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register (keyword)

In the C programming language, **`register`** is a reserved word (or keyword), type modifier, storage class, and hint. The **`register`** keyword was deprecated in C++, until it became reserved and unused in C++17. It *suggests* that the compiler stores a declared variable in a CPU register (or some other faster location) instead of in random-access memory. If possible depending on the type of CPU and complexity of the program code, it will optimize access to that variable and hence improve the execution time of a program. In C (but not C++ where the keyword is essentially ignored) the location of a variable declared with `register` cannot be accessed, but the `sizeof` operator can be applied.[1] Aside from this limitation, `register` is essentially meaningless in modern compilers due to optimization which will place variables in a register if appropriate regardless of whether the hint is given. For programming of embedded systems `register` may still be significant; for example the Microchip MPLAB XC32 compiler allows the programmer to specify a particular register with the keyword; however, this is discouraged in favor of the compiler's optimizations.[2] When used, `register` is typically for loop counters, or possibly for other very frequently used variables in the code.

Examples

```c
/* store integer variable "i" in RAM, register, or other location as compiler sees fit */
int i;

/* suggests storing integer variable "i" in a CPU register or other fast location */
register int i;
```

See also

- Optimizing compiler
- Program optimization
- Static (keyword)

References

1. "INTERNATIONAL STANDARD ISO/IEC 9899:TC2" (http://www.open-std.org/jtc1/sc22/wg14/www/docs/n1124.pdf) (PDF).
2. "MPLAB® XC32 C/C++ Compiler User's Guide" (http://ww1.microchip.com/downloads/en/DeviceDoc/50001686J.pdf) (PDF). p. 170.