86eForth on Visual Studio

Chen-Hanson Ting

SVFIG

September 24, 2016

86eForth Evolution

V1.0 1990, 16-bit 8086 on MASM

V2.3 1996, 16-bit 8086, simplified

V3.1 1996, 16-bit protected mode

V4.3 1996, 32-bit protected mode

V5.2 2016, 32-bit flat mode on Visual Studio

Purposes of 86eF v5.2

- Available for current Windows PCs
- Built on Visual Studio 2015 Community
- 32-bit flat memory mode
- Bare minimal word set
  - No multitasking
  - No vocabulary
  - Optimized if possible

Advantages in Visual Studio

- Visual Studio 2015 Community is free
- Multilanguage IDE
  - Visual C++
  - Visual C#
  - Visual Basic
  - Visual F#
- Targeting all other platforms

Problems of MASM in VS

- Buried in Visual C++
- No documentation
- Memory restrictions
  - .code Non-extensible
  - .data Non-executable
  - .stack

86eForth v5.2

- MASM assembler
- Indirect Thread Model
- Reduced word set, from 223 to 181
- 71 Code words, 110 colon words
- 13 System (user) variables
- Single thread dictionary
- In a CMD console window

Indirect Thread Model

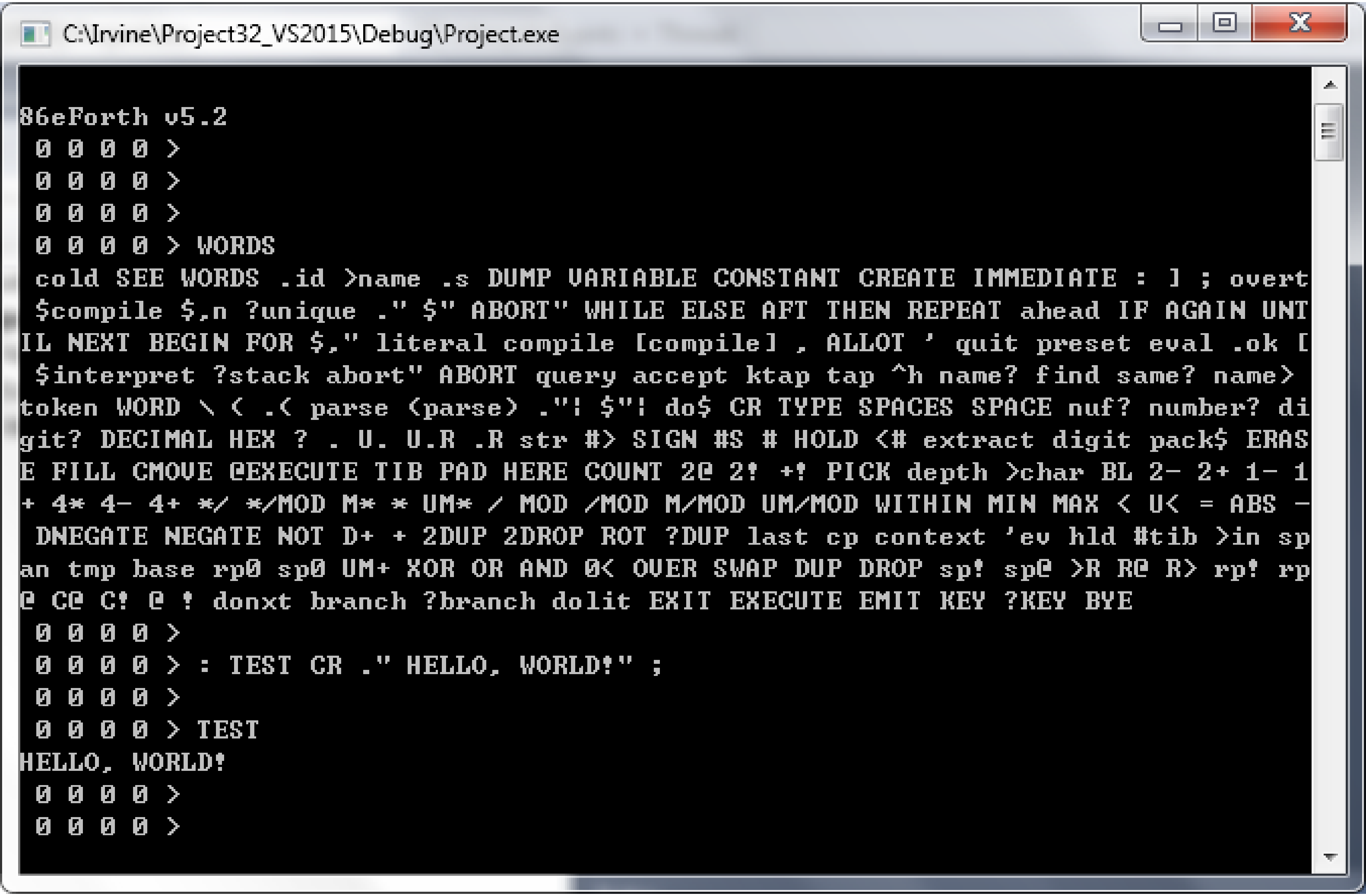
- All predefined words are in .code segment
- User can only add colon words in the .data segment
- No executable code in colon words

eForth and Zen, 3rd Ed.

- Based on 86eForth v5.2
- Go through all assembly source code, not Forth source code
- Better integration of text and assembly code

Demo

- Launch Visual Studio
- Assemble 86eForth502.asm
- Debug 86eForth502.exe
- Test examples
  - Hello
  - Logic
  - Loops



```

86eForth v5.2
 0 0 0 0 >
 0 0 0 0 >
 0 0 0 0 >
 0 0 0 0 > WORDS
 cold SEE WORDS .id >name .s DUMP VARIABLE CONSTANT CREATE IMMEDIATE : ] ; overt
 $compile $,n ?unique ." $" ABORT" WHILE ELSE AFT THEN REPEAT ahead IF AGAIN UNT
IL NEXT BEGIN FOR $," literal compile [compile] , ALLOT ' quit preset eval .ok [
 $interpret ?stack abort" ABORT query accept ktap tap ^h name? find same? name>
token WORD \ ( .( parse (parse) ."| $"| do$ CR TYPE SPACES SPACE nuf? number? di
git? DECIMAL HEX ? . U. U.R .R str #> SIGN #S # HOLD <# extract digit pack$ ERAS
E FILL CMOVE @EXECUTE TIB PAD HERE COUNT 2@ 2! +! PICK depth >char BL 2- 2+ 1- 1
+ 4* 4- 4+ */ */MOD M* * UM* / MOD /MOD M/MOD UM/MOD WITHIN MIN MAX < U< = ABS -
 DNEGATE NEGATE NOT D+ + 2DUP 2DROP ROT ?DUP last cp context 'ev hld #tib >in sp
an tmp base rp0 sp0 UM+ XOR OR AND 0< OVER SWAP DUP DROP sp! sp@ >R R@ R> rp! rp
@ C@ C! @ ! donxt branch ?branch dolit EXIT EXECUTE EMIT KEY ?KEY BYE
 0 0 0 0 >
 0 0 0 0 > : TEST CR ." HELLO, WORLD!" ;
 0 0 0 0 >
 0 0 0 0 > TEST
HELLO, WORLD!
 0 0 0 0 >
 0 0 0 0 >
```

Questions?

Thank you.