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CS 264

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**Lab 5**

**Code:**

.data

array: .space 40

prompt1: .asciiz "Please enter a number for the size of array (1-10): "

prompt2 :.asciiz "Please enter a number: "

prompt3: .asciiz "To compute combination of n and r, please enter n >= 0: "

prompt4: .asciiz "To compute combination of n and r, please enter r >= 0 and r <= n:"

result1: .asciiz "Smallest integer result: "

result2: .asciiz "Combination result: "

error: .asciiz "Invalid value. Please re-enter both n and r."

newline: .asciiz "\n"

.text

.globl main

main: jal fillarr

la $a0, array #load address of A[]

jal min

move $t0, $v0 #move result to t0

la $a0, newline

li $v0, 4

syscall

la $a0, result1

li $v0, 4

syscall

move $a0, $t0 #move result to a0 to be printed

li $v0, 1

syscall

la $a0, newline

li $v0, 4

syscall

jal combuser

move $t0, $v0 #move result to t0

la $a0, newline

li $v0, 4

syscall

la $a0, result2

li $v0, 4

syscall

move $a0, $t0 #move result to a0 to be printed

li $v0, 1

syscall

la $a0, newline

li $v0, 4

syscall

end: li $v0, 10

syscall

fillarr: la $a0, prompt1

li $v0, 4

syscall

li $v0, 5

syscall

move $t1, $v0 #set loop counter to user input

move $a2, $v0 #set high for min function

addi $a2, $a2, -1 #-1 for array indices starting at 0

li $a1, 0 #set low for min function later

la $t0, array

b fillloop

fillloop: la $a0, prompt2

li $v0, 4

syscall

li $v0, 5

syscall

sw $v0, 0($t0) #store in array

addi $t1, $t1, -1 #decrement loop counter

addi $t0, $t0, 4 #next array position

bnez $t1, fillloop #if loop counter != 0 loop back

jr $ra #else return to main

min: bne $a1, $a2, mincont

sll $a1, $a1, 2

add $t0, $a0, $a1

lw $v0, 0($t0)

jr $ra

mincont: addiu $sp, $sp, -20

sw $ra, 0($sp)

sw $a0, 4($sp)

sw $a2, 8($sp)

add $a2, $a1, $a2

srl $a2, $a2, 1

sw $a2, 12($sp)

jal min

sw $v0, 16($sp)

lw $a0, 4($sp)

lw $a2, 8($sp)

lw $a1, 12($sp)

addi $a1, $a1, 1

jal min

lw $t0, 16($sp)

lw $ra, 0($sp)

addiu $sp, $sp, 20

bgt $t0, $v0, mincont2

move $v0, $t0

mincont2: jr $ra

combuser: la $a0, newline

li $v0, 4

syscall

la $a0, prompt3

syscall

li $v0, 5

syscall

bltz $v0, err

move $t0, $v0 #store n in $t0

li $v0, 4

la $a0, prompt4

syscall

li $v0, 5

syscall

bltz $v0, err

blt $t0, $v0, err

move $a1, $v0 #store r in $a1

move $a0, $t0 #store n in $a0

b comb

err: la $a0, newline

li $v0, 4

syscall

la $a0, error

li $v0, 4

syscall

la $a0, newline

syscall

b combuser

comb: beq $a0, $a1, combcont

beqz $a1, combcont

addiu $sp, $sp, -16

sw $ra, 0($sp)

addi $a0, $a0, -1

sw $a0, 4($sp)

sw $a1, 8($sp)

jal comb

sw $v0, 12($sp)

lw $a0, 4($sp)

lw $a1, 8($sp)

addi $a1, $a1, -1

jal comb

lw $t0, 12($sp)

add $v0, $t0, $v0

lw $ra, 0($sp)

addiu $sp, $sp, 16

jr $ra

combcont: li $v0, 1

jr $ra

**Output:**





