Project P4-3 (MIPS assembly program)

Computer Organization and Architecture

IF-45-INT

By;

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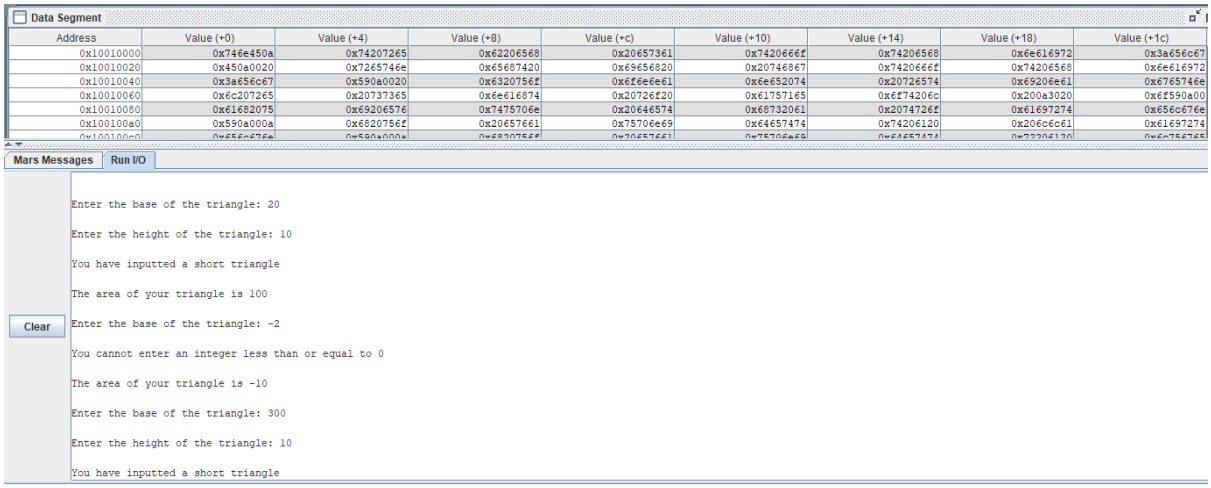
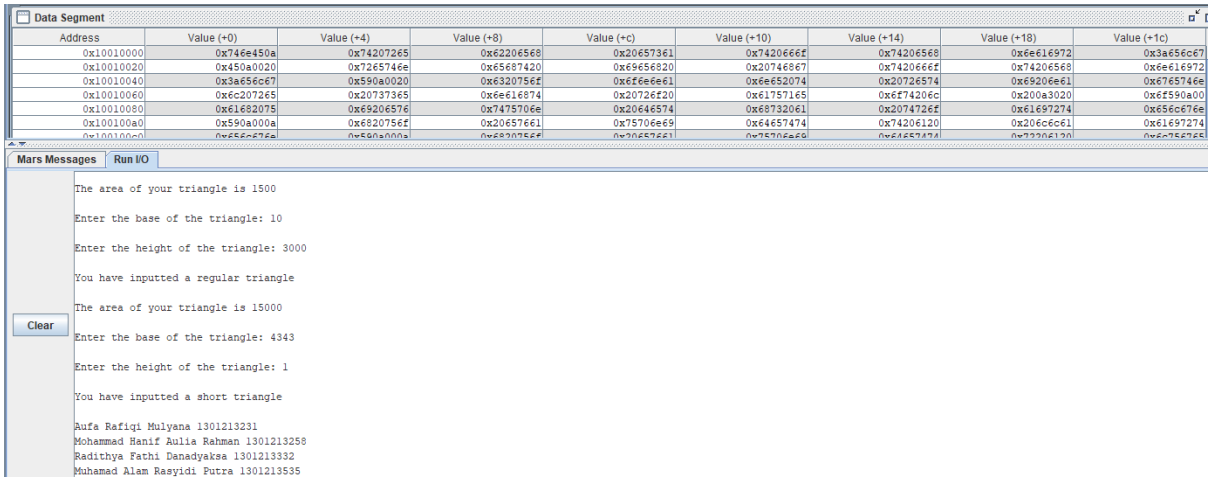
Source Code Program

```
.data
	# Data in RAM that has't been assigned to.
	prompt_base: .asciiz "\nEnter the base of the triangle: "
	prompt_height: .asciiz "\nEnter the height of the triangle: "
	prompt_lessthan: .asciiz "\nYou cannot enter an integer less than or equal to 0\n "
	prompt_shorttri: .asciiz "\nYou have inputted a short triangle\n"
	prompt_talltri: .asciiz "\nYou have inputted a tall triangle\n"
	prompt_regtri: .asciiz "\nYou have inputted a regular triangle\n"
	prompt_triarea: .asciiz "\nThe area of your triangle is "
	prompt_group: .asciiz "\nAufa Rafiqi Mulyana 1301213231\nMohammad Hanif Aulia Rahman 1301213258\nRadithya Fathi Danadyaksa 1301213332\nMuhamad Alam Rasyidi Putra 1301213535"
	NewLine: .asciiz "\n"
.text
	main :

		while:
		#Call the fuction input
		jal input
		#the contdition to terminate the while loop
		beq $s0, 4343, exit
		beq $s1, 4343, exit
		#Call the fuction input
		jal Calculation
		#Call the fuction input
		jal display
		#To make it while
		j while

		exit:
		#Print group members
		li $v0, 4
		la $a0, prompt_group
		syscall
		#End of Program
		li $v0, 10
		syscall
	input:
		# Ask the user for the base of the triangle
		li $v0, 4
		la $a0, prompt_base
		syscall
		# Input the integer and assign it to $s0
		li $v0, 5
		syscall
		move $s0, $v0
		# Check if the input is less than or equal to zero
		bltz $s0, lessthaninput

			# Ask the user for the height of the triangle
			li $v0, 4
			la $a0, prompt_height
			syscall
			# Input the integer and assign it to $s1
			li $v0, 5
			syscall
			move $s1, $v0
			# Check if the input is less than or equal to zero
			bltz $s1, lessthaninput
			#Add condition to decide what kind of triangle
			add $t1, $s1, $s1
			sub $t2, $s0, $s1
			blt $t2, 2, reg_tree
			bge $s0, $t1, short_tree
			ble $s0, $t1, tall_tree
			jr $ra
			#End of Program
			li $v0, 10
			syscall

	Calculation:
	`	# Calculate the area by timing the base and height and assigning it to $t3 and dividing it by 2
			mult $s0,$s1
			mflo $t3
			div $t4, $t3, 2
			jr $ra

	display:
			#Function to show the area of the triangle
			li,$v0, 4
			la $a0, prompt_triarea
			syscall
			li $v0,1
			move $a0, $t4
			syscall
			li $v0, 4
			la $a0, NewLine
			syscall


			jr $ra
```

```
92          lessthaninput:
93                  #function to return to the main program if the inputted data is less than 0
94                  li $v0, 4
95                  la $a0, prompt_lessthan
96                  syscall
97
98                  jr $ra
99
100         #the functions below are for printing what kind of triangle
101         short_tree:
102                 li $v0, 4
103                 la $a0, prompt_shorttri
104                 syscall
105
106                 jr $ra
107
108         tall_tree:
109                 li $v0, 4
110                 la $a0, prompt_talltri
111                 syscall
112
113                 jr $ra
114
115         reg_tree:
116                 li $v0, 4
117                 la $a0, prompt_regtri
118                 syscall
119
120                 jr $ra
```

