.data

global\_length: .word 10

global\_width: .word 8

global\_firstLowerCase: .word 97

global\_firstUpperCase: .word 65

global\_lastLowerCase: .word 122

global\_lastUpperCase: .word 90

global\_globalInt: .word 0

global\_globalIntArray: .space 176

global\_globalInt2: .word 0

global\_globalIntArray2: .space 264

global\_globalInt3: .word 0

global\_globalChar: .word 0

global\_globalCharArray: .space 176

global\_globalChar2: .word 0

global\_globalCharArray2: .space 264

global\_globalChar3: .word 0

string\_0: .asciiz "original: "

string\_1: .asciiz " changed: "

string\_2: .asciiz "start "

string\_3: .asciiz " "

string\_4: .asciiz "%c"

string\_5: .asciiz "nothing"

string\_6: .asciiz " "

.text

j f\_main

f\_fib:

addiu $sp $sp -72

sw $ra 68($sp)

sw $fp 64($sp)

sw $s0 60($sp)

sw $s1 56($sp)

sw $s2 52($sp)

sw $s3 48($sp)

sw $s4 44($sp)

sw $s5 40($sp)

sw $s6 36($sp)

sw $s7 32($sp)

sw $a0 104($sp)

sw $a1 108($sp)

label\_0:

lw $t0 104($sp) #n

lw $t1 108($sp) #k

# writeBack

sw $t0 104($sp) # n

sw $t1 108($sp) # k

# end writeBack

bgt $t0 $t1 label\_1

# writeBack

# end writeBack

label\_2:

li $v0 1 #const\_int\_5

j f\_fib\_return

# writeBack

# end writeBack

# writeBack

# end writeBack

label\_1:

li $s1 0 # res

lw $t0 104($sp) #n

lw $t1 108($sp) #k

subu $t2 $t0 $t1 # sub\_0

move $s0 $t2 # i

# writeBack

sw $t0 104($sp) # n

sw $t1 108($sp) # k

sw $t2 12($sp) # sub\_0

# end writeBack

label\_3:

lw $t0 104($sp) #n

# writeBack

sw $t0 104($sp) # n

# end writeBack

bge $s0 $t0 label\_4

# call func: fib

addiu $sp $sp -8

move $a0 $s0

lw $a1 116($sp) #k

addiu $sp $sp -32

sw $t0 0($sp)

sw $t1 4($sp)

sw $t2 8($sp)

sw $t3 12($sp)

sw $t4 16($sp)

sw $t5 20($sp)

sw $t6 24($sp)

sw $t7 28($sp)

jal f\_fib

lw $t0 0($sp)

lw $t1 4($sp)

lw $t2 8($sp)

lw $t3 12($sp)

lw $t4 16($sp)

lw $t5 20($sp)

lw $t6 24($sp)

lw $t7 28($sp)

addiu $sp $sp 32

addiu $sp $sp 8

lw $a0 104($sp)

lw $a1 108($sp)

move $t0 $v0

# back from func: fib

addu $t1 $s1 $t0 # add\_1

move $s1 $t1 # res

addiu $t2 $s0 1 # add\_2

move $s0 $t2 # i

# writeBack

sw $t0 8($sp) # fcall\_22

sw $t1 4($sp) # add\_1

sw $t2 0($sp) # add\_2

# end writeBack

j label\_3

# writeBack

# end writeBack

label\_4:

move $v0 $s1

j f\_fib\_return

# writeBack

# end writeBack

# writeBack

# end writeBack

label\_5:

f\_fib\_return:

lw $s0 60($sp)

lw $s1 56($sp)

lw $s2 52($sp)

lw $s3 48($sp)

lw $s4 44($sp)

lw $s5 40($sp)

lw $s6 36($sp)

lw $s7 32($sp)

lw $ra 68($sp)

lw $fp 64($sp)

addiu $sp $sp 72

jr $ra

f\_print:

addiu $sp $sp -48

sw $ra 44($sp)

sw $fp 40($sp)

sw $s0 36($sp)

sw $s1 32($sp)

sw $s2 28($sp)

sw $s3 24($sp)

sw $s4 20($sp)

sw $s5 16($sp)

sw $s6 12($sp)

sw $s7 8($sp)

label\_6:

li $s0 32 # i

# writeBack

# end writeBack

label\_7:

li $t0 34 #const\_int\_36

# writeBack

# end writeBack

beq $s0 $t0 label\_8

# writeBack

# end writeBack

label\_9:

li $v0 11 # printf char

move $a0 $s0

syscall

# writeBack

# end writeBack

j label\_10

# writeBack

# end writeBack

label\_8:

