CS 341 Spring 2000
Homework Set 5
Solutions

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Exercise 3

Slide 1

instruction	
4	backward
9	forward
11	forward
15	backward

label	value
code_start	152
top	160
test	188

Exercise 10

Slide 2

- my_arr will be an offset from the start of the bss segment.
- No, it's still an offset from the start of the bss segment.
indx	sym	seg	off
0	i	bss	0
1	real_base	bss	4
2	my_arr	bss	-56
- you need a patch list entry for the STORE instruction pointing to my_arr in the symbol table

Exercise 12

Slide 3

Module 1

index	sym	type	flag	seg	off
0	str	I	U	–	–
1	str_len	E	D	text	0
2	top		D	text	16
3	test		D	text	28

Text

Sym index	offset
0	4
3	12

Module 2

index	sym	type	flag	seg	off
0	str	E	D	data	0
1	str_len	I	U	–	–

Text

Sym index	offset
0	1

Exercise 12 (cont)

Slide 4

Private 1

sym	type	seg	off
str_len	D	text	0
top	D	text	16
test	D	text	28

Private 2

sym	type	seg	off
str	D	data	0

Public

sym	type	seg	off
str_len	M1	text	0
str	M2	text	0

Exercise 13

Slide 5

(2, 42)	9480 + 42 = 9522
(0, 142)	1230 + 142 = 1372
(4, 652)	invalid: offset too large
(3, 100)	8710 + 100 = 8810
(5, 48)	invalid: no segment 5
(0, 18)	1230 + 18 = 1248
(2, 200)	invalid: offset too large
(3, 57)	8710 + 57 = 8767
(1, 92)	1230 + 92 = 1322
(4, 98)	2094 + 98 = 2192

Exercise 14

Slide 6

Logical address	Physical address
$1000 = 1 \times 512 + 488$	$15 \times 512 + 488 = 7680 + 488 = 8168$
$92 = 0 \times 512 + 92$	$20 \times 512 + 92 = 10240 + 92 = 10332$
$1024 = 2 \times 512 + 0$	$12 \times 512 + 0 = 6144$
$4090 = 7 \times 512 + 506$	$30 \times 512 + 506 = 15360 + 506 = 15866$
$5000 = 9 \times 512 + 392$	invalid (no entry for 9)
$4000 = 7 \times 512 + 416$	$30 \times 512 + 416 = 15360 + 416 = 15776$
$3000 = 5 \times 512 + 440$	$16 \times 512 + 440 = 8192 + 440 = 8632$
$3101 = 6 \times 512 + 29$	$18 \times 512 + 29 = 9216 + 29 = 9245$
$2045 = 3 \times 512 + 509$	$43 \times 512 + 509 = 22016 + 509 = 22525$
$2001 = 3 \times 512 + 465$	$43 \times 512 + 465 = 22016 + 465 = 22481$
$104 = 0 \times 512 + 104$	$20 \times 512 + 104 = 10240 + 104 = 10344$
$432 = 0 \times 512 + 432$	$20 \times 512 + 432 = 10240 + 432 = 10472$
$999 = 1 \times 512 + 487$	$15 \times 512 + 487 = 7680 + 487 = 8167$