

Lab Report 07

Assignment 1

Comments:

- Initially
 - o \$pc = 00400000, the beginning of main
 - o \$ra = 00000000
 - o \$sp = 7ffffeffc, the beginning of stack

Text Segment

Bkpt	Address	Code	Basic	Source
	0x00400000	0x2404ffff	addiu \$4,\$0,0xffff...	2: main: li \$a0, -45 # load input par...
	0x00400004	0x24010006	jal 0x00400019	3: jal \$a0 # jump and link ...
	0x00400008	0x00000000	nop	4: nop
	0x0040000c	0x00028020	add \$16,\$0,\$2	5: add \$a0, \$zero, \$v0
	0x00400010	0x24020006	addiu \$2,\$0,0x0000...	6: li \$v0, 10 # terminate
	0x00400014	0x00000000	syscall	7: syscall
	0x00400018	0x00041022	sub \$v0,\$zero,\$a0	15: sub \$v0, \$zero, \$a0 # put -(a0) in v0
	0x0040001c	0x04800002	bits \$a0,\$0	16: bits \$a0, done # if (a0) < 0 sh...
	0x00400020	0x00000000	nop	17: nop
	0x00400024	0x00001020	add \$v0,\$a0,\$zero	18: add \$v0, \$a0, \$zero # else put (a0) ...
	0x00400028	0x03e00008	je \$v0,\$a0	20: je \$v0

Data Segment

Address	Value (+0)	Value (+4)	Value (+8)	Value (+c)	Value (+10)	Value (+14)	Value (+18)	Value (+1c)
0x10010000	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000
0x10010004	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000
0x10010008	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000
0x1001000c	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000
0x10010010	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000
0x10010014	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000
0x10010018	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000
0x1001001c	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000
0x10010020	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000

Registers

Name	Number	Value
\$zero	0	0x00000000
\$at	1	0x00000000
\$v0	2	0x00000000
\$v1	3	0x00000000
\$a0	4	0x00400019
\$a1	5	0x00000000
\$a2	6	0x00000000
\$a3	7	0x00000000
\$a4	8	0x00000000
\$a5	9	0x00000000
\$a6	10	0x00000000
\$a7	11	0x00000000
\$t0	12	0x00000000
\$t1	13	0x00000000
\$t2	14	0x00000000
\$t3	15	0x00000000
\$t4	16	0x00000000
\$t5	17	0x00000000
\$t6	18	0x00000000
\$t7	19	0x00000000
\$t8	20	0x00000000
\$t9	21	0x00000000
\$s0	22	0x00000000
\$s1	23	0x00000000
\$s2	24	0x00000000
\$s3	25	0x00000000
\$s4	26	0x00000000
\$s5	27	0x00000000
\$s6	28	0x00000000
\$s7	29	0x00000000
\$s8	30	0x00000000
\$s9	31	0x00000000

Mars Messages

Assembly: operation completed successfully.

Assembly: assembling C:\Users\lmd\Desktop\Code\asm\week07\l1.asm

Assembly: operation completed successfully.

Text Segment

Bkpt	Address	Code	Basic	Source
	0x00400000	0x2404ffff	addiu \$4,\$0,0xffff...	2: main: li \$a0, -45 # load input par...
	0x00400004	0x24010006	jal 0x00400019	3: jal \$a0 # jump and link ...
	0x00400008	0x00000000	nop	4: nop
	0x0040000c	0x00028020	add \$16,\$0,\$2	5: add \$a0, \$zero, \$v0
	0x00400010	0x24020006	addiu \$2,\$0,0x0000...	6: li \$v0, 10 # terminate
	0x00400014	0x00000000	syscall	7: syscall
	0x00400018	0x00041022	sub \$v0,\$zero,\$a0	15: sub \$v0, \$zero, \$a0 # put -(a0) in v0
	0x0040001c	0x04800002	bits \$a0,\$0	16: bits \$a0, done # if (a0) < 0 sh...
	0x00400020	0x00000000	nop	17: nop
	0x00400024	0x00001020	add \$v0,\$a0,\$zero	18: add \$v0, \$a0, \$zero # else put (a0) ...
	0x00400028	0x03e00008	je \$v0,\$a0	20: je \$v0

Data Segment

Address	Value (+0)	Value (+4)	Value (+8)	Value (+c)	Value (+10)	Value (+14)	Value (+18)	Value (+1c)
0x10010000	0	0	0	0	0	0	0	0
0x10010004	0	0	0	0	0	0	0	0
0x10010008	0	0	0	0	0	0	0	0
0x1001000c	0	0	0	0	0	0	0	0
0x10010010	0	0	0	0	0	0	0	0
0x10010014	0	0	0	0	0	0	0	0
0x10010018	0	0	0	0	0	0	0	0
0x1001001c	0	0	0	0	0	0	0	0
0x10010020	0	0	0	0	0	0	0	0

Registers

Name	Number	Value
\$zero	0	0
\$at	1	0
\$v0	2	0
\$v1	3	0
\$a0	4	-45
\$a1	5	0
\$a2	6	0
\$a3	7	0
\$a4	8	0
\$a5	9	0
\$a6	10	0
\$a7	11	0
\$t0	12	0
\$t1	13	0
\$t2	14	0
\$t3	15	0
\$t4	16	0
\$t5	17	0
\$t6	18	0
\$t7	19	0
\$t8	20	0
\$t9	21	0
\$s0	22	0
\$s1	23	0
\$s2	24	0
\$s3	25	0
\$s4	26	0
\$s5	27	0
\$s6	28	268468224
\$s7	29	2147479541
\$s8	30	0
\$s9	31	0

Mars Messages

program is finished running (dropped off bottom) --

program is finished running --

C:\Users\lmd\Desktop\Code\asm\week07\at.asm - MARS 4.5

File Edit Run Settings Tools Help

Run speed at max (no interaction)

Edit Execute

Text Segment

Bkpt	Address	Code	Basic	Source
	0x00400000	0x2404fffd	addiu \$4,\$0,-45	2: main: li \$a0,-45 # load input par...
	0x00400004	0xc1000004	jal 0x00400018	3: jal abs # jump and link ..
	0x00400008	0x00000000	nop	4: nop
	0x0040000c	0x00028020	add \$16,\$0,\$2	5: add \$a0,\$zero,\$v0
	0x00400010	0x2402000a	addiu \$2,\$0,10	6: li \$v0,10 # terminate
	0x00400014	0x0000000c	syscall	7: syscall
	0x00400018	0x00041022	sub \$2,\$0,\$4	15: sub \$v0,\$zero,\$a0 # put -(a0) in v...
	0x0040001c	0x48000002	bits \$4,2	16: bits \$a0,\$done # if (a0) < 0 th...
	0x00400020	0x00000000	nop	17: nop
	0x00400024	0x00001020	add \$2,\$4,\$0	18: add \$v0,\$a0,\$zero # size put (a0) ..
	0x00400028	0x03e00008	jr \$31	20: jr \$ra

Labels

Label	Address
at.asm	
main	0x00400000
endmain	0x00400018
abs	0x00400018
done	0x00400028

☒ Data ☒ Text

Registers Coproc 1 Coproc 0

Name	Number	Value
\$zero	0	0
\$at	1	0
\$v0	2	0
\$v1	3	0
\$a0	4	-45
\$a1	5	0
\$a2	6	0
\$a3	7	0
\$t0	8	0
\$t1	9	0
\$t2	10	0
\$t3	11	0
\$t4	12	0
\$t5	13	0
\$t6	14	0
\$t7	15	0
\$s0	16	0
\$s1	17	0
\$s2	18	0
\$s3	19	0
\$s4	20	0
\$s5	21	0
\$s6	22	0
\$s7	23	0
\$s8	24	0
\$s9	25	0
\$k0	26	0
\$k1	27	0
\$gp	28	268460224
\$ap	29	2147479540
\$fp	30	0
\$ra	31	4194332
\$pc		4194332
\$hi		0
\$lo		0

Mars Messages Run I/O

-- program is finished running (dropped off bottom) --

Clear

-- program is finished running --

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File Edit Run Settings Tools Help

Run speed at max (no interaction)

Edit Execute

Text Segment

Bkpt	Address	Code	Basic	Source
	0x00400000	0x2404fffd	addiu \$4,\$0,-45	2: main: li \$a0,-45 # load input par...
	0x00400004	0xc1000004	jal 0x00400018	3: jal abs # jump and link ..
	0x00400008	0x00000000	nop	4: nop
	0x0040000c	0x00028020	add \$16,\$0,\$2	5: add \$a0,\$zero,\$v0
	0x00400010	0x2402000a	addiu \$2,\$0,10	6: li \$v0,10 # terminate
	0x00400014	0x0000000c	syscall	7: syscall
	0x00400018	0x00041022	sub \$2,\$0,\$4	15: sub \$v0,\$zero,\$a0 # put -(a0) in v...
	0x0040001c	0x48000002	bits \$4,2	16: bits \$a0,\$done # if (a0) < 0 th...
	0x00400020	0x00000000	nop	17: nop
	0x00400024	0x00001020	add \$2,\$4,\$0	18: add \$v0,\$a0,\$zero # size put (a0) ..
	0x00400028	0x03e00008	jr \$31	20: jr \$ra

Labels

Label	Address
at.asm	
main	0x00400000
endmain	0x00400018
abs	0x00400018
done	0x00400028

☒ Data ☒ Text

Registers Coproc 1 Coproc 0

Name	Number	Value
\$zero	0	0
\$at	1	0
\$v0	2	45
\$v1	3	0
\$a0	4	-45
\$a1	5	0
\$a2	6	0
\$a3	7	0
\$t0	8	0
\$t1	9	0
\$t2	10	0
\$t3	11	0
\$t4	12	0
\$t5	13	0
\$t6	14	0
\$t7	15	0
\$s0	16	0
\$s1	17	0
\$s2	18	0
\$s3	19	0
\$s4	20	0
\$s5	21	0
\$s6	22	0
\$s7	23	0
\$s8	24	0
\$s9	25	0
\$k0	26	0
\$k1	27	0
\$gp	28	268460224
\$ap	29	2147479540
\$fp	30	0
\$ra	31	4194332
\$pc		4194332
\$hi		0
\$lo		0

Mars Messages Run I/O

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Clear

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File Edit Run Settings Tools Help

Run speed at max (no interaction)