# writeBack

# end writeBack

label\_10:

addiu $t0 $s0 1 # add\_3

move $s0 $t0 # i

li $t1 127 #const\_int\_48

# writeBack

sw $t0 0($sp) # add\_3

# end writeBack

bge $s0 $t1 label\_11

# writeBack

# end writeBack

j label\_7

# writeBack

# end writeBack

label\_11:

f\_print\_return:

lw $s0 36($sp)

lw $s1 32($sp)

lw $s2 28($sp)

lw $s3 24($sp)

lw $s4 20($sp)

lw $s5 16($sp)

lw $s6 12($sp)

lw $s7 8($sp)

lw $ra 44($sp)

lw $fp 40($sp)

addiu $sp $sp 48

jr $ra

f\_toUpperCase:

addiu $sp $sp -56

sw $ra 52($sp)

sw $fp 48($sp)

sw $s0 44($sp)

sw $s1 40($sp)

sw $s2 36($sp)

sw $s3 32($sp)

sw $s4 28($sp)

sw $s5 24($sp)

sw $s6 20($sp)

sw $s7 16($sp)

sw $a0 88($sp)

label\_12:

lb $t0 88($sp) #x

lb $t1 global\_firstLowerCase #firstLowerCase

# writeBack

sb $t0 88($sp) # x

sb $t1 global\_firstLowerCase #firstLowerCase

# end writeBack

blt $t0 $t1 label\_13

# writeBack

# end writeBack

label\_14:

lb $t0 88($sp) #x

lb $t1 global\_lastLowerCase #lastLowerCase

# writeBack

sb $t0 88($sp) # x

sb $t1 global\_lastLowerCase #lastLowerCase

# end writeBack

bgt $t0 $t1 label\_15

# writeBack

# end writeBack

label\_16:

lb $t0 88($sp) #x

lb $t1 global\_firstLowerCase #firstLowerCase

subu $t2 $t0 $t1 # sub\_4

lb $t3 global\_firstUpperCase #firstUpperCase

addu $t4 $t2 $t3 # add\_5

move $s0 $t4 # c

move $v0 $s0

j f\_toUpperCase\_return

# writeBack

sb $t0 88($sp) # x

sb $t1 global\_firstLowerCase #firstLowerCase

sw $t2 4($sp) # sub\_4

sb $t3 global\_firstUpperCase #firstUpperCase

sw $t4 0($sp) # add\_5

# end writeBack

# writeBack

# end writeBack

label\_15:

lb $v0 88($sp) #x

j f\_toUpperCase\_return

# writeBack

# end writeBack

# writeBack

# end writeBack

label\_17:

# writeBack

# end writeBack

j label\_18

# writeBack

# end writeBack

label\_13:

lb $v0 88($sp) #x

j f\_toUpperCase\_return

# writeBack

# end writeBack

# writeBack

# end writeBack

label\_18:

f\_toUpperCase\_return:

lw $s0 44($sp)

lw $s1 40($sp)

lw $s2 36($sp)

lw $s3 32($sp)

lw $s4 28($sp)

lw $s5 24($sp)

lw $s6 20($sp)

lw $s7 16($sp)

lw $ra 52($sp)

lw $fp 48($sp)

addiu $sp $sp 56

jr $ra

f\_changeGlobal:

addiu $sp $sp -40

sw $ra 36($sp)

sw $fp 32($sp)

sw $s0 28($sp)

sw $s1 24($sp)

sw $s2 20($sp)

sw $s3 16($sp)

sw $s4 12($sp)

sw $s5 8($sp)

sw $s6 4($sp)

sw $s7 0($sp)

label\_19:

li $v0 4 # printf string

la $a0 string\_0

syscall

li $v0 1 # printf int

lw $a0 global\_globalInt #globalInt

syscall

li $t0 16 #const\_int\_80

# globalInt

sw $t0 global\_globalInt #globalInt

li $v0 4 # printf string

la $a0 string\_1

syscall

li $v0 1 # printf int

lw $a0 global\_globalInt #globalInt

syscall

f\_changeGlobal\_return:

lw $s0 28($sp)

lw $s1 24($sp)

lw $s2 20($sp)

lw $s3 16($sp)

lw $s4 12($sp)

lw $s5 8($sp)

lw $s6 4($sp)

lw $s7 0($sp)

lw $ra 36($sp)

lw $fp 32($sp)

addiu $sp $sp 40

jr $ra

f\_dealRequest:

