$ ./micro_macho
Hello world

Dissection of a hacky but valid Intel 32 bits, 164 bytes, Mach-O "Hello world" executable file.

```
$ shasum micro_macho
 e67bddcc7ba3f8446a63104108c2905f57baadbe
```

http://seriot.ch/hello_macho.php Nicolas Seriot, 2013-01-06 19:00

	Offset	Actual bytes	Struct	Field	Value	Comment	Summary
Mach Header	0x00	CE FA ED FE	mach_header	magic	MH_MAGIC	mach magic number identifier	Mach-O executable file, 32 bits, i386
	0x04	07 00 00 00		cputype	CPU_TYPE_I386	cpu specifier	
	0x08	03 00 00 00		cpusubtype	CPU_SUBTYPE_I386_ALL	machine specifier	
	0x0C	02 00 00 00		filetype	MH_EXECUTE	type of file	
	0x10	02 00 00 00		ncmds	2	number of load commands	
	0x14	88 00 00 00		sizeofcmds	0x88 (136)	the size of all the load commands	
	0x18	01 00 00 00		flags	MH_NOUNDEFS	flags	
Load Commands / LC_SEGMENT (__TEXT)	0x1C	01 00 00 00	segment_command	cmd	LC_SEGMENT	LC_SEGMENT	one .text segment to be loaded in a 1kB memory page
	0x20	38 00 00 00		cmdsize	0x38 (56)	includes sizeof section structs	
	0x24	48 65 6C 6C		segname	db 'Hell'	segment name	
	0x28	6F 20 77 6F			db 'o wo'		
	0x2C	72 6C 64 0A			db 'rld', 0Ah		
	0x30	00 FF FF FF			db 0		
	0x34	00 00 00 00		vmaddr	0x0	memory address of this segment	
	0x38	00 10 00 00		vmsize	0x1000	memory size of this segment	
	0x3C	00 00 00 00		fileoff	0x0	file offset of this segment	
	0x40	2E 00 00 00		filesize	0x2E (46)	amount to map from the file	
	0x44	07 FF FF FF		maxprot	rwx	maximum VM protection	
	0x48	05 FF FF FF		initprot	r-x	initial VM protection	
	0x4C	00 00 00 00		nsects	0	number of sections in segment	
	0x50	FF FF FF FF		flags		flags	
Load Commands / LC_UNIXTHREAD	0x54	05 00 00 00	thread_command	cmd	LC_UNIXTHREAD	LC_UNIXTHREAD	the initial state of the registers, the entry point $eip is at 0x68
	0x58	50 00 00 00		cmdsize	0x50 (80)	total size of this command	
	0x5C	01 00 00 00		flavor	x86_THREAD_STATE32	flavor of thread state	
	0x60	10 00 00 00		count	0x10 (16)	count of longs in thread state	
	0x64	FF 00 FF FF	i386_thread_state	eax	0		
	0x68	6A 0C 68 24		ebx			
	0x6C	00 00 00 6A		ecx			
	0x70	01 B0 04 83		edx			
	0x74	EC 04 CD 80		edi			
	0x78	83 C4 10 6A		esi			
	0x7C	00 EB 11 FF		ebp		jump 17 bytes	
	0x80	00 00 00 00		esp	0		
	0x84	FF FF FF FF		ss	0		
	0x88	FF 00 FF FF		eflags	0		
	0x8C	68 00 00 00		eip	0x68		
	0x90	B0 01 83 EC		cs			
	0x94	04 CD 80 FF		ds			
	0x98	FF FF FF FF		es	0		
	0x9C	00 00 FF FF		fs	0		
	0xA0	00 00 FF FF		gs	0		