Forth Golfscript Interpreter

Golfscript

Code Golf

- shortest possible source code that implements an algorithm
- solving problems (holes) in as few keystrokes as possible

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Golfscript

- stack oriented, variables exist
- single symbols represent high level operations
- strong typed
- heavy use of operator overloading and type coercion

Golfscript Types

- ▶ Integer: 1 2
- Arrays: [1 2 3] [3]
- ▶ Strings: "one two three"
- ▶ Blocks: {1+}

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Golfscript Operator Example

- **▶** 12 3 * **->** 36
- ▶ [50 51 52]' '* -> "50 51 52"
- ► [1 2 3]{1+}/ -> 2 3 4
- ▶ {.@\%.}do; (n1 n2 -- gcd)

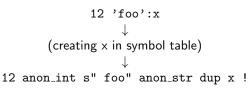
Forth Implementation

Typesystem

- Values as scalar references on stack
- Anonymous functions

Parser

- translates golfscript to forth execution tokens
- based on regular expression of reference implementation
- Responsible for:
 - ▶ infer initial type from syntax
 - symbol table for variable tracking
 - note that every value can be a variable!



Arrays

- Construction similar to postscript.
- ▶ [marks stack size,] collects back to marked size.
- ▶ Mark moves when stack becomes smaller:
 - 1 2 [\] -> [2 1]

Type Coercion and Overloading

- Typeorder for Coercion
- Coercion according to highest order type
- Heavy operator overloading results in wide range of functionality

Implementation Status in Percentage

Complex Overloaded ¹		Stack Operators		Loops & Conditionals		Math
· !	100	@	100	until	100	abs
=	88	\	100	while	100	base
~	100	;	100	do	100	rand
\$	0		100	if	100	
+	100					
=	75					
*	0					
/	0					
%	25					
,	75					
?	75					
(75					
)	75					
Ì	0					
&	0					
^	0					
<	0					
>	0					
and or xor	0					
zip	0					

Output

print

puts

100

100

100 100

 $^{^{1}\}mbox{Introspection}$ based features for Blocks have not been implemented.

Cutbacks

- Error Handling differs
- ▶ Introspective Block operations not implemnted

Usage of Idiomatic Forth

- Stack paradigma mapped to typed language
- Wordlists for variable tracking
- Macros & anonym functions for
 - ► language implementation
 - operator implementation