/home/protik/Desktop/Computer-Architecture-Homeworks/vector_multiplication.asm - MARS 4.5
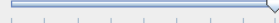
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Run speed at max (no interaction)

Edit | Execute

vector_multiplication.asm

```
 1    .data
 2
 3    vector_a:     .word 15, 4, 19, 5, 2, 3, 4, 5
 4    vector_b:     .word 4, 11, 8, 4, 1, 0, 6, 8
 5    n:            .word 8
 6
 7    .text
 8
 9    main:
10        # Load the address of vector_a, vector_b, and n into registers
11        la $s0, vector_a
12        la $s1, vector_b
13        lw $t0, n
14
15        # Initialize variables for dot product and loop counter
16        li $t1, 0    # Dot product sum
17        li $t2, 0    # Loop counter
18        li $t3, 0    # Offset value
19
20    outer_loop:
21        # Load elements a[i] and b[i]
22        lw $s2, 0($s0)  # Load a[i] into $s2
23        lw $s3, 0($s1)  # Load b[i] into $s3
24        li $s4, 0       # multiplication (sum) accumulator
25
26    multiply_loop:
27        # implement multiplication using add
28        beq $s3, 0, end_multiply_loop        # stop the loop whenever s3 = 0
29
30        add $s4, $s4, $s2                     # we continue adding s2 to itself
31        subi $s3, $s3, 1                      # continue subtracting 1 from s3
32
33        j multiply_loop
34
35    end_multiply_loop:
36        # update dot product sum
37        add $t1, $t1, $s4
38
39        # Update loop counter and pointers
40        addi $t2, $t2, 1    # Increment loop counter
41        addi $s0, $s0, 4    # Move to the next element in vector a
```

Line: 5 Column: 20 ☑ Show Line Numbers

Registers	Coproc 1	Coproc 0

Name	Number	Value
$zero	0	0x00000000
$at	1	0x00000000
$v0	2	0x0000000a
$v1	3	0x00000000
$a0	4	0x00000156
$a1	5	0x00000000
$a2	6	0x00000000
$a3	7	0x00000000
$t0	8	0x00000008
$t1	9	0x00000156
$t2	10	0x00000008
$t3	11	0x00000000
$t4	12	0x00000000
$t5	13	0x00000000
$t6	14	0x00000000
$t7	15	0x00000000
$s0	16	0x10010020
$s1	17	0x10010040
$s2	18	0x00000005
$s3	19	0x00000000
$s4	20	0x00000028
$s5	21	0x00000000
$s6	22	0x00000000
$s7	23	0x00000000
$t8	24	0x00000000
$t9	25	0x00000000
$k0	26	0x00000000
$k1	27	0x00000000
$gp	28	0x10008000
$sp	29	0x7fffeffc
$fp	30	0x00000000
$ra	31	0x00000000
pc		0x00400070
hi		0x00000000
lo		0x00000000

Mars Messages | Run I/O

```
814
-- program is finished running --

5984
-- program is finished running --

342
-- program is finished running --
```

Clear