Edit Execute

Text Segment

Bkpt	Address	Code	Basic	Source
	0x00400000	0x2404fffd	addiu \$4,\$0,-45	2: main: li \$a0, -45 # load input par...
	0x00400004	0xc1000004	jal 0x00400018	3: jal abs # jump and link...
	0x00400008	0x00000000	nop	4: nop
	0x0040000c	0x00028020	add \$16,\$0,\$2	5: add \$a0, \$zero, \$v0
	0x00400010	0x2402000a	addiu \$2,\$0,10	6: li \$v0, 10 # terminate
	0x00400014	0x0000000c	syscall	7: syscall
	0x00400018	0x00041022	sub \$v0,\$zero,\$a0	15: sub \$v0, \$zero, \$a0 # put -(a0) in v...
	0x0040001c	0x48000002	bits \$4,\$2	16: bits \$a0, done # if (a0) < 0 th...
	0x00400020	0x00000000	nop	17: nop
	0x00400024	0x00001020	add \$v0,\$a0,\$zero	18: add \$v0, \$a0, \$zero # else put (a0)...
	0x00400028	0x03e00008	jr \$31	20: jr \$ra

Labels

Label	Address
main	0x00400000
endmain	0x00400018
abs	0x00400018
done	0x00400028

☒ Data ☒ Text

Registers Coproc 1 Coproc 0

Name	Number	Value
\$zero	0	0
\$at	1	0
\$v0	2	45
\$v1	3	0
\$a0	4	-45
\$a1	5	0
\$a2	6	0
\$a3	7	0
\$t0	8	0
\$t1	9	0
\$t2	10	0
\$t3	11	0
\$t4	12	0
\$t5	13	0
\$t6	14	0
\$t7	15	0
\$s0	16	0
\$s1	17	0
\$s2	18	0
\$s3	19	0
\$s4	20	0
\$s5	21	0
\$s6	22	0
\$s7	23	0
\$s8	24	0
\$s9	25	0
\$k0	26	0
\$k1	27	0
\$gp	28	268460224
\$ap	29	2147479540
\$fp	30	0
\$ra	31	4194312
\$PC		4194312
\$hi		0
\$lo		0

Mars Messages Run I/O

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File Edit Run Settings Tools Help

Run speed at max (no interaction)

Edit Execute

Text Segment

Bkpt	Address	Code	Basic	Source
	0x00400000	0x2404fffd	addiu \$4,\$0,-45	2: main: li \$a0, -45 # load input par...
	0x00400004	0xc1000004	jal 0x00400018	3: jal abs # jump and link...
	0x00400008	0x00000000	nop	4: nop
	0x0040000c	0x00028020	add \$16,\$0,\$2	5: add \$a0, \$zero, \$v0
	0x00400010	0x2402000a	addiu \$2,\$0,10	6: li \$v0, 10 # terminate
	0x00400014	0x0000000c	syscall	7: syscall
	0x00400018	0x00041022	sub \$v0,\$zero,\$a0	15: sub \$v0, \$zero, \$a0 # put -(a0) in v...
	0x0040001c	0x48000002	bits \$4,\$2	16: bits \$a0, done # if (a0) < 0 th...
	0x00400020	0x00000000	nop	17: nop
	0x00400024	0x00001020	add \$v0,\$a0,\$zero	18: add \$v0, \$a0, \$zero # else put (a0)...
	0x00400028	0x03e00008	jr \$31	20: jr \$ra

Labels

Label	Address
main	0x00400000
endmain	0x00400018
abs	0x00400018
done	0x00400028

☒ Data ☒ Text

Registers Coproc 1 Coproc 0

Name	Number	Value
\$zero	0	0
\$at	1	0
\$v0	2	45
\$v1	3	0
\$a0	4	-45
\$a1	5	0
\$a2	6	0
\$a3	7	0
\$t0	8	0
\$t1	9	0
\$t2	10	0
\$t3	11	0
\$t4	12	0
\$t5	13	0
\$t6	14	0
\$t7	15	0
\$s0	16	0
\$s1	17	0
\$s2	18	0
\$s3	19	0
\$s4	20	0
\$s5	21	0
\$s6	22	0
\$s7	23	0
\$s8	24	0
\$s9	25	0
\$k0	26	0
\$k1	27	0
\$gp	28	268460224
\$ap	29	2147479540
\$fp	30	0
\$ra	31	4194312
\$PC		4194312
\$hi		0
\$lo		0

Mars Messages Run I/O

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Clear

-- program is finished running --

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File Edit Run Settings Tools Help

Run speed at max (no interaction)

Edit Execute

Text Segment

Bkpt	Address	Code	Basic	Source
	0x00400000	0x2404fffd3	addiu \$4,\$0,-45	2: main: li \$a0,-45 # load input par...
	0x00400004	0xc1000004	jal 0x00400018	3: jal abs # jump and link ..
	0x00400008	0x00000000	nop	4: nop
	0x0040000c	0x00202020	add \$16,\$0,\$2	5: add \$a0,\$zero,\$v0
	0x00400010	0x24020000	addiu \$2,\$0,10	6: li \$v0,10 # terminate
	0x00400014	0x0000000c	syscall	7: syscall
	0x00400018	0x00041022	sub \$v0,\$zero,\$a0	15: sub \$v0,\$zero,\$a0 # put -(a0) in v...
	0x0040001c	0x48000002	bits \$a0,\$done	16: bits \$a0,\$done # if (a0) < 0 th...
	0x00400020	0x00000000	nop	17: nop
	0x00400024	0x00001020	add \$v0,\$a0,\$zero	18: add \$v0,\$a0,\$zero # else put (a0) ..
	0x00400028	0x003e0000b	jr \$ra	20: jr \$ra

Labels

Label	Address
main	0x00400000
endmain	0x00400018
abs	0x00400018
done	0x00400028

☒ Data ☒ Text

Registers Coproc 1 Coproc 0

Name	Number	Value
\$zero	0	0
\$at	1	0
\$v0	2	45
\$v1	3	0
\$a0	4	-45
\$a1	5	0
\$a2	6	0
\$a3	7	0
\$t0	8	0
\$t1	9	0
\$t2	10	0
\$t3	11	0
\$t4	12	0
\$t5	13	0
\$t6	14	0
\$t7	15	0
\$s0	16	0
\$s1	17	0
\$s2	18	0
\$s3	19	0
\$s4	20	0
\$s5	21	0
\$s6	22	0
\$s7	23	0
\$s8	24	0
\$s9	25	0
\$k0	26	0
\$k1	27	0
\$k2	28	0
\$k3	29	0
\$k4	30	0
\$k5	31	0
\$ra	31	0
\$pc		0
\$hi		0
\$lo		0

Data Segment

Address	Value (+0)	Value (+4)	Value (+8)	Value (+c)	Value (+10)	Value (+14)	Value (+18)	Value (+1c)
0x10010000	0	0	0	0	0	0	0	0
0x10010020	0	0	0	0	0	0	0	0
0x10010040	0	0	0	0	0	0	0	0
0x10010060	0	0	0	0	0	0	0	0
0x10010080	0	0	0	0	0	0	0	0
0x100100a0	0	0	0	0	0	0	0	0
0x100100c0	0	0	0	0	0	0	0	0
0x100100e0	0	0	0	0	0	0	0	0
0x10010100	0	0	0	0	0	0	0	0
0x10010120	0	0	0	0	0	0	0	0

0x10010000 (.data) ☒ Hexadecimal Addresses ☐ Hexadecimal Values ☐ ASCII

Mars Messages Run I/O

-- program is finished running (dropped off bottom) --

Clear

-- program is finished running --

Snipping Tool

Screenshot copied to clipboard and saved

Select here to mark up and share the image

C:\Users\lmd\Desktop\Code\asm\week07\01.asm - MARS 4.5

File Edit Run Settings Tools Help

Run speed at max (no interaction)

Edit Execute

Text Segment

Bkpt	Address	Code	Basic	Source
	0x00400000	0x2404fffd3	addiu \$4,\$0,-45	2: main: li \$a0,-45 # load input par...
	0x00400004	0xc1000004	jal 0x00400018	3: jal abs # jump and link ..
	0x00400008	0x00000000	nop	4: nop
	0x0040000c	0x00202020	add \$16,\$0,\$2	5: add \$a0,\$zero,\$v0
	0x00400010	0x24020000	addiu \$2,\$0,10	6: li \$v0,10 # terminate
	0x00400014	0x0000000c	syscall	7: syscall
	0x00400018	0x00041022	sub \$v0,\$zero,\$a0	15: sub \$v0,\$zero,\$a0 # put -(a0) in v...
	0x0040001c	0x48000002	bits \$a0,\$done	16: bits \$a0,\$done # if (a0) < 0 th...
	0x00400020	0x00000000	nop	17: nop
	0x00400024	0x00001020	add \$v0,\$a0,\$zero	18: add \$v0,\$a0,\$zero # else put (a0) ..
	0x00400028	0x003e0000b	jr \$ra	20: jr \$ra

Labels

Label	Address
main	0x00400000
endmain	0x00400018
abs	0x00400018
done	0x00400028

☒ Data ☒ Text

Registers Coproc 1 Coproc 0

Name	Number	Value
\$zero	0	0
\$at	1	0
\$v0	2	45
\$v1	3	0
\$a0	4	-45
\$a1	5	0
\$a2	6	0
\$a3	7	0
\$t0	8	0
\$t1	9	0
\$t2	10	0
\$t3	11	0
\$t4	12	0
\$t5	13	0
\$t6	14	0
\$t7	15	0
\$s0	16	0
\$s1	17	0
\$s2	18	0
\$s3	19	0
\$s4	20	0
\$s5	21	0
\$s6	22	0
\$s7	23	0
\$s8	24	0
\$s9	25	0
\$k0	26	0
\$k1	27	0
\$k2	28	268660224
\$k3	29	2147479540
\$k4	30	0
\$k5	31	4194312
\$ra		4194320
\$pc		0
\$hi		0
\$lo		0

Data Segment

Address	Value (+0)	Value (+4)	Value (+8)	Value (+c)	Value (+10)	Value (+14)	Value (+18)	Value (+1c)
0x10010000	0	0	0	0	0	0	0	0
0x10010020	0	0	0	0	0	0	0	0
0x10010040	0	0	0	0	0	0	0	0
0x10010060	0	0	0	0	0	0	0	0
0x10010080	0	0	0	0	0	0	0	0
0x100100a0	0	0	0	0	0	0	0	0
0x100100c0	0	0	0	0	0	0	0	0
0x100100e0	0	0	0	0	0	0	0	0
0x10010100	0	0	0	0	0	0	0	0
0x10010120	0	0	0	0	0	0	0	0

0x10010000 (.data) ☒ Hexadecimal Addresses ☐ Hexadecimal Values ☐ ASCII

Mars Messages Run I/O

-- program is finished running (dropped off bottom) --

Clear

-- program is finished running --

C:\Users\lmd\Desktop\Code\asm\week07\az2.asm - MARS 4.5

File Edit Run Settings Tools Help

Run speed at max (no interaction)

Edit Execute

Text Segment

Bkpt	Address	Code	Basic	Source
	0x00400000	0x26040002	addiu \$4,\$0,2	2: main: li \$a0, 2 # load test input
	0x00400004	0x24050006	addiu \$5,\$0,6	3: li \$a1, 6
	0x00400008	0x24060009	addiu \$6,\$0,9	4: li \$a2, 9
	0x0040000c	0x0e100007	jal 0x0040001c	5: jal max # call max proc...
	0x00400010	0x00000000	nop	6: nop
	0x00400014	0x2402000a	addiu \$2,\$0,10	7: li \$v0, 10 # terminate
	0x00400018	0x00000000	syscall	8: syscall
	0x0040001c	0x00010020	add \$2,\$0,\$0	17: max: add \$v0, \$a0, \$zero # copy (a0) in v...
	0x00400020	0x00a24002	sub \$2,\$0,\$a1	18: sub \$2,\$0, \$a1, \$v0 # compute (a1 - v...
	0x00400024	0x05000002	bltz \$2,0	19: bltz \$2,0, okay # if (a1) - (v0)...
	0x00400028	0x00000000	nop	20: nop
	0x0040002c	0x00a01020	add \$2,\$5,\$0	21: add \$v0, \$a1, \$zero # else (a1) is i...

