

Defaulted Functions

Further Reading

- For more information on defaulted functions in the context of **move operations**, see the “Everything You Ever Wanted to Know About Move Semantics” talks by Howard Hinnant, [hinnant14](#) and [hinnant16](#).

Appendix

Implicit Generation of Special Member Functions

The rules a compiler uses to decide if a **special member function** should be generated implicitly are not entirely intuitive. Howard Hinnant, lead designer and author of the C++11 proposal for **move semantics**⁵ (among other proposals), produced a tabular representation⁶ of such rules in the situation where the user provides a single **special member function** and leaves the rest to the compiler. To understand Table 1, after picking a **special member function** in the first column, the corresponding row will show what is implicitly generated by the compiler.

Table 1: Implicit generation of special member functions

	Default Ctor	Destructor	Copy Ctor	Copy Assignment	Move Ctor	Move Assignment
Nothing	Defaulted	Defaulted	Defaulted	Defaulted	Defaulted	Defaulted
Any^a Ctor	Not Declared	Defaulted	Defaulted	Defaulted	Defaulted	Defaulted
Default Ctor	User Declared	Defaulted	Defaulted	Defaulted	Defaulted	Defaulted
Destructor	Defaulted	User Declared	Defaulted ^b	Defaulted ^b	Not Declared	Not Declared
Copy Ctor	Not Declared	Defaulted	User Declared	Defaulted ^b	Not Declared	Not Declared
Copy Assignment	Defaulted	Defaulted	Defaulted ^b	User Declared	Not Declared	Not Declared
Move Ctor	Not Declared	Defaulted	Deleted	Deleted	User Declared	Not Declared
Move Assignment	Defaulted	Defaulted	Deleted	Deleted	Not Declared	User Declared

^a Any nonspecial constructor

^b Deprecated behavior: compilers might warn upon reliance of this implicitly generated **member function**.

As an example, explicitly declaring a **copy-assignment operator** would result in the **default constructor**, **destructor**, and **copy constructor** being defaulted and in the **move operations** not being declared. If more than one **special member function** is **user declared**, regardless of whether or how it is implemented, the remaining generated **member functions** are

⁵[hinnant02](#)

⁶[hinnant16](#)