

n3714 - Busting Another Ghost: UB#11: Value of auto Object

by David Svoboda

Undefined Behavior #11 in Annex J.2 of C23 (n3220) has this text:

11. The value of an object with automatic storage duration is used while the object has an indeterminate representation (6.2.4, 6.7.11, 6.8).

In the latest C2y draft standard (n3550), it is now UB#8, but has the same text.

We believe this UB no longer exists in C2y, and that UB#8 can be removed from Annex J.2 with no ill effects.

Rationale

(All the following ISO C references apply to n3550, rather than C23.)

What sections 6.2.4, 6.7.11 and 6.8 *do* explain is that an object with automatic storage duration that is not initialized starts with an indeterminate representation. Reading an object with indeterminate representation can be undefined behavior, but only if it is a non-value representation. But this is described in 6.2.6, and is captured in UB#9:

(9) A non-value representation is read by an lvalue expression that does not have character

Likewise, UB#16 is more precise and comprehensive than UB#8:

(16) An lvalue designating an object of automatic storage duration that could have been declared with the register storage class is used in a context that requires the value of the designated object, but the object is uninitialized. (6.3.3.1).

Both of these UBs actually exist in the sections they are cited from.

Acknowledgments

I would like to thank Martin Uecker, who initially raised this issue.