Labels

Label	Address
a2.asm	
main	0x00400000
endmain	0x0040001c
max	0x0040001c
okay	0x00400020
done	0x0040002c

☒ Data ☒ Text

Data Segment

Address	Value (+0)	Value (+4)	Value (+8)	Value (+c)	Value (+10)	Value (+14)	Value (+18)	Value (+1c)
0x10010000	0	0	0	0	0	0	0	0
0x10010020	0	0	0	0	0	0	0	0
0x10010040	0	0	0	0	0	0	0	0
0x10010060	0	0	0	0	0	0	0	0
0x10010080	0	0	0	0	0	0	0	0
0x100100a0	0	0	0	0	0	0	0	0
0x100100c0	0	0	0	0	0	0	0	0
0x100100e0	0	0	0	0	0	0	0	0
0x10010100	0	0	0	0	0	0	0	0
0x10010120	0	0	0	0	0	0	0	0

0x10010000 (.data) ☒ Hexadecimal Addresses ☐ Hexadecimal Values ☐ ASCII

Mars Messages Run I/O

Clear

-- program is finished running --

-- program is finished running --

Registers Coproc 1 Coproc 0

Name	Number	Value
\$zero	0	0
\$at	1	0
\$v0	2	0
\$v1	3	0
\$a0	4	0
\$a1	5	0
\$a2	6	0
\$a3	7	0
\$a0	8	0
\$t1	9	0
\$t2	10	0
\$t3	11	0
\$t4	12	0
\$t5	13	0
\$t6	14	0
\$t7	15	0
\$s0	16	0
\$a1	17	0
\$a2	18	0
\$a3	19	0
\$a4	20	0
\$a5	21	0
\$a6	22	0
\$a7	23	0
\$s8	24	0
\$t9	25	0
\$k0	26	0
\$k1	27	0
\$gp	28	268460224
\$ap	29	2147479540
\$fp	30	0
\$ra	31	0
\$PC		4194304
\$hi		0
\$lo		0

C:\Users\lmd\Desktop\Code\asm\week07\az2.asm - MARS 4.5

File Edit Run Settings Tools Help

Run speed at max (no interaction)

Edit Execute

Text Segment

Bkpt	Address	Code	Basic	Source
	0x00400000	0x26040002	addiu \$4,\$0,2	2: main: li \$a0, 2 # load test input
	0x00400004	0x24050006	addiu \$5,\$0,6	3: li \$a1, 6
	0x00400008	0x24060009	addiu \$6,\$0,9	4: li \$a2, 9
	0x0040000c	0x0e100007	jal 0x0040001c	5: jal max # call max proc...
	0x00400010	0x00000000	nop	6: nop
	0x00400014	0x2402000a	addiu \$2,\$0,10	7: li \$v0, 10 # terminate
	0x00400018	0x00000000	syscall	8: syscall
	0x0040001c	0x00010020	add \$2,\$0,\$0	17: max: add \$v0, \$a0, \$zero # copy (a0) in v...
	0x00400020	0x00a24002	sub \$2,\$0,\$a1	18: sub \$2,\$0, \$a1, \$v0 # compute (a1 - v...
	0x00400024	0x05000002	bltz \$2,0	19: bltz \$2,0, okay # if (a1) - (v0)...
	0x00400028	0x00000000	nop	20: nop
	0x0040002c	0x00a01020	add \$2,\$5,\$0	21: add \$v0, \$a1, \$zero # else (a1) is i...

Labels

Label	Address
a2.asm	
main	0x00400000
endmain	0x0040001c
max	0x0040001c
okay	0x00400020
done	0x0040002c

☒ Data ☒ Text

Data Segment

Address	Value (+0)	Value (+4)	Value (+8)	Value (+c)	Value (+10)	Value (+14)	Value (+18)	Value (+1c)
0x10010000	0	0	0	0	0	0	0	0
0x10010020	0	0	0	0	0	0	0	0
0x10010040	0	0	0	0	0	0	0	0
0x10010060	0	0	0	0	0	0	0	0
0x10010080	0	0	0	0	0	0	0	0
0x100100a0	0	0	0	0	0	0	0	0
0x100100c0	0	0	0	0	0	0	0	0
0x100100e0	0	0	0	0	0	0	0	0
0x10010100	0	0	0	0	0	0	0	0
0x10010120	0	0	0	0	0	0	0	0

0x10010000 (.data) ☒ Hexadecimal Addresses ☐ Hexadecimal Values ☐ ASCII

Mars Messages Run I/O

Clear

-- program is finished running --

-- program is finished running --

Registers Coproc 1 Coproc 0

Name	Number	Value
\$zero	0	0
\$at	1	0
\$v0	2	0
\$v1	3	0
\$a0	4	0
\$a1	5	0
\$a2	6	0
\$a3	7	0
\$a0	8	0
\$t1	9	0
\$t2	10	0
\$t3	11	0
\$t4	12	0
\$t5	13	0
\$t6	14	0
\$t7	15	0
\$s0	16	0
\$a1	17	0
\$a2	18	0
\$a3	19	0
\$a4	20	0
\$a5	21	0
\$a6	22	0
\$a7	23	0
\$s8	24	0
\$t9	25	0
\$k0	26	0
\$k1	27	0
\$gp	28	268460224
\$ap	29	2147479540
\$fp	30	0
\$ra	31	0
\$PC		4194312
\$hi		0
\$lo		0

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File Edit Run Settings Tools Help

Run speed at max (no interaction)

Edit Execute

Text Segment

Bkpt	Address	Code	Basic	Source
	0x00400000	0x26040002	addiu \$4,\$0,2	2: main: li \$a0, 2 # load test input
	0x00400004	0x24050006	addiu \$5,\$0,6	3: li \$a1, 6
	0x00400008	0x24060009	addiu \$6,\$0,9	4: li \$a2, 9
	0x0040000c	0x0e100007	jal 0x0040001c	5: jal max # call max proc...
	0x00400010	0x00000000	nop	6: nop
	0x00400014	0x2402000a	addiu \$2,\$0,10	7: li \$v0, 10 # terminate
	0x00400018	0x00000000	syscall	8: syscall
	0x0040001c	0x00010020	add \$2,\$4,\$0	17: max: add \$v0, \$a0, \$zero # copy (A0) in v...
	0x00400020	0x00a24002	sub \$8,\$5,\$2	18: sub \$t0, \$a1, \$v0 # compute (a1 - v...
	0x00400024	0x05000002	bne \$8,\$0	19: bne \$t0, \$zero # if (a1) - (v0)...
	0x00400028	0x00000000	nop	20: nop
	0x0040002c	0x00a01020	add \$2,\$5,\$0	21: add \$v0, \$a1, \$zero # else (a1) is i...

Labels

Label	Address
main	0x00400000
endmain	0x0040001c
max	0x0040001c
okay	0x00400020
done	0x0040002c

☒ Data ☒ Text

Data Segment

Address	Value (+0)	Value (+4)	Value (+8)	Value (+c)	Value (+10)	Value (+14)	Value (+18)	Value (+1c)
0x10010000	0	0	0	0	0	0	0	0
0x10010020	0	0	0	0	0	0	0	0
0x10010040	0	0	0	0	0	0	0	0
0x10010060	0	0	0	0	0	0	0	0
0x10010080	0	0	0	0	0	0	0	0
0x100100a0	0	0	0	0	0	0	0	0
0x100100c0	0	0	0	0	0	0	0	0
0x100100e0	0	0	0	0	0	0	0	0
0x10010100	0	0	0	0	0	0	0	0
0x10010120	0	0	0	0	0	0	0	0

Mars Messages Run I/O

Clear

-- program is finished running --

-- program is finished running --

Registers Coproc 1 Coproc 0

Name	Number	Value
\$zero	0	0
\$at	1	0
\$v0	2	0
\$v1	3	0
\$a0	4	2
\$a1	5	6
\$a2	6	9
\$a3	7	0
\$t0	8	0
\$t1	9	0
\$t2	10	0
\$t3	11	0
\$t4	12	0
\$t5	13	0
\$t6	14	0
\$t7	15	0
\$s0	16	0
\$s1	17	0
\$s2	18	0
\$s3	19	0
\$s4	20	0
\$s5	21	0
\$s6	22	0
\$s7	23	0
\$s8	24	0
\$s9	25	0
\$k0	26	0
\$k1	27	0
\$gp	28	268460224
\$ap	29	2147479540
\$fp	30	0
\$ra	31	0
pc		4194316
hi		0
lo		0

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File Edit Run Settings Tools Help

Run speed at max (no interaction)

Edit Execute

Text Segment

Bkpt	Address	Code	Basic	Source
	0x00400000	0x26040002	addiu \$4,\$0,2	2: main: li \$a0, 2 # load test input
	0x00400004	0x24050006	addiu \$5,\$0,6	3: li \$a1, 6
	0x00400008	0x24060009	addiu \$6,\$0,9	4: li \$a2, 9
	0x0040000c	0x0e100007	jal 0x0040001c	5: jal max # call max proc...
	0x00400010	0x00000000	nop	6: nop
	0x00400014	0x2402000a	addiu \$2,\$0,10	7: li \$v0, 10 # terminate
	0x00400018	0x00000000	syscall	8: syscall
	0x0040001c	0x00010020	add \$2,\$4,\$0	17: max: add \$v0, \$a0, \$zero # copy (A0) in v...
	0x00400020	0x00a24002	sub \$8,\$5,\$2	18: sub \$t0, \$a1, \$v0 # compute (a1 - v...
	0x00400024	0x05000002	bne \$8,\$0	19: bne \$t0, \$zero # if (a1) - (v0)...
	0x00400028	0x00000000	nop	20: nop
	0x0040002c	0x00a01020	add \$2,\$5,\$0	21: add \$v0, \$a1, \$zero # else (a1) is i...

