.data

user: .space 100

upper: .space 108

lower: .space 104

upAlph: .asciiz "ABCDEFGHIJKLMNOPQRSTUVWXYZ"

loAlph: .asciiz "abcdefghijklmnopqrstuvwxyz"

Prompt: .asciiz "Please enter a string: "

upres: .asciiz "\nThe Uppercase array: "

lowres: .asciiz "\nThe Lowercase array: "

spaces: .asciiz "spaces "

space: .asciiz " "

.globl main

.text

main:

la $a0, Prompt

li $v0, 4

syscall

li $v0, 8

la $a0, user #user input

li $a1, 100 #setting string limit

syscall

la $a0, user

la $a1, upper

la $a2, lower

li $t0, 26

j populate #fill uppercase and lowercase counter arrays

filled:

la $a1, upper

la $a2, lower

jal frequency #call function

la $a0, upres #Uppercase results

li $v0, 4

syscall

la $t0, upper #uppercase array

li $t1, 0 #counter

li $t2, 65 #Ascii value of A

jal print #print function

la $a0, lowres

li $v0, 4

syscall

la $t0, lower

li $t1, 0 #counter

li $t2, 97 #Ascii value of a

jal print

la $a0, spaces

li $v0, 4

syscall

la $t0, upper

lw $a0, 104($t0) #spaces counter

li $v0, 1

syscall

li $v0, 10

syscall

populate: #This function fills both arrays with zeros

li $t1, 0

sw $t1, 0($a1)

sw $t1, 0($a2)

addi $a1, $a1, 4

addi $a2, $a2, 4

addi $t0, $t0, -1

bgez $t0, populate

la $a1, upper

la $a2, lower

j filled

frequency:

li $t1, 0

lb $t0, 0($a0)

beqz $t0, EOS #End of String

ble $t0, 90, upperc #Less than 'Z'

bge $t0, 97, lowerc #Greater than 'a'

upperc: bge $t0, 65, upletter #Greater than 'A'

beq $t0, 32, wspace #Whitespace

addi $a0, $a0, 1 #increment

j frequency

upletter:

addi $t1, $t0, -65 #Subtract ascii value of 'A' for array index

sll $t1, $t1, 2 #Multiply by 4

add $a1, $a1, $t1 #Go to correct index

lw $t2, 0($a1)

addi $t2, $t2, 1

sw $t2, 0($a1)

la $a1, upper

addi $a0, $a0, 1

j frequency

lowerc: ble $t0, 122, lowletter #Less than 'z'

addi $a0, $a0, 1 #increment

j frequency

lowletter:

addi $t1, $t0, -97 #Subtract ascii value of 'a' for array index

sll $t1, $t1, 2

add $a2, $a2, $t1

lw $t2, 0($a2)

addi $t2, $t2, 1

sw $t2, 0($a2)

la $a2, lower

addi $a0, $a0, 1

j frequency

wspace: la $t0, upper

lw $t1, 104($t0) #Space counter index

addi $t1, $t1, 1

sw $t1, 104($t0)

addi $a0, $a0, 1

j frequency

EOS: jr $ra

print: add $t3, $t2, $t1 #count + ascii value

move $a0, $t3

li $v0, 11 #print char

syscall

lw $a0, 0($t0)

li $v0, 1

syscall

la $a0, space

li $v0, 4

syscall

addi $t1, $t1, 1

addi $t0, $t0, 4

ble $t1, 25, print

jr $ra