7. Pointers and Arrays

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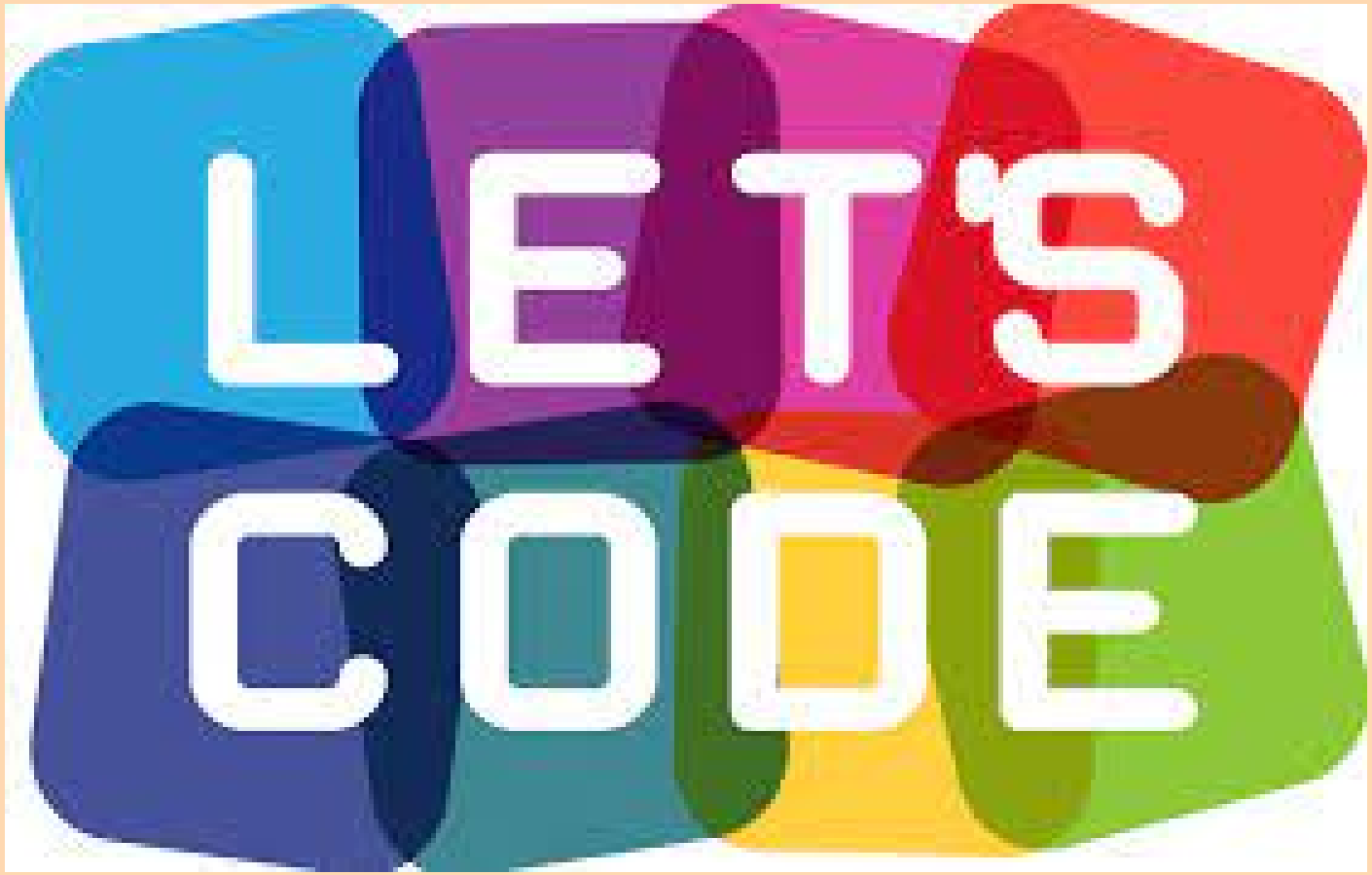
Overview

Pointers and Arrays (7 sentences = 4 + 3)

Dynamic Memory Management



pointer.c **selection-sort.c** **pointer-array.c**
pointer-const.c

Pointers provide an abstraction to memory.

Memory Address

Object

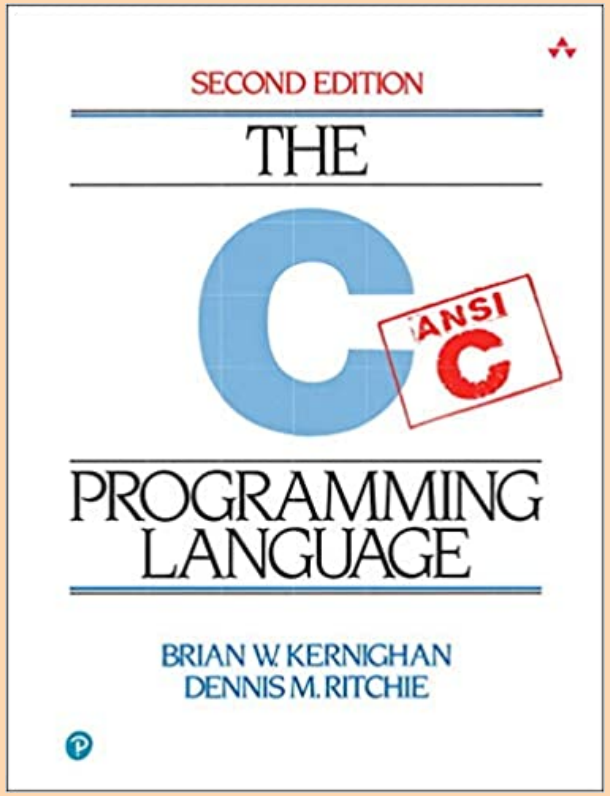
Variable (*identifier*)

Variables (pointer.c)

A variable has its *type*, *value*, and *address*.