Labels

Label	Address
main	0x00400000
endmain	0x0040001c
max	0x0040001c
okay	0x00400020
done	0x0040002c

☒ Data ☒ Text

Data Segment

Address	Value (+0)	Value (+4)	Value (+8)	Value (+c)	Value (+10)	Value (+14)	Value (+18)	Value (+1c)
0x10010000	0	0	0	0	0	0	0	0
0x10010020	0	0	0	0	0	0	0	0
0x10010040	0	0	0	0	0	0	0	0
0x10010060	0	0	0	0	0	0	0	0
0x10010080	0	0	0	0	0	0	0	0
0x100100a0	0	0	0	0	0	0	0	0
0x100100c0	0	0	0	0	0	0	0	0
0x100100e0	0	0	0	0	0	0	0	0
0x10010100	0	0	0	0	0	0	0	0
0x10010120	0	0	0	0	0	0	0	0

Mars Messages Run I/O

Clear

-- program is finished running --

-- program is finished running --

Registers Coproc 1 Coproc 0

Name	Number	Value
\$zero	0	0
\$at	1	0
\$v0	2	0
\$v1	3	0
\$a0	4	2
\$a1	5	6
\$a2	6	9
\$a3	7	0
\$t0	8	0
\$t1	9	0
\$t2	10	0
\$t3	11	0
\$t4	12	0
\$t5	13	0
\$t6	14	0
\$t7	15	0
\$s0	16	0
\$s1	17	0
\$s2	18	0
\$s3	19	0
\$s4	20	0
\$s5	21	0
\$s6	22	0
\$s7	23	0
\$s8	24	0
\$s9	25	0
\$k0	26	0
\$k1	27	0
\$gp	28	268460224
\$ap	29	2147479540
\$fp	30	0
\$ra	31	4194332
pc		4194332
hi		0
lo		0

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File Edit Run Settings Tools Help

Run speed at max (no interaction)

Edit Execute

Text Segment

Bkpt	Address	Code	Basic	Source
	0x00400000	0x24040002	addiu \$4,\$0,2	2: main: li \$a0, 2 # load test input
	0x00400004	0x24050006	addiu \$5,\$0,6	3: li \$a1, 6
	0x00400008	0x24060009	addiu \$6,\$0,9	4: li \$a2, 9
	0x0040000c	0x0c100007	jal max	5: jal max # call max proc...
	0x00400010	0x00000000	nop	6: nop
	0x00400014	0x2402000a	addiu \$2,\$0,10	7: li \$v0, 10 # terminate
	0x00400018	0x00000000	syscall	8: syscall
	0x0040001c	0x0c01000d	add \$2,\$0,\$0	17: max: add \$v0, \$a0, \$zero # copy (a0) in v...
	0x00400020	0x00a28002	sub \$8,\$0,\$2	18: sub \$t0, \$a1, \$v0 # compute (a1 - v0)
	0x00400024	0x05000002	bne \$8,\$0	19: bne \$t0, \$zero # if (a1) - (v0)...
	0x00400028	0x00000000	nop	20: nop
	0x0040002c	0x00a01020	add \$2,\$5,\$0	21: add \$v0, \$a1, \$zero # else (a1) is i...

Labels

Label	Address
main	0x00400000
endmain	0x0040001e
max	0x0040001c
okay	0x00400030
done	0x00400040

☒ Data ☒ Text

Data Segment

Address	Value (+0)	Value (+4)	Value (+8)	Value (+c)	Value (+10)	Value (+14)	Value (+18)	Value (+1c)
0x10010000	0	0	0	0	0	0	0	0
0x10010020	0	0	0	0	0	0	0	0
0x10010040	0	0	0	0	0	0	0	0
0x10010060	0	0	0	0	0	0	0	0
0x10010080	0	0	0	0	0	0	0	0
0x100100a0	0	0	0	0	0	0	0	0
0x100100c0	0	0	0	0	0	0	0	0
0x100100e0	0	0	0	0	0	0	0	0
0x10010100	0	0	0	0	0	0	0	0
0x10010120	0	0	0	0	0	0	0	0

☒ Hexadecimal Addresses ☐ Hexadecimal Values ☐ ASCII

Mars Messages Run I/O

Clear

-- program is finished running --

-- program is finished running --

Registers Coproc 1 Coproc 0

Name	Number	Value
\$zero	0	0
\$at	1	0
\$v0	2	2
\$v1	3	0
\$a0	4	0
\$a1	5	6
\$a2	6	9
\$a3	7	0
\$t0	8	0
\$t1	9	0
\$t2	10	0
\$t3	11	0
\$t4	12	0
\$t5	13	0
\$t6	14	0
\$t7	15	0
\$s0	16	0
\$s1	17	0
\$s2	18	0
\$s3	19	0
\$s4	20	0
\$s5	21	0
\$s6	22	0
\$s7	23	0
\$s8	24	0
\$s9	25	0
\$k0	26	0
\$k1	27	0
\$gp	28	268460224
\$ap	29	2147479540
\$fp	30	0
\$ra	31	4194320
\$pc		4194336
\$hi		0
\$lo		0

C:\Users\lmd\Desktop\Code\asm\week07\az2.asm - MARS 4.5

File Edit Run Settings Tools Help

Run speed at max (no interaction)

Edit Execute

Text Segment

Bkpt	Address	Code	Basic	Source
	0x00400000	0x24040002	addiu \$4,\$0,2	2: main: li \$a0, 2 # load test input
	0x00400004	0x24050006	addiu \$5,\$0,6	3: li \$a1, 6
	0x00400008	0x24060009	addiu \$6,\$0,9	4: li \$a2, 9
	0x0040000c	0x0c100007	jal max	5: jal max # call max proc...
	0x00400010	0x00000000	nop	6: nop
	0x00400014	0x2402000a	addiu \$2,\$0,10	7: li \$v0, 10 # terminate
	0x00400018	0x00000000	syscall	8: syscall
	0x0040001c	0x0c01000d	add \$2,\$0,\$0	17: max: add \$v0, \$a0, \$zero # copy (a0) in v...
	0x00400020	0x00a28002	sub \$8,\$0,\$2	18: sub \$t0, \$a1, \$v0 # compute (a1 - v0)
	0x00400024	0x05000002	bne \$8,\$0	19: bne \$t0, \$zero # if (a1) - (v0)...
	0x00400028	0x00000000	nop	20: nop
	0x0040002c	0x00a01020	add \$2,\$5,\$0	21: add \$v0, \$a1, \$zero # else (a1) is i...

Labels

Label	Address
main	0x00400000
endmain	0x0040001e
max	0x0040001c
okay	0x00400030
done	0x00400040

☒ Data ☒ Text

Data Segment

Address	Value (+0)	Value (+4)	Value (+8)	Value (+c)	Value (+10)	Value (+14)	Value (+18)	Value (+1c)
0x10010000	0	0	0	0	0	0	0	0
0x10010020	0	0	0	0	0	0	0	0
0x10010040	0	0	0	0	0	0	0	0
0x10010060	0	0	0	0	0	0	0	0
0x10010080	0	0	0	0	0	0	0	0
0x100100a0	0	0	0	0	0	0	0	0
0x100100c0	0	0	0	0	0	0	0	0
0x100100e0	0	0	0	0	0	0	0	0
0x10010100	0	0	0	0	0	0	0	0
0x10010120	0	0	0	0	0	0	0	0

☒ Hexadecimal Addresses ☐ Hexadecimal Values ☐ ASCII

Mars Messages Run I/O

Clear

-- program is finished running --

-- program is finished running --

Registers Coproc 1 Coproc 0

Name	Number	Value
\$zero	0	0
\$at	1	0
\$v0	2	2
\$v1	3	0
\$a0	4	0
\$a1	5	6
\$a2	6	9
\$a3	7	0
\$t0	8	0
\$t1	9	0
\$t2	10	0
\$t3	11	0
\$t4	12	0
\$t5	13	0
\$t6	14	0
\$t7	15	0
\$s0	16	0
\$s1	17	0
\$s2	18	0
\$s3	19	0
\$s4	20	0
\$s5	21	0
\$s6	22	0
\$s7	23	0
\$s8	24	0
\$s9	25	0
\$k0	26	0
\$k1	27	0
\$gp	28	268460224
\$ap	29	2147479540
\$fp	30	0
\$ra	31	4194320
\$pc		4194336
\$hi		0
\$lo		0

Snipping Tool

Screenshot copied to clipboard and saved

Select here to mark up and share the image

C:\Users\lmd\Desktop\Code\asm\week07\azasm - MARS 4.5

File Edit Run Settings Tools Help

Run speed at max (no interaction)

Edit Execute

Text Segment

Bkpt	Address	Code	Basic	Source
	0x00400000	0x24040002	addiu \$4,\$0,2	2: main: li \$a0, 2 # load test input
	0x00400004	0x24050006	addiu \$5,\$0,6	3: li \$a1, 6
	0x00400008	0x24060009	addiu \$6,\$0,9	4: li \$a2, 9
	0x0040000c	0x0c100007	jal max	5: jal max # call max proc...
	0x00400010	0x00000000	nop	6: nop
	0x00400014	0x2402000a	addiu \$2,\$0,10	7: li \$v0, 10 # terminate
	0x00400018	0x00000000	syscall	8: syscall
	0x0040001c	0x00010020	add \$2,\$0,20	17: max: add \$v0, \$a0, \$zero # copy (A0) in v...
	0x00400020	0x00a24002	sub \$t0,\$a1,\$v0	18: sub \$t0, \$a1, \$v0 # compute (a1 - v0)
	0x00400024	0x05000002	bne \$t0,\$zero	19: bne \$t0, \$zero # if (a1) - (v0)...
	0x00400028	0x00000000	nop	20: nop
	0x0040002c	0x00a01020	add \$2,\$0,20	21: add \$v0, \$a1, \$zero # else (a1) is i...

