Malbolge: the self modifying puzzle?

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Why?

- Because Intercal is too flexible
- BrainF*** is too intuitive

The First Program[1]

(=<‘$9]7<5YXz7wT.3,+O/o’K%$H"’~D|#z@b=‘{
ˆLx8%$Xmrkpohm-kNi;gsedcba‘_ ˆ]\[ZYXWVUTS
RQPONMLKJIHGFEDCBA@?>=<;:9876543s+O<oLm

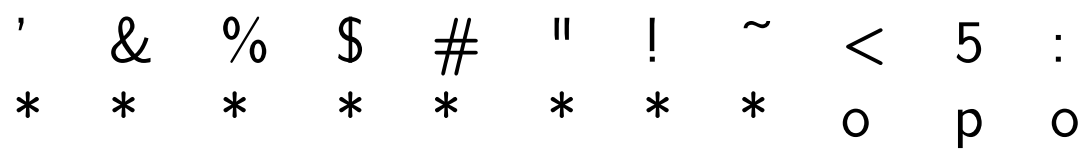
i needed more memory than my own laptop (32mb) i "borrowed" my work’s nt machine (96mb)

[1] `https://web.archive.org/web/20200807195658/http://acooke.org/hello-world.mb`

The Machine

- Registers - A C D
- eq? "Instruction memory" "Data Memory"
- Word has 10 trits

Normalization - non-canon



Instructions

j	data jump
i	jump
*	trinary rot
p	crazy op
<	read
/	write
v	stop
o	nop

The Crazy op

2

	0	1	2
0	1	0	0
1	1	0	2
2	2	2	1

[2] Documentation says don't look for patterns

Something to mention about the standard implementation

- Interesting approach to memory usage

  * - *rotates the trinary value of the cell pointed to by D to the right 1. The least significant trit becomes the most significant trit, and all others move one position to the left. After the instruction is executed, 33 is subtracted from the instruction at C, and the result is used as an index in the table below. The new character is then placed at C, and then C is incremented.*

- Memory initialization

On turing completeness

- Malbolge-T[3]
- Malbolge Unshackled
  - Compatibility problems

[3] lscheffer.com

Program construction method in obfuscated programming language Malbolge[4]

- Any tritwise op is composable
- xlat2 Cycles
- Loop tolerance
- Modules

[4] https://www.sakabe.i.is.nagoya-u.ac.jp/~nishida/DB/pdf/iizawa05ss2005-22.pdf

Could be worse[5] - Writing writers for code

- Short permutation Cycles
- Jmp doesn't self-modify
- Initialization through whitespace
- 2-Nop Cycles
- Immutable Nops
- Crazy OP has too many patterns
- Arithmetic through lookup

[5] lscheffer.com