condition
- Code

- **Functions**

- Return type
- Name
- Parameters & arguments
- Code

From Source Files to Programs

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Summary

- Source files (*.c, *.cpp)
- Header files (*.h)
- Declarations and definitions
- Preprocessing
- `#include <library.h>`
- `#define SCARY_MACROS`
- `#if constant-expression`
- `#if defined (DEFINITION)`
- `cl /nologo /c *.c`
- `link *.obj /out:app.exe`

Types and Declarations

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Summary

- Variables declared before use
- `type Name = initializer;`
- `int Chickens = 10;`

Structures, Unions, and Enumerations

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Summary

- Struct names and typedefs
- Layout and padding
- Unions
- Enumerations

Statements

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Summary

- `if (condition) statement`
- `if (condition) { ... } else { ... }`
- `switch (condition) { case 1 : statement break; }`
- `while (condition) statement`
- `do statement while (condition);`
- `for (init ; condition ; expression) statement`

Expressions

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Summary

- Computation
- Operations and statements
- Operators, operators, operators
- Conversion

Pointers and Arrays

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Summary

- Memory, Addresses, and Pointers!
- Arrays
- Pointers ❤️ Arrays
- Functions and Arrays
- String Literals
- Pointers ➡ Pointers

Memory Management

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Summary

- malloc & free
- malloc → HeapAlloc
- free → HeapFree
- new → malloc → HeapAlloc

Input and Output

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Summary

- `printf, sprintf_s, fprintf_s`
- `scanf_s`
- `stdout & fopen_s`

Working with Strings

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Summary

- `\r` `\n` `\t` `\\` `\"`
- Character classes
- `atoi`, `atof`, `strtol`
- `strlen`, `strcmp`
- `sprintf_s`

From C to C++

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Summary

- Member functions
- Construction and destruction
- Classes, structs, and accessibility
- Const
- References
- Function overloading
- Inline functions
- Templates

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