Labels

Label	Address
main	0x00400000
endmain	0x0040001c
max	0x0040001c
okay	0x00400020
done	0x0040002c

☒ Data ☒ Text

Data Segment

Address	Value (+0)	Value (+4)	Value (+8)	Value (+c)	Value (+10)	Value (+14)	Value (+18)	Value (+1c)
0x10010000	0	0	0	0	0	0	0	0
0x10010020	0	0	0	0	0	0	0	0
0x10010040	0	0	0	0	0	0	0	0
0x10010060	0	0	0	0	0	0	0	0
0x10010080	0	0	0	0	0	0	0	0
0x100100a0	0	0	0	0	0	0	0	0
0x100100c0	0	0	0	0	0	0	0	0
0x100100e0	0	0	0	0	0	0	0	0
0x10010100	0	0	0	0	0	0	0	0
0x10010120	0	0	0	0	0	0	0	0

Mars Messages Run I/O

Clear

-- program is finished running --

-- program is finished running --

Registers Coproc 1 Coproc 0

Name	Number	Value
\$zero	0	0
\$at	1	0
\$v0	2	2
\$v1	3	0
\$a0	4	2
\$a1	5	6
\$a2	6	9
\$a3	7	0
\$t0	8	4
\$t1	9	0
\$t2	10	0
\$t3	11	0
\$t4	12	0
\$t5	13	0
\$t6	14	0
\$t7	15	0
\$t8	16	0
\$t9	17	0
\$s0	18	0
\$s1	19	0
\$s2	20	0
\$s3	21	0
\$s4	22	0
\$s5	23	0
\$s6	24	0
\$s7	25	0
\$s8	26	0
\$s9	27	0
\$k0	28	0
\$k1	29	0
\$gp	30	268660224
\$ap	31	2147479540
\$fp	32	0
\$ra	33	4194320
\$pc	34	4194344
\$hi	35	0
\$lo	36	0

C:\Users\lmd\Desktop\Code\asm\week07\azasm - MARS 4.5

File Edit Run Settings Tools Help

Run speed at max (no interaction)

Edit Execute

Text Segment

Bkpt	Address	Code	Basic	Source
	0x00400000	0x24040002	addiu \$4,\$0,2	2: main: li \$a0, 2 # load test input
	0x00400004	0x24050006	addiu \$5,\$0,6	3: li \$a1, 6
	0x00400008	0x24060009	addiu \$6,\$0,9	4: li \$a2, 9
	0x0040000c	0x0c100007	jal max	5: jal max # call max proc...
	0x00400010	0x00000000	nop	6: nop
	0x00400014	0x2402000a	addiu \$2,\$0,10	7: li \$v0, 10 # terminate
	0x00400018	0x00000000	syscall	8: syscall
	0x0040001c	0x00010020	add \$2,\$0,20	17: max: add \$v0, \$a0, \$zero # copy (A0) in v...
	0x00400020	0x00a24002	sub \$t0,\$a1,\$v0	18: sub \$t0, \$a1, \$v0 # compute (a1 - v0)
	0x00400024	0x05000002	bne \$t0,\$zero	19: bne \$t0, \$zero # if (a1) - (v0)...
	0x00400028	0x00000000	nop	20: nop
	0x0040002c	0x00a01020	add \$2,\$0,20	21: add \$v0, \$a1, \$zero # else (a1) is i...

Labels

Label	Address
main	0x00400000
endmain	0x0040001c
max	0x0040001c
okay	0x00400020
done	0x0040002c

☒ Data ☒ Text

Data Segment

Address	Value (+0)	Value (+4)	Value (+8)	Value (+c)	Value (+10)	Value (+14)	Value (+18)	Value (+1c)
0x10010000	0	0	0	0	0	0	0	0
0x10010020	0	0	0	0	0	0	0	0
0x10010040	0	0	0	0	0	0	0	0
0x10010060	0	0	0	0	0	0	0	0
0x10010080	0	0	0	0	0	0	0	0
0x100100a0	0	0	0	0	0	0	0	0
0x100100c0	0	0	0	0	0	0	0	0
0x100100e0	0	0	0	0	0	0	0	0
0x10010100	0	0	0	0	0	0	0	0
0x10010120	0	0	0	0	0	0	0	0

Mars Messages Run I/O

Clear

-- program is finished running --

-- program is finished running --

Registers Coproc 1 Coproc 0

Name	Number	Value
\$zero	0	0
\$at	1	0
\$v0	2	2
\$v1	3	0
\$a0	4	2
\$a1	5	6
\$a2	6	9
\$a3	7	0
\$t0	8	4
\$t1	9	0
\$t2	10	0
\$t3	11	0
\$t4	12	0
\$t5	13	0
\$t6	14	0
\$t7	15	0
\$t8	16	0
\$t9	17	0
\$s0	18	0
\$s1	19	0
\$s2	20	0
\$s3	21	0
\$s4	22	0
\$s5	23	0
\$s6	24	0
\$s7	25	0
\$s8	26	0
\$s9	27	0
\$k0	28	0
\$k1	29	0
\$gp	30	268660224
\$ap	31	2147479540
\$fp	32	0
\$ra	33	4194320
\$pc	34	4194344
\$hi	35	0
\$lo	36	0

C:\Users\lmd\Desktop\Code\asm\week07\az2.asm - MARS 4.5

File Edit Run Settings Tools Help

Run speed at max (no interaction)

Edit Execute

Text Segment

Bkpt	Address	Code	Basic	Source
	0x00400004	0x24050006	addiu \$5,\$0,6	3: li \$a1, 6
	0x00400008	0x24060009	addiu \$6,\$0,9	4: li \$a2, 9
	0x0040000c	0x0c100007	jal 0x0040001c	5: jal max # call max proc...
	0x00400010	0x00000000	nop	6: nop
	0x00400014	0x2402000a	addiu \$2,\$0,10	7: li \$v0, 10 # terminate
	0x00400018	0x00000000	syscall	8: syscall
	0x0040001c	0x00801020	add \$v0,\$a0,\$zero	17: max: add \$v0, \$a0, \$zero # copy (a0) in v...
	0x00400020	0x00a24022	sub \$t0,\$a1,\$v0	18: sub \$t0, \$a1, \$v0 # compute (a1) - v...
	0x00400024	0x05000002	bltz \$t0,2	19: bltz \$t0, okay # if (a1) - (v0) < 0
	0x00400028	0x00000000	nop	20: nop
	0x0040002c	0x00a01020	add \$v0,\$a1,\$zero	21: add \$v0, \$a1, \$zero # else (a1) is 1...
	0x00400030	0x00c24022	sub \$t0,\$a2,\$v0	22: okay: sub \$t0, \$a2, \$v0 # compute (a2) - v...

Labels

Label	Address
main	0x00400000
endmain	0x0040001c
max	0x0040001c
okay	0x00400030
done	0x00400040

☒ Data ☒ Text

Data Segment

Address	Value (+0)	Value (+4)	Value (+8)	Value (+c)	Value (+10)	Value (+14)	Value (+18)	Value (+1c)
0x10010000	0	0	0	0	0	0	0	0
0x10010020	0	0	0	0	0	0	0	0
0x10010040	0	0	0	0	0	0	0	0
0x10010060	0	0	0	0	0	0	0	0
0x10010080	0	0	0	0	0	0	0	0
0x100100a0	0	0	0	0	0	0	0	0
0x100100c0	0	0	0	0	0	0	0	0
0x100100e0	0	0	0	0	0	0	0	0
0x10010100	0	0	0	0	0	0	0	0
0x10010120	0	0	0	0	0	0	0	0

0x10010000 (.data) ☒ Hexadecimal Addresses ☐ Hexadecimal Values ☐ ASCII

Mars Messages Run I/O

Clear

-- program is finished running --

-- program is finished running --

Registers Coproc 1 Coproc 0

Name	Number	Value
\$zero	0	0
\$at	1	0
\$v0	2	6
\$v1	3	0
\$a0	4	6
\$a1	5	6
\$a2	6	9
\$a3	7	0
\$t0	8	4
\$t1	9	0
\$t2	10	0
\$t3	11	0
\$t4	12	0
\$t5	13	0
\$t6	14	0
\$t7	15	0
\$s0	16	0
\$s1	17	0
\$s2	18	0
\$s3	19	0
\$s4	20	0
\$s5	21	0
\$s6	22	0
\$s7	23	0
\$s8	24	0
\$s9	25	0
\$k0	26	0
\$k1	27	0
\$gp	28	268460224
\$ap	29	2147479540
\$fp	30	
\$ra	31	4194320
pc		4194352
hi		0
lo		0

C:\Users\lmd\Desktop\Code\asm\week07\az2.asm - MARS 4.5

File Edit Run Settings Tools Help

Run speed at max (no interaction)

Edit Execute

Text Segment

Bkpt	Address	Code	Basic	Source
	0x00400008	0x24060009	addiu \$6,\$0,9	4: li \$a2, 9
	0x0040000c	0x0c100007	jal 0x0040001c	5: jal max # call max proc...
	0x00400010	0x00000000	nop	6: nop
	0x00400014	0x2402000a	addiu \$2,\$0,10	7: li \$v0, 10 # terminate
	0x00400018	0x00000000	syscall	8: syscall
	0x0040001c	0x00801020	add \$v0,\$a0,\$zero	17: max: add \$v0, \$a0, \$zero # copy (a0) in v...
	0x00400020	0x00a24022	sub \$t0,\$a1,\$v0	18: sub \$t0, \$a1, \$v0 # compute (a1) - v...
	0x00400024	0x05000002	bltz \$t0,2	19: bltz \$t0, okay # if (a1) - (v0) < 0
	0x00400028	0x00000000	nop	20: nop
	0x0040002c	0x00a01020	add \$v0,\$a1,\$zero	21: add \$v0, \$a1, \$zero # else (a1) is 1...
	0x00400030	0x00c24022	sub \$t0,\$a2,\$v0	22: okay: sub \$t0, \$a2, \$v0 # compute (a2) - v...
	0x00400034	0x05000002	bltz \$t0,2	23: bltz \$t0,done # if (a2) - (v0) < 0

Labels

Label	Address
main	0x00400000
endmain	0x0040001c
max	0x0040001c
okay	0x00400030
done	0x00400040

☒ Data ☒ Text

Data Segment

Address	Value (+0)	Value (+4)	Value (+8)	Value (+c)	Value (+10)	Value (+14)	Value (+18)	Value (+1c)
0x10010000	0	0	0	0	0	0	0	0
0x10010020	0	0	0	0	0	0	0	0
0x10010040	0	0	0	0	0	0	0	0
0x10010060	0	0	0	0	0	0	0	0
0x10010080	0	0	0	0	0	0	0	0
0x100100a0	0	0	0	0	0	0	0	0
0x100100c0	0	0	0	0	0	0	0	0
0x100100e0	0	0	0	0	0	0	0	0
0x10010100	0	0	0	0	0	0	0	0
0x10010120	0	0	0	0	0	0	0	0

