

The New C Standard (Excerpted material)

An Economic and Cultural Commentary

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3.8

constraint **constraint**
restriction, either syntactic or semantic, by which the exposition of language elements is to be interpreted

Commentary

These are the constructs that a conforming translator must detect and issue a diagnostic for, if encountered during translation of the source. Constraint and syntax violations are the only kinds of construct, defined by the standard, for which an implementation is required to issue a diagnostic.

In C, constraints only appear in subclauses that have the heading Constraints. These appear in Clause 6, Language, but not Clause 7, Library. These language constraints are specified by use of the word *shall* within one of these subclauses. Violating a requirement specified using the word *shall* that appears within another kind of subclause causes undefined behavior.

shall

shall
outside constraint**C++**

The C++ Standard does not contain any constraints; it contains diagnosable rules.

1.3.14 well-
formed program

a C++ program constructed according to the syntax rules, diagnosable semantics rules, and the One Definition Rule (3.2).

However, the library does use the term constraints.

17.4.3 Constraints
on programs

This subclause describes restrictions on C++ programs that use the facilities of the C++ Standard Library.

17.4.4p1

This subclause describes the constraints upon, and latitude of, implementations of the C++ Standard library.

But they are not constraints in the C sense of requiring a diagnostic to be issued if they are violated. Like C, the C++ Standard does not require any diagnostics to be issued during program execution.

Coding Guidelines

There is a common, incorrectly, held belief that diagnostics are issued for violations of any requirement contained within the C Standard. Diagnostics need only be issued for violations of requirements contained within a Constraints clause. Educating developers of the differences between constraints and the other forms of behavior described in the standard is an issue that is outside the scope of these coding guidelines.

Usage

There are 134 instances of the word *shall* in a Constraints clause (out of 588 in the complete standard). This places a lower bound on the number of constraints that can be violated (some uses of *shall* describe more than one kind of construct).

References