# Bull-GE-Bell B Language

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THE PROGRAMMING LANGUAGE B
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ABSTRACT

B is a computer language designed by D. M. Ritchie and K. L. Thompson, for primarily non-numeric applications such as system programming. These typically involve complex logical decision-making, and processing of integers, characters, and bit strings. On the H6070 TSS system, B programs are usually much easier to write and understand than assembly language programs, and object code efficiency is almost as good. Implementation of simple TSS subsystems is an especially appropriate use for B. This technical report contains a description of the MH-TSS (Honeywell 6070) version of B (by S. C. Johnson), and a tutorial introduction to most of the features of the language (by B. W. Kernighan).

DMR note, June 1997:
This WWW page is a rendition of Bell Laboratories Computing Science Technical Report #8: The Programming Language B, January, 1973. It was scanned using Adobe OCR software and the version here was edited by Dennis Ritchie. It is divided into two sections, each in several formats:

A Tutorial Introduction to the Language B, by Brian Kernighan, is browsable HTML; also available as PostScript or PDF.
User's Reference to B on MH-TSS, by Steve Johnson, is browsable HTML; also available in PostScript or PDF.

For scholars, the page images are also available:

PDF Tutorial is a scanned PDF image of the tutorial. Caution: 1.2MB in size.
PDF Reference is a scanned PDF image of the reference. Caution: 1.4MB in size.

The document seems to exist only on (partially) original paper printed on a Teletype model 37 terminal. It uses underlining for emphasis. You need to look at the PDF scans to verify any typos I might have introduced in cleaning up the OCR, which was pretty good except where there was underlining or double-quote characters; they tended to merge into the line above. I avoided the urge to redact the original except for a few obvious mistakes, in particular some missing semicolons in the syntax for some of the commands.

When this CSTR was issued, which was probably some months after the papers were written, the use of B was growing on the local Honeywell GCOS system. Its time-sharing facility was called MH-TSS here, and it was then the main computation facility at Bell Labs in Murray Hill, NJ. By this time, use of B in the early Unix system was already pretty much at an end; early C had already taken over (see The Development of the C Language). In fact, by September

1973, the operating system had already been translated into C and most of the B utilities converted.

The memos shown here were based on an earlier document, User's Reference to B, by Ken Thompson. The Unix dialect of B closely followed the Honeywell version described here--the compiler front-ends were the same, but of course the Unix system calls were present, and the GCOS-specific I/O stuff absent. The basic library must have looked very similar.

Indeed, there were never very many B programs on early Unix. The compiler itself was written in B, and a few of the utilities, for example the first /etc/glob, which expanded wild-card characters for the shell. This is because no compiler to machine code for the PDP-7 or PDP-11 was ever built; the Unix B compilers produced interpreted, threaded code that wasn't efficient enough to write a whole system in.

On the other hand, B, with a real compiler, flourished in a modest way on the Honeywell machines, as indicated by this CSTR. Moreover, it had direct use and even progeny elsewhere, especially at the University of Waterloo in Ontario. It apparently lives on today: see Thinkage Ltd. UW Tools Package, for example.

A final note of possible historical interest or amusement: so far as Brian and I can remember, the Tutorial contains the first instance of a "Hello, world" program.

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Last fiddled 29 May 2000, adding PDF distillations of the OCR.