0x10010000 (.data) ☒ Hexadecimal Addresses ☐ Hexadecimal Values ☐ ASCII

Mars Messages Run I/O

Clear

-- program is finished running --

-- program is finished running --

Registers Coproc 1 Coproc 0

Name	Number	Value
\$zero	0	0
\$at	1	0
\$v0	2	9
\$v1	3	0
\$a0	4	6
\$a1	5	6
\$a2	6	9
\$a3	7	0
\$t0	8	4
\$t1	9	0
\$t2	10	0
\$t3	11	0
\$t4	12	0
\$t5	13	0
\$t6	14	0
\$t7	15	0
\$s0	16	0
\$s1	17	0
\$s2	18	0
\$s3	19	0
\$s4	20	0
\$s5	21	0
\$s6	22	0
\$s7	23	0
\$s8	24	0
\$s9	25	0
\$k0	26	0
\$k1	27	0
\$gp	28	268460224
\$ap	29	2147479540
\$fp	30	
\$ra	31	4194320
pc		4194356
hi		0
lo		0

C:\Users\lmd\Desktop\Code\asm\week07\az.asm - MARS 4.5

File Edit Run Settings Tools Help

Run speed at max (no interaction)

Execute

Text Segment

Byte	Address	Code	Basic	Source
0x00400014	0x2402000a	addiu \$2,\$0,10	7:	li \$v0, 10 # terminate
0x00400018	0x0000000c	syscall	8:	syscall
0x0040001c	0x00010000	add \$2,\$4,\$0	17:	max: add \$v0, \$a0, \$zero # copy (a0) in v...
0x00400020	0x00240022	sub \$9,\$2,\$2	18:	sub \$v0, \$a1, \$v0 # compute (a1) - ...
0x00400024	0x00000002	bltz \$0,\$2	19:	bltz \$t0, okay # if (a1) - (v0) < 0
0x00400028	0x00000000	nop	20:	nop
0x0040002c	0x00a01020	add \$2,\$5,\$0	21:	add \$v0, \$a1, \$zero # else (a1) is 1...
0x00400030	0x00c24022	sub \$8,\$6,\$2	22:	okay: sub \$t0, \$a2, \$v0 # compute (a2) - ...
0x00400034	0x00000002	bltz \$9,\$2	23:	bltz \$t0, done # if (a2) - (v0) < 0
0x00400038	0x00000000	nop	24:	nop
0x0040003c	0x00c01020	add \$2,\$6,\$0	25:	add \$v0, \$a2, \$zero # else (a2) is 1...
0x00400040	0x03e00008	jr \$31	26:	done: jr \$ra # return to call...

Labels

Label	Address
a2.asm	
main	0x00400000
endmain	0x0040001c
max	0x00400017
okay	0x00400023
done	0x00400040

Registers

Name	Number	Value
\$zero	0	0
\$at	1	0
\$v0	2	6
\$v1	3	0
\$a0	4	0
\$a1	5	0
\$a2	6	0
\$a3	7	0
\$t0	8	0
\$t1	9	0
\$t2	10	0
\$t3	11	0
\$t4	12	0
\$t5	13	0
\$t6	14	0
\$t7	15	0
\$s0	16	0
\$s1	17	0
\$s2	18	0
\$s3	19	0
\$s4	20	0
\$s5	21	0
\$s6	22	0
\$s7	23	0
\$s8	24	0
\$s9	25	0
\$k0	26	0
\$k1	27	0
\$gp	28	268660224
\$ap	29	2147479540
\$fp	30	0
\$ra	31	4194320
\$pc		4194364
\$hi		0
\$lo		0

Mars Messages

Run I/O

Clear

-- program is finished running --

-- program is finished running --

C:\Users\lmd\Desktop\Code\asm\week07\az.asm - MARS 4.5

File Edit Run Settings Tools Help

Run speed at max (no interaction)

Execute

Text Segment

Byte	Address	Code	Basic	Source
0x00400014	0x2402000a	addiu \$2,\$0,10	7:	li \$v0, 10 # terminate
0x00400018	0x0000000c	syscall	8:	syscall
0x0040001c	0x00010000	add \$2,\$4,\$0	17:	max: add \$v0, \$a0, \$zero # copy (a0) in v...
0x00400020	0x00240022	sub \$9,\$2,\$2	18:	sub \$v0, \$a1, \$v0 # compute (a1) - ...
0x00400024	0x00000002	bltz \$0,\$2	19:	bltz \$t0, okay # if (a1) - (v0) < 0
0x00400028	0x00000000	nop	20:	nop
0x0040002c	0x00a01020	add \$2,\$5,\$0	21:	add \$v0, \$a1, \$zero # else (a1) is 1...
0x00400030	0x00c24022	sub \$8,\$6,\$2	22:	okay: sub \$t0, \$a2, \$v0 # compute (a2) - ...
0x00400034	0x00000002	bltz \$9,\$2	23:	bltz \$t0, done # if (a2) - (v0) < 0
0x00400038	0x00000000	nop	24:	nop
0x0040003c	0x00c01020	add \$2,\$6,\$0	25:	add \$v0, \$a2, \$zero # else (a2) is 1...
0x00400040	0x03e00008	jr \$31	26:	done: jr \$ra # return to call...

Labels

Label	Address
a2.asm	
main	0x00400000
endmain	0x0040001c
max	0x00400017
okay	0x00400023
done	0x00400040

Registers

Name	Number	Value
\$zero	0	0
\$at	1	0
\$v0	2	6
\$v1	3	0
\$a0	4	0
\$a1	5	0
\$a2	6	0
\$a3	7	0
\$t0	8	0
\$t1	9	0
\$t2	10	0
\$t3	11	0
\$t4	12	0
\$t5	13	0
\$t6	14	0
\$t7	15	0
\$s0	16	0
\$s1	17	0
\$s2	18	0
\$s3	19	0
\$s4	20	0
\$s5	21	0
\$s6	22	0
\$s7	23	0
\$s8	24	0
\$s9	25	0
\$k0	26	0
\$k1	27	0
\$gp	28	268660224
\$ap	29	2147479540
\$fp	30	0
\$ra	31	4194320
\$pc		4194364
\$hi		0
\$lo		0

Mars Messages

Run I/O

Clear

-- program is finished running --

-- program is finished running --

C:\Users\lmd\Desktop\Code\asm\week07\asm - MARS 4.5

File Edit Run Settings Tools Help

Run speed at max (no interaction)

Edit Execute

Text Segment

Bkpt	Address	Code	Basic	Source
	0x00400010	0x00000000	nop	6: nop
	0x00400014	0x2102000a	addiu \$2,\$0,10	7: li \$v0, 10 # terminate
	0x00400018	0x00000000	syscall	8: syscall
	0x0040001c	0x00001020	add \$v0,\$a0,\$zero	17: max: add \$v0,\$a0,\$zero # copy \$a0 in r...
	0x00400020	0x00a24032	sub \$t0,\$a1,\$v0	18: sub \$t0,\$a1,\$v0 # compute \$a1 - v0...
	0x00400024	0x50000002	bne \$t0,\$zero	19: bne \$t0,\$zero # if \$a1 - v0...
	0x00400028	0x00000000	nop	20: nop
	0x0040002c	0x00c01020	add \$v0,\$a1,\$zero	21: add \$v0,\$a1,\$zero # else \$a1 is 1...
	0x00400030	0x00024032	sub \$t0,\$a2,\$v0	22: okay: sub \$t0,\$a2,\$v0 # compute \$a2 - v0...
	0x00400034	0x50000002	bne \$t0,\$zero	23: bne \$t0,\$zero # if \$a2 - v0...
	0x00400038	0x00000000	nop	24: nop
	0x0040003c	0x00c01020	add \$v0,\$a2,\$zero	25: add \$v0,\$a2,\$zero # else \$a2 is 1...

Labels

Label	Address
a2.asm	0x00400000
main	0x00400000
endmain	0x0040001c
max	0x0040001c
okay	0x00400030
done	0x0040003c

☒ Data ☒ Text

Data Segment

Address	Value (+0)	Value (+4)	Value (+8)	Value (+c)	Value (+10)	Value (+14)	Value (+18)	Value (+1c)
0x10010000	0	0	0	0	0	0	0	0
0x10010004	0	0	0	0	0	0	0	0
0x10010008	0	0	0	0	0	0	0	0
0x1001000c	0	0	0	0	0	0	0	0
0x10010010	0	0	0	0	0	0	0	0
0x10010014	0	0	0	0	0	0	0	0
0x10010018	0	0	0	0	0	0	0	0
0x1001001c	0	0	0	0	0	0	0	0
0x10010020	0	0	0	0	0	0	0	0

☒ Hexadecimal Addresses ☐ Hexadecimal Values ☐ ASCII

Mars Messages Run I/O

Clear

-- program is finished running --

-- program is finished running --

Registers Coproc 1 Coproc 0

Name	Number	Value
\$zero	0	0
\$at	1	0
\$v0	2	10
\$v1	3	0
\$a0	4	0
\$a1	5	0
\$a2	6	0
\$a3	7	0
\$t0	8	0
\$t1	9	0
\$t2	10	0
\$t3	11	0
\$t4	12	0
\$t5	13	0
\$t6	14	0
\$t7	15	0
\$s0	16	0
\$s1	17	0
\$s2	18	0
\$s3	19	0
\$s4	20	0
\$s5	21	0
\$s6	22	0
\$s7	23	0
\$s8	24	0
\$s9	25	0
\$k0	26	0
\$k1	27	0
\$gp	28	268460224
\$ap	29	2147479540
\$fp	30	0
\$ra	31	4194320
\$pc		4194320
\$hi		0
\$lo		0

Assignment 3

Results:

C:\Users\lmd\Desktop\Code\asm\week07\asm - MARS 4.5

File Edit Run Settings Tools Help

Run speed at max (no interaction)

Edit Execute

Text Segment

Bkpt	Address	Code	Basic	Source
	0x00400000	0x23b0ffff	addi \$29,\$29,-8	2: pushi addi \$29,\$29,-8 # adjust...
	0x00400004	0x0fb00004	sw \$a0,4(\$29)	3: sw \$a0,4(\$29) # push \$...
	0x00400008	0x0fb00008	sw \$a1,0(\$29)	4: sw \$a1,0(\$29) # push \$...
	0x0040000c	0x00000000	nop	5: work: nop
	0x00400010	0x00000000	nop	6: nop
	0x00400014	0x00000000	nop	7: nop
	0x00400018	0x0fb00000	lw \$a0,0(\$29)	8: pop: lw \$a0,0(\$29) # pop fr...
	0x0040001c	0x0fb00004	lw \$a1,4(\$29)	9: lw \$a1,4(\$29) # pop fr...
	0x00400020	0x23b00008	addi \$29,\$29,8	10: addi \$29,\$29,8

Labels

Label	Address
a3.asm	0x00400000
push	0x00400000
work	0x0040000c
pop	0x00400018

☒ Data ☒ Text

Data Segment

Address	Value (+0)	Value (+4)	Value (+8)	Value (+c)	Value (+10)	Value (+14)	Value (+18)	Value (+1c)
0x10010000	0	0	0	0	0	0	0	0
0x10010004	0	0	0	0	0	0	0	0
0x10010008	0	0	0	0	0	0	0	0
0x1001000c	0	0	0	0	0	0	0	0
0x10010010	0	0	0	0	0	0	0	0
0x10010014	0	0	0	0	0	0	0	0
0x10010018	0	0	0	0	0	0	0	0
0x1001001c	0	0	0	0	0	0	0	0
0x10010020	0	0	0	0	0	0	0	0

☒ Hexadecimal Addresses ☐ Hexadecimal Values ☐ ASCII

Mars Messages Run I/O

Clear

step: execution completed successfully.

