

CS 24: Introduction to Computing Systems

Lecture 5 Exercises

Name:

NOTES.

(a) 0000000000000000 <mystery>:

0: 31 c9
2: 85 ff
4: 0f 95 c1
7: b8 ff ff ff ff
c: 0f 49 c1
f: c3

xor %ecx,%ecx
test %edi,%edi
setne %cl
mov \$0xffffffff,%eax
cmovns %ecx,%eax
retq

→ $ecx = 0$
→ Later comparison $edi \neq 0$
→ $ecx = (edi \neq 0)$
→ $eax = -1$
→ if $(edi \neq 0) \{ eax = ecx \}$
→ return eax

(b) 0000000000000000 <mystery>:

0: 39 fe
2: 89 f8
4: 0f 4e c6
7: c3

cmp %edi,%esi
mov %edi,%eax
cmovle %esi,%eax
retq

→ Later comparison $esi - edi \neq 0$
→ $eax = edi$
→ if $(esi \leq edi) \{ eax = esi \}$
→ return eax

(c) 00000000004004f0 <mystery>:

4004f0: 85 ff
4004f2: 74 08
4004f4: 0f af f7
4004f7: 83 c7 ff
4004fa: 75 f8
4004fc: 89 f0
4004fe: c3

test %edi,%edi
je 4004fc <mystery+0x0c>
imul %edi,%esi
add \$0xffffffff,%edi
jne 4004f4 <mystery+0x04>
mov %esi,%eax
retq

→ Later comparison: $edi \neq 0$
if $(edi == 0) \{$
 $eax = esi$
 return eax
}
do $esi = edi$
 $edi = esi - 1$ while $(edi != 0)$
return eax

(d) 0000000000000000 <mystery>:

0: 48 8b 07
3: 48 8b 16
6: 48 89 17
9: 48 89 06
c: c3

mov (%rdi),%rax
mov (%rsi),%rdx
mov %rdx,(%rdi)
mov %rax,(%rsi)
retq

0000000000000000 <mystery>:

0: 8b 07
2: 8b 16
4: 89 17
6: 89 06
8: c3

mov (%rdi),%eax
mov (%rsi),%edx
mov %edx,(%rdi)
mov %eax,(%rsi)
retq

0000000000000000 <mystery>:

0: 0f b7 07
3: 0f b7 16
6: 66 89 17
9: 66 89 06
c: c3

movzwl (%rdi),%eax
movzwl (%rsi),%edx
mov %dx,(%rdi)
mov %ax,(%rsi)
retq

next time

(e) 00000000004004f0 <mystery>:

4004f0: 83 ff 03	cmp	\$0x3,%edi
4004f3: 72 1e	jb	400513 <mystery+0x23>
4004f5: b1 01	mov	\$0x1,%cl
4004f7: 7c 17	j1	400510 <mystery+0x20>
4004f9: 89 fe	mov	%edi,%esi
4004fb: bf 02 00 00 00	mov	\$0x2,%edi
400500: 89 f0	mov	%esi,%eax
400502: 99	cltd	
400503: f7 ff	idiv	%edi
400505: 85 d2	test	%edx,%edx
400507: 74 0a	je	400513 <mystery+0x23>
400509: 83 c7 01	add	\$0x1,%edi
40050c: 39 f7	cmp	%esi,%edi
40050e: 7c f0	j1	400500 <mystery+0x10>
400510: 89 c8	mov	%ecx,%eax
400512: c3	retq	
400513: 31 c9	xor	%ecx,%ecx
400515: 89 c8	mov	%ecx,%eax
400517: c3	retq	