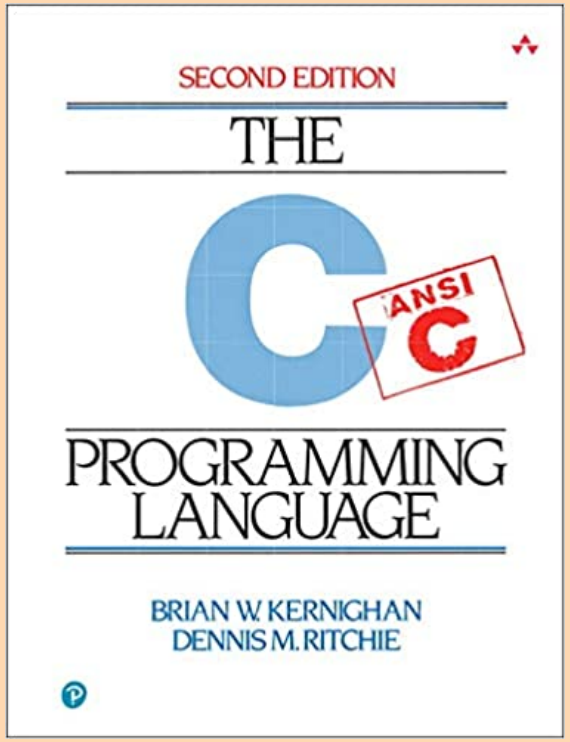
A variable can be used as a *lvalue* or a *rvalue*.

"A ***pointer*** is a ***variable*** that contains the ***address*** of a variable."

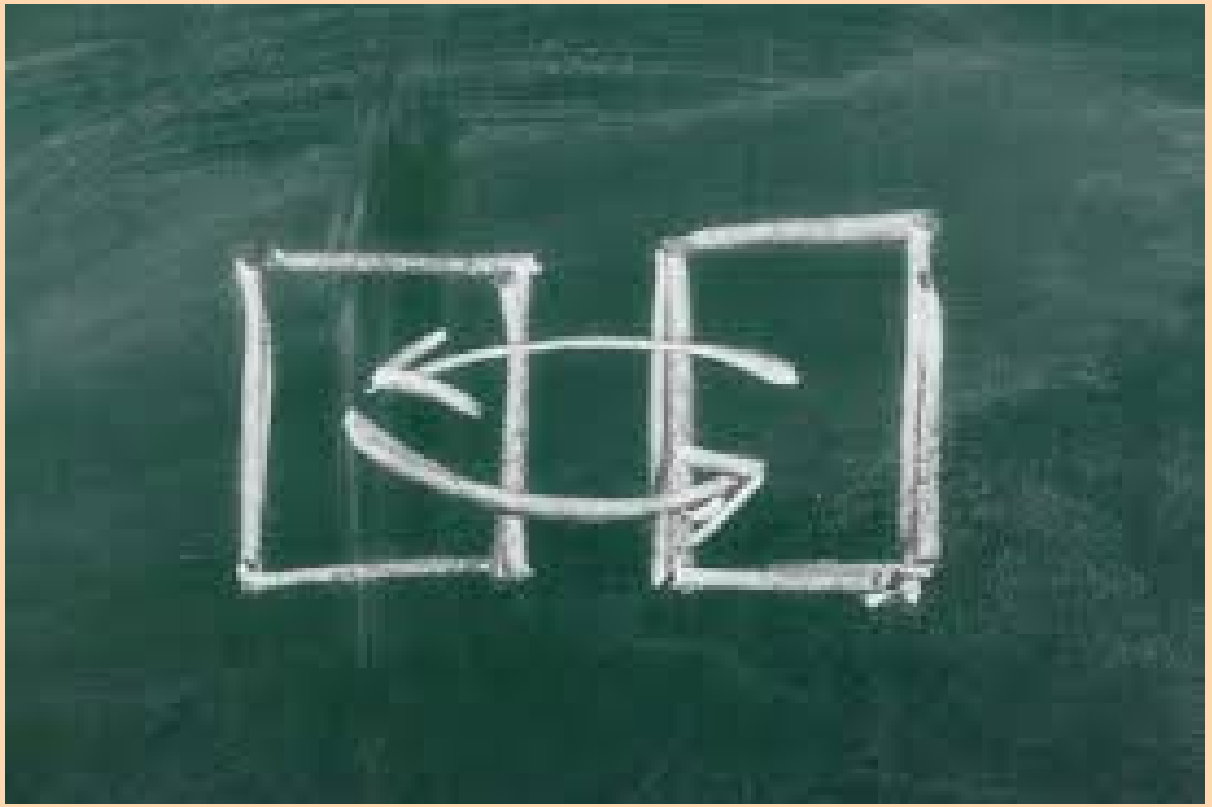


```
int *ptr = &var;
```

"**ptr* can occur in any context where *var* could"



Swap (selection-sort.c)



Pointers and Arrays (selection-sort.c)

In ***expressions***, the ***name*** of an array is a synonym for the ***address of its first element***.

Pointers and Arrays (selection-sort.c)

arr[i] is an ***lvalue***.

Pointers and Arrays (selection-sort.c)

But an ***array name*** is **NOT** a ***variable***.

(***unmodifiable lvalue***)

Dynamic Memory Management (selection-sort.c)

void *malloc(size_t size);

void free(void *ptr);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