Assemble: assembling C:\Users\lmd\Desktop\Code\asm\week07\asm

Assemble: operation completed successfully.

Registers Coproc 1 Coproc 0

Name	Number	Value
\$zero	0	0
\$at	1	0
\$v0	2	0
\$v1	3	0
\$a0	4	0
\$a1	5	0
\$a2	6	0
\$a3	7	0
\$t0	8	0
\$t1	9	0
\$t2	10	0
\$t3	11	0
\$t4	12	0
\$t5	13	0
\$t6	14	0
\$t7	15	0
\$s0	16	0
\$s1	17	0
\$s2	18	0
\$s3	19	0
\$s4	20	0
\$s5	21	0
\$s6	22	0
\$s7	23	0
\$s8	24	0
\$s9	25	0
\$k0	26	0
\$k1	27	0
\$gp	28	268460224
\$ap	29	2147479540
\$fp	30	0
\$ra	31	0
\$pc		4194304
\$hi		0
\$lo		0

C:\Users\lmd\Desktop\Code\asm\week07\03.asm - MARS 4.5

File Edit Run Settings Tools Help

Run speed at max (no interaction)

Text Segment

Bkpt	Address	Code	Basic	Source
	0x00400000	0x23bdfef0	addi \$29,\$29,0xffff...	2: pushl addi \$ap, \$ap, -8 # adjust...
	0x00400004	0xafe00004	sw \$16,0x00000004(\$...	3: sw \$a0, 4(\$ap) # push \$...
	0x00400008	0xafe00000	sw \$17,0x00000000(\$...	4: sw \$a1, 0(\$ap) # push \$...
	0x0040000c	0x00000000	nop	5: works: nop
	0x00400010	0x00000000	nop	6: nop
	0x00400014	0x00000000	nop	7: nop
	0x00400018	0xafe00000	lw \$16,0x00000000(\$...	8: popl: lw \$a0, 0(\$ap) # pop fr...
	0x0040001c	0xafe00004	lw \$17,0x00000004(\$...	9: lw \$a1, 4(\$ap) # pop fr...
	0x00400020	0x23bd0008	addi \$29,\$29,0x0000...	addi \$ap, \$ap, 8

Labels

Label	Address
a3.asm	
push	0x00400000
work	0x0040000c
pop	0x00400018

Registers

Name	Number	Value
\$zero	0	0x00000000
\$at	1	0x00000000
\$v0	2	0x00000000
\$v1	3	0x00000000
\$a0	4	0x00000000
\$a1	5	0x00000000
\$a2	6	0x00000000
\$a3	7	0x00000000
\$t0	8	0x00000000
\$t1	9	0x00000000
\$t2	10	0x00000000
\$t3	11	0x00000000
\$t4	12	0x00000000
\$t5	13	0x00000000
\$t6	14	0x00000000
\$t7	15	0x00000000
\$s0	16	0x00000000
\$s1	17	0x00000000
\$s2	18	0x00000000
\$s3	19	0x00000000
\$s4	20	0x00000000
\$s5	21	0x00000000
\$s6	22	0x00000000
\$s7	23	0x00000000
\$s8	24	0x00000000
\$s9	25	0x00000000
\$k1	26	0x00000000
\$k2	27	0x00000000
\$gp	28	0x10000000
\$sp	29	0x7ffffef0
\$fp	30	0x00000000
\$ra	31	0x00000000
\$pc		0x00400024
\$hi		0x00000000
\$lo		0x00000000

Mars Messages

Run I/O

Clear

-- program is finished running --

-- program is finished running --

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File Edit Run Settings Tools Help

Run speed at max (no interaction)

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\$a1	5	0x00000000
\$a2	6	0x00000000
\$a3	7	0x00000000
\$t0	8	0x00000000
\$t1	9	0x00000000
\$t2	10	0x00000000
\$t3	11	0x00000000
\$t4	12	0x00000000
\$t5	13	0x00000000
\$t6	14	0x00000000
\$t7	15	0x00000000
\$s0	16	0x00000000
\$s1	17	0x00000000
\$s2	18	0x00000000
\$s3	19	0x00000000
\$s4	20	0x00000000
\$s5	21	0x00000000
\$s6	22	0x00000000
\$s7	23	0x00000000
\$s8	24	0x00000000
\$s9	25	0x00000000
\$k1	26	0x00000000
\$k2	27	0x00000000
\$gp	28	0x10000000
\$sp	29	0x7ffffef0
\$fp	30	0x00000000
\$ra	31	0x00000000
\$pc		0x00400024
\$hi		0x00000000
\$lo		0x00000000

Mars Messages

Run I/O

Clear

-- program is finished running --

-- program is finished running --

C:\Users\lmd\Desktop\Code\asm\week07\03.asm - MARS 4.5

File Edit Run Settings Tools Help

Run speed at max (no interaction)

Registers Coproc 1 Coproc 0

Name	Number	Value
\$zero	0	0x00000000
\$at	1	0x00000000
\$v0	2	0x00000000
\$v1	3	0x00000000
\$a0	4	0x00000000
\$a1	5	0x00000000
\$a2	6	0x00000000
\$a3	7	0x00000000
\$t0	8	0x00000000
\$t1	9	0x00000000
\$t2	10	0x00000000
\$t3	11	0x00000000
\$t4	12	0x00000000
\$t5	13	0x00000000
\$t6	14	0x00000000
\$t7	15	0x00000000
\$s0	16	0x00000000
\$s1	17	0x00000000
\$s2	18	0x00000000
\$s3	19	0x00000000
\$s4	20	0x00000000
\$s5	21	0x00000000
\$s6	22	0x00000000
\$s7	23	0x00000000
\$s8	24	0x00000000
\$s9	25	0x00000000
\$k1	26	0x00000000
\$k2	27	0x00000000
\$gp	28	0x10000000
\$sp	29	0x7ffffef4
\$fp	30	0x00000000
\$ra	31	0x00000000
\$pc		0x00400018
\$hi		0x00000000
\$lo		0x00000000

Text Segment

Offset	Address	Code	Basic	Source
0x00400000	0x23bdfef0	addi \$29,\$29,0xffff...	2: pushl	addi \$sp, \$sp, -8
0x00400004	0xaff00004	sw \$16,0x00000004(\$...	3:	sw \$a0, 4(\$sp)
0x00400008	0xaff00008	sw \$17,0x00000008(\$...	4:	sw \$a1, 8(\$sp)
0x0040000c	0x00000000	nop	5: work:	nop
0x00400010	0x00000000	nop	6:	nop
0x00400014	0x00000000	nop	7:	nop
0x00400018	0xaff00000	lw \$16,0x00000000(\$...	8: pop:	lw \$a0, 0(\$sp)
0x0040001c	0xaff00004	lw \$17,0x00000004(\$...	9:	lw \$a1, 4(\$sp)
0x00400020	0x23bdfef0	addi \$29,\$29,0x0000...	10:	addi \$sp, \$sp, 8

Data Segment

Address	Value (+0)	Value (+4)	Value (+8)	Value (+c)	Value (+10)	Value (+14)	Value (+18)	Value (+1c)
0x7ffffef0	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000
0x7ffffef4	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000
0x7ffffef8	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000
0x7ffffefc	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000
0x7fffff00	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000
0x7fffff04	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000
0x7fffff08	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000
0x7fffff0c	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000
0x7fffff10	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000

Mars Messages Run I/O

Clear

-- program is finished running --

-- program is finished running --

C:\Users\lmd\Desktop\Code\asm\week07\03.asm - MARS 4.5

File Edit Run Settings Tools Help

Run speed at max (no interaction)

Registers Coproc 1 Coproc 0

Name	Number	Value
\$zero	0	0x00000000
\$at	1	0x00000000
\$v0	2	0x00000000
\$v1	3	0x00000000
\$a0	4	0x00000000
\$a1	5	0x00000000
\$a2	6	0x00000000
\$a3	7	0x00000000
\$t0	8	0x00000000
\$t1	9	0x00000000
\$t2	10	0x00000000
\$t3	11	0x00000000
\$t4	12	0x00000000
\$t5	13	0x00000000
\$t6	14	0x00000000
\$t7	15	0x00000000
\$s0	16	0x00000000
\$s1	17	0x00000000
\$s2	18	0x00000000
\$s3	19	0x00000000
\$s4	20	0x00000000
\$s5	21	0x00000000
\$s6	22	0x00000000
\$s7	23	0x00000000
\$s8	24	0x00000000
\$s9	25	0x00000000
\$k1	26	0x00000000
\$k2	27	0x00000000
\$gp	28	0x10000000
\$sp	29	0x7ffffef4
\$fp	30	0x00000000
\$ra	31	0x00000000
\$pc		0x00400018
\$hi		0x00000000
\$lo		0x00000000

Text Segment

Offset	Address	Code	Basic	Source
0x00400000	0x23bdfef0	addi \$29,\$29,0xffff...	2: pushl	addi \$sp, \$sp, -8
0x00400004	0xaff00004	sw \$16,0x00000004(\$...	3:	sw \$a0, 4(\$sp)
0x00400008	0xaff00008	sw \$17,0x00000008(\$...	4:	sw \$a1, 8(\$sp)
0x0040000c	0x00000000	nop	5: work:	nop
0x00400010	0x00000000	nop	6:	nop
0x00400014	0x00000000	nop	7:	nop
0x00400018	0xaff00000	lw \$16,0x00000000(\$...	8: pop:	lw \$a0, 0(\$sp)
0x0040001c	0xaff00004	lw \$17,0x00000004(\$...	9:	lw \$a1, 4(\$sp)
0x00400020	0x23bdfef0	addi \$29,\$29,0x0000...	10:	addi \$sp, \$sp, 8