Execution


Data Segment
Address Value (+0) Value (+4) Value (+8) Value (+c) Value (+10) Value (+14) Value (+18) Value (+1c)
0x10010000 0x746e450a 0x74207265 0x62206568 0x20657361 0x7420666f 0x74206568 0x6e616972 0x3a656c67
0x10010020 0x450a0020 0x7265746e 0x65687420 0x69656820 0x20746867 0x7420666f 0x74206568 0x6e616972
0x10010040 0x3a656c67 0x590a0020 0x6320756f 0x6f6e6e61 0x6e652074 0x20726574 0x69206e61 0x6765746e
0x10010060 0x6c207265 0x20737365 0x6e616874 0x20726f20 0x61757165 0x6f74206c 0x200a3020 0x6f590a00
0x10010080 0x61682075 0x69206576 0x7475706e 0x20646574 0x68732061 0x2074726f 0x61697274 0x656c676e
0x100100a0 0x590a000a 0x6820756f 0x20657661 0x75706e69 0x64657474 0x74206120 0x206c6c61 0x61697274
Mars Messages
Run I/O
Clear
Enter the base of the triangle: 20
Enter the height of the triangle: 10
You have inputted a short triangle
The area of your triangle is 100
Enter the base of the triangle: -2
You cannot enter an integer less than or equal to 0
The area of your triangle is -10
Enter the base of the triangle: 300
Enter the height of the triangle: 10
You have inputted a short triangle


