"Hello, World!" program

A **"Hello, World!" program** generally is a computer program that outputs or displays the message "Hello, World!". Because it is very simple in most programming languages, it is often used to illustrate the basic syntax of a programming language and is often the first program those learning to code write.[1][2]

A "Hello, World!" message being displayed through long-exposure light painting with a moving strip of LED lights

Contents

Purpose

A "Hello, World!" program is traditionally used to introduce novice programmers to a programming language.

"Hello, world!" is also traditionally used in a sanity test to make sure that a computer language is correctly installed, and that the operator understands how to use it.

History

While small test programs have existed since the development of programmable computers, the tradition of using the phrase "Hello, world!" as a test message was influenced by an example program in the seminal book *The C Programming Language*.[3] The example program from that book prints " `hello, world` " (without capital letters or exclamation mark), and was inherited[4] from a 1974 Bell Laboratories internal memorandum by Brian Kernighan, *Programming in C: A Tutorial*:[4]


"Hello, world" program by Brian Kernighan (1978)

```c
#include <stdio.h>

main( ) {
        printf("hello, world\n");
}
```

The C version was preceded by Kernighan's own 1972 *A Tutorial Introduction to the Language B*,[5] where the first known version of the program is found in an example used to illustrate external variables:

```
main(){
  extrn a,b,c;
  putchar(a); putchar(b); putchar(c); putchar('!*n');
  }

a 'hell';
b 'o, w';
c 'orld';
```

The program prints `hello, world!` on the terminal, including a newline character. The phrase is divided into multiple variables because in B, a character constant is limited to four ASCII characters. The previous example in the tutorial printed `hi!` on the terminal, and the phrase `hello, world!` was introduced as a slightly longer greeting that required several character constants for its expression.

The Jargon File claims that *hello, world* originated instead with BCPL (1967).[6]This claim is supported by the archived notes of the inventors of BCPL, Prof. Brian Kernighan at Princeton and Martin Richards at Cambridge.

For modern languages, hello, world programs vary in sophistication. For example, the Go programming language introduced a multilingual program,[7] Sun demonstrated a Java hello, world based on scalable vector graphics,[8] and the XL programming language features a spinning Earth hello, world using 3D graphics.[9] While some languages such as Perl, Python or Ruby may need only a single statement to print "hello, world", a low-level assembly language may require dozens of commands. Mark Guzdial and Elliot Soloway have suggested that the "hello, world" test message may be outdated now that graphics and sound can be manipulated as easily as text.[10]

Variations

A "Hello, world!" program running on Sony's PlayStation Portable as a proof of concept.

There are many variations on the punctuation and casing of the phrase. Variations include the presence or absence of the comma and exclamation mark, and the capitalization of the 'H', both the 'H' and the 'W', or neither. Some languages are forced to implement different forms, such as "HELLO WORLD", on systems that support only capital letters, while many "hello, world" programs in esoteric languages print out a slightly modified string. For example, the first non-trivial Malbolge program printed "HEllO WORld", this having been determined to be good enough.[11]

There are variations in spirit, as well. Functional programming languages, like Lisp, ML and Haskell, tend to substitute a factorial program for Hello, World, as functional programming emphasizes recursive techniques, whereas the original examples emphasize I/O, which violates the spirit of pure functional programming by producing side effects. Languages otherwise capable of Hello, World (Assembly, C, VHDL) may also be used in embedded systems, where text output is either difficult (requiring additional components or communication with another computer) or nonexistent. For devices such as microcontrollers, field-programmable gate arrays, and CPLD's, "Hello, World" may thus be substituted with a blinking LED, which demonstrates timing and interaction between components.[12][13][14][15][16]

The Debian and Ubuntu Linux distributions provide the "hello, world" program through the apt packaging system; this allows users to simply type "apt-get install hello" for the program to be installed, along with any software dependencies. While of itself useless, it serves as a sanity check and a simple example to newcomers of how to install a package. It is significantly more useful for developers, however, as it provides an example of how to create a .deb package, either traditionally or using debhelper, and the version of hello used, GNU Hello, serves as an example of how to write a GNU program.[17]

Time to Hello World

Time to "Hello World" (TTHW) is a metric for how long it takes to get a "Hello World" program running from scratch.[18]

See also

- "99 Bottles of Beer" as used in computer science
- Foobar
- Java Pet Store
- Just another Perl hacker
- List of basic computer science topics
- Trabb Pardo-Knuth algorithm
- List of hello world programs at Wikibooks

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External links

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