Data Segment

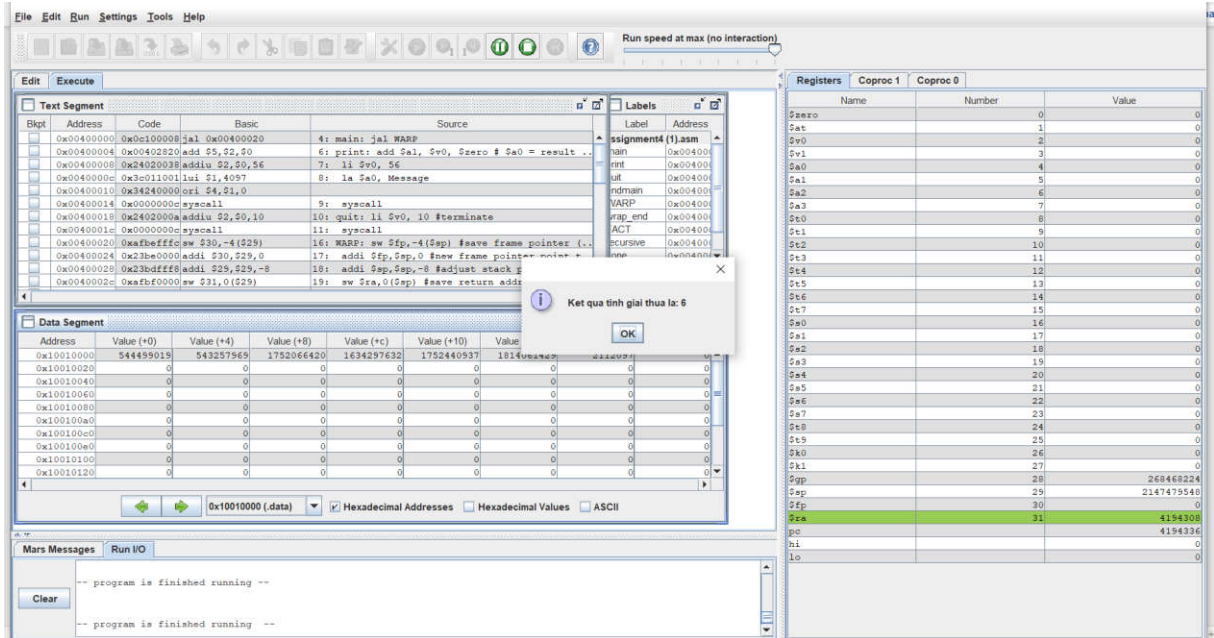
Address	Value (+0)	Value (+4)	Value (+8)	Value (+c)	Value (+10)	Value (+14)	Value (+18)	Value (+1c)
0x7ffffef0	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000
0x7ffffef4	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000
0x7ffffef8	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000
0x7ffffefc	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000
0x7fffff00	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000
0x7fffff04	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000
0x7fffff08	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000
0x7fffff0c	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000
0x7fffff10	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000	0x00000000

Mars Messages Run I/O

Clear

-- program is finished running --

-- program is finished running --



- Giải thích từng bước :
- Chương trình đầu tiên nhảy vào procedure, tạo stack lưu vào thanh ghi `$p` chứa các giá trị
- Thêm giá trị của `n=3` vào thanh ghi `a0`, tạo bộ nhớ cho thanh ghi địa chỉ
- Lưu các giá trị 2 vào thanh ghi `a0`, lúc này giá trị ba được lưu trong địa chỉ sau, bên phải là địa chỉ trả về

Address	Value (+0)	Value (+4)	Value (+8)	Value (+c)	Value (+10)	Value (+14)	Value (+18)	Value (+1c)
0x7ffffe0	0	0	3	4194360	2147479548	4194308	0	0
0x7ffff000	0	0	0	0	0	0	0	0
0x7ffff020	0	0	0	0	0	0	0	0
0x7ffff040	0	0	0	0	0	0	0	0
0x7ffff060	0	0	0	0	0	0	0	0
0x7ffff080	0	0	0	0	0	0	0	0
0x7ffff0a0	0	0	0	0	0	0	0	0
0x7ffff0c0	0	0	0	0	0	0	0	0
0x7ffff0e0	0	0	0	0	0	0	0	0
0x7ffff100	0	0	0	0	0	0	0	0

Tương tự ta có :

Data Segment								
Address	Value (+0)	Value (+4)	Value (+8)	Value (+c)	Value (+10)	Value (+14)	Value (+18)	Value (+1c)
0x7ffffefc0	0	0	0	0	1	4194432	2147479528	2
0x7ffffefe0	4194432	2147479540	3	4194360	2147479548	4194308	0	0
0x7fffff000	0	0	0	0	0	0	0	0
0x7fffff020	0	0	0	0	0	0	0	0
0x7fffff040	0	0	0	0	0	0	0	0
0x7fffff060	0	0	0	0	0	0	0	0
0x7fffff080	0	0	0	0	0	0	0	0
0x7fffff0a0	0	0	0	0	0	0	0	0
0x7fffff0c0	0	0	0	0	0	0	0	0
0x7fffff0e0	0	0	0	0	0	0	0	0

current \$sp
☒ Hexadecimal Addresses
☐ Hexadecimal Values
☐ ASCII

- 3 ô cạnh nhau lần lượt lưu giá trị thanh ghi a0 , địa chỉ trả về, địa chỉ fp sau mỗi vòng lặp
- Sau đó lưu lần lượt 2 giá trị cạnh nhau vào thanh ghi v0 ,v1, thực hiện phép nhân lưu vào thanh ghi lo

Name	Number	Value
\$zero	0	0
\$at	1	0
\$v0	2	1
\$v1	3	2
\$a0	4	1
\$a1	5	0
\$a2	6	0
\$a3	7	0
\$t0	8	1
\$t1	9	0
\$t2	10	0
\$t3	11	0
\$t4	12	0
\$t5	13	0
\$t6	14	0
\$t7	15	0
\$s0	16	0
\$s1	17	0
\$s2	18	0
\$s3	19	0
\$s4	20	0
\$s5	21	0
\$s6	22	0
\$s7	23	0
\$t8	24	0
\$t9	25	0
\$k0	26	0
\$k1	27	0
\$gp	28	268468224
\$sp	29	2147479516
\$fp	30	2147479528
\$ra	31	4194432
pc		4194444
hi		0
lo		2

Tiến hành lưu lại giá trị thanh ghi lo vào thanh ghi v0, cập nhập giá trị tiếp

theo cần nhân vào thanh ghi v1, rồi tiến hành như trên đến khi giá trị v1 bằng n (với ở đây là bằng 3). Lúc này thì in ra giá trị.

Name	Number	Value
\$zero	0	0
\$at	1	0
\$v0	2	6
\$v1	3	3
\$a0	4	3
\$a1	5	6
\$a2	6	0
\$a3	7	0
\$t0	8	1
\$t1	9	0
\$t2	10	0
\$t3	11	0
\$t4	12	0
\$t5	13	0
\$t6	14	0
\$t7	15	0
\$s0	16	0
\$s1	17	0
\$s2	18	0
\$s3	19	0
\$s4	20	0
\$s5	21	0
\$s6	22	0
\$s7	23	0
\$t8	24	0
\$t9	25	0
\$k0	26	0
\$k1	27	0
\$gp	28	268468224
\$sp	29	2147479548
\$fp	30	0
\$ra	31	4194308
pc		4194312
hi		0
lo		6

Kết thúc chương trình

Assignment 5

Code:

```
.data
```

```
Greatest: .ascii "Greatest: "
```

Smallest: .asciiz "Smallest: "

Location: .asciiz ", Register: "

.text

mainInit: li \$s0, 8

li \$s1, 7

li \$s2, 6

li \$s3, 5

li \$s4, 4

li \$s5, 3

li \$s6, 2

li \$s7, 9

push: addi \$sp, \$sp, -32 # adjust the stack pointer

sw \$s0, 28(\$sp) # push \$s0 to stack

sw \$s1, 24(\$sp) # push \$s1 to stack

sw \$s2, 20(\$sp) # push \$s2 to stack

sw \$s3, 16(\$sp) # push \$s3 to stack

sw \$s4, 12(\$sp) # push \$s4 to stack

sw \$s5, 08(\$sp) # push \$s5 to stack

sw \$s6, 04(\$sp) # push \$s6 to stack

sw \$s7, 00(\$sp) # push \$s7 to stack

loopInit: li \$s0, -100000 # s0 stores the greatest value

li \$s1, -1 # s1 stores the location of the
greatest value

li \$s2, +100000 # s2 stores the smallest value

li \$s3, -1 # s3 stores the location of the
smallest value

li \$s4, 7 # current index of the stack's top

loop: beq \$sp, 0x7ffffeffc, endLoop # while stack isn't empty

lw \$t0, 00(\$sp) # get the top of the stack

blt \$s0, \$t0, update1

```

afterU1:    bgt $s2, $t0, update2
afterU2     addi $sp, $sp, +4           # pop the top of the stack
           addi $s4, $s4, -1          # update the top's index
           j loop
update1:    add $s0, $zero, $t0        # update greatest
           add $s1, $zero, $s4
           j afterU1
update2:    add $s2, $zero, $t0        # update smallest
           add $s3, $zero, $s4
           j afterU2
endLoop:
printGreatest:  li $v0, 4
                la $a0, Greatest
                syscall
                li $v0, 1
                add $a0, $zero, $s0
                syscall
                li $v0, 4
                la $a0, Location
                syscall
                li $v0, 1
                add $a0, $zero, $s1
                syscall
                li $v0, 11
                li $a0, '\n'
                syscall
printSmallest:  li $v0, 4
                la $a0, Smallest
                syscall
                li $v0, 1

```



```

add $a0, $zero, $s2
syscall
li $v0, 4
la $a0, Location
syscall
li $v0, 1
add $a0, $zero, $s3
syscall
li $v0, 11
li $a0, '\n'
syscall

```

Comments:

- The idea is to create a stack to store the values of 8 registers and using pop() to traverse through them quickly.
- By using the stack to loop, we don't have to write 8 separate IF statements to update the largest and the greatest register.
- By pushing registers' values to stack, we can reuse registers to store the final results.

Results:

- The sample list in the code was [8, 7, 6, 5, 4, 3, 2, 9].
- The greatest value was 9, in \$s7.
- The smallest value was 2, in \$s6.

<div>Clear</div>	<pre> Greatest: 9, Register: 7 Smallest: 2, Register: 6 -- program is finished running (dropped </pre>