Data Segment
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0x10010020 0x450a0020 0x7265746e 0x65687420 0x69656820 0x20746867 0x7420666f 0x74206568 0x6e616972
0x10010040 0x3a656c67 0x590a0020 0x6320756f 0x6f6e6e61 0x6e652074 0x20726574 0x69206e61 0x6765746e
0x10010060 0x6c207265 0x20737365 0x6e616874 0x20726f20 0x61757165 0x6f74206c 0x200a3020 0x6f590a00
0x10010080 0x61682075 0x69206576 0x7475706e 0x20646574 0x68732061 0x2074726f 0x61697274 0x656c676e
0x100100a0 0x590a000a 0x6820756f 0x20657661 0x75706e69 0x64657474 0x74206120 0x206c6c61 0x61697274
Mars Messages
Run I/O
Clear
The area of your triangle is 1500
Enter the base of the triangle: 10
Enter the height of the triangle: 3000
You have inputted a regular triangle
The area of your triangle is 15000
Enter the base of the triangle: 4343
Enter the height of the triangle: 1
You have inputted a short triangle
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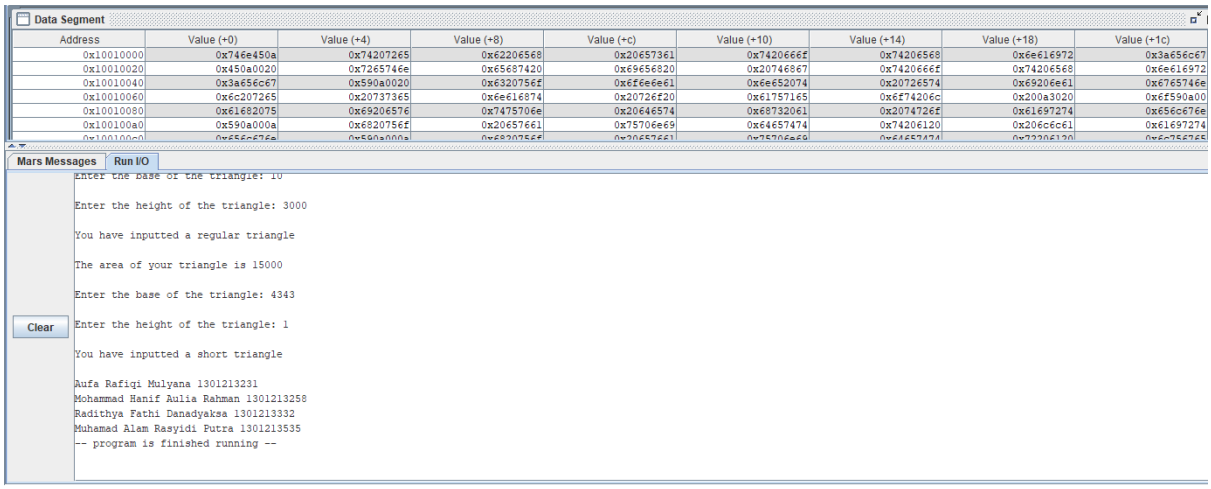
Data Segment
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0x10010000 0x746e450a 0x74207265 0x62206568 0x20657361 0x7420666f 0x74206568 0x6e616972 0x3a656c67
0x10010020 0x450a0020 0x7265746e 0x65687420 0x69656820 0x20746867 0x7420666f 0x74206568 0x6e616972
0x10010040 0x3a656c67 0x590a0020 0x6320756f 0x6f6e6e61 0x6e652074 0x20726574 0x69206e61 0x6765746e
0x10010060 0x6c207265 0x20737365 0x6e616874 0x20726f20 0x61757165 0x6f74206c 0x200a3020 0x6f590a00
0x10010080 0x61682075 0x69206576 0x7475706e 0x20646574 0x68732061 0x2074726f 0x61697274 0x656c676e
0x100100a0 0x590a000a 0x6820756f 0x20657661 0x75706e69 0x64657474 0x74206120 0x206c6c61 0x61697274
Mars Messages
Run I/O
Clear
Enter the base of the triangle: 10
Enter the height of the triangle: 3000
You have inputted a regular triangle
The area of your triangle is 15000
Enter the base of the triangle: 4343
Enter the height of the triangle: 1
You have inputted a short triangle
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-- program is finished running --