addiu $sp $sp -76

sw $ra 72($sp)

sw $fp 68($sp)

sw $s0 64($sp)

sw $s1 60($sp)

sw $s2 56($sp)

sw $s3 52($sp)

sw $s4 48($sp)

sw $s5 44($sp)

sw $s6 40($sp)

sw $s7 36($sp)

sw $a0 108($sp)

li $s1 120

label\_20:

li $v0 4 # printf string

la $a0 string\_2

syscall

li $s2 121 # y

lw $t0 108($sp) #operation

li $t1 0 #const\_int\_89

# writeBack

sw $t0 108($sp) # operation

# end writeBack

bne $t0 $t1 label\_21

# writeBack

# end writeBack

label\_22:

li $s0 1 # i

# writeBack

# end writeBack

label\_23:

lw $t0 global\_length #length

# writeBack

sw $t0 global\_length #length

# end writeBack

bgt $s0 $t0 label\_24

li $t0 2 # sub\_6

# call func: fib

addiu $sp $sp -8

move $a0 $s0

move $a1 $t0

addiu $sp $sp -32

sw $t0 0($sp)

sw $t1 4($sp)

sw $t2 8($sp)

sw $t3 12($sp)

sw $t4 16($sp)

sw $t5 20($sp)

sw $t6 24($sp)

sw $t7 28($sp)

jal f\_fib

lw $t0 0($sp)

lw $t1 4($sp)

lw $t2 8($sp)

lw $t3 12($sp)

lw $t4 16($sp)

lw $t5 20($sp)

lw $t6 24($sp)

lw $t7 28($sp)

addiu $sp $sp 32

addiu $sp $sp 8

lw $a0 108($sp)

move $t1 $v0

# back from func: fib

li $v0 4 # printf string

la $a0 string\_3

syscall

li $v0 1 # printf int

move $a0 $t1

syscall

addiu $t2 $s0 1 # add\_7

move $s0 $t2 # i

# writeBack

sw $t0 16($sp) # sub\_6

sw $t1 12($sp) # fcall\_102

sw $t2 8($sp) # add\_7

# end writeBack

j label\_23

# writeBack

# end writeBack

label\_24:

# writeBack

# end writeBack

j label\_25

# writeBack

# end writeBack

label\_21:

lw $t0 108($sp) #operation

li $t1 1 #const\_int\_113

# writeBack

sw $t0 108($sp) # operation

# end writeBack

bne $t0 $t1 label\_26

# writeBack

# end writeBack

label\_27:

# call voidfunc: print

addiu $sp $sp -0

addiu $sp $sp -32

sw $t0 0($sp)

sw $t1 4($sp)

sw $t2 8($sp)

sw $t3 12($sp)

sw $t4 16($sp)

sw $t5 20($sp)

sw $t6 24($sp)

sw $t7 28($sp)

jal f\_print

lw $t0 0($sp)

lw $t1 4($sp)

lw $t2 8($sp)

lw $t3 12($sp)

lw $t4 16($sp)

lw $t5 20($sp)

lw $t6 24($sp)

lw $t7 28($sp)

addiu $sp $sp 32

addiu $sp $sp 0

lw $a0 108($sp)

# back from voidfunc: print

# writeBack

# end writeBack

j label\_28

# writeBack

# end writeBack

label\_26:

lw $t0 108($sp) #operation

li $t1 2 #const\_int\_120

# writeBack

sw $t0 108($sp) # operation

# end writeBack

bne $t0 $t1 label\_29

# writeBack

# end writeBack

label\_30:

# call func: toUpperCase

addiu $sp $sp -4

move $a0 $s1

addiu $sp $sp -32

sw $t0 0($sp)

sw $t1 4($sp)

sw $t2 8($sp)

sw $t3 12($sp)

sw $t4 16($sp)

sw $t5 20($sp)

sw $t6 24($sp)

sw $t7 28($sp)

jal f\_toUpperCase

lw $t0 0($sp)

lw $t1 4($sp)

lw $t2 8($sp)

lw $t3 12($sp)

lw $t4 16($sp)

lw $t5 20($sp)

lw $t6 24($sp)

lw $t7 28($sp)

addiu $sp $sp 32

addiu $sp $sp 4

lw $a0 108($sp)

move $t0 $v0

# back from func: toUpperCase

li $v0 4 # printf string

la $a0 string\_4

syscall

li $v0 11 # printf char

move $a0 $t0

syscall

# call func: toUpperCase

addiu $sp $sp -4

li $a0 116 #const\_char\_126

addiu $sp $sp -32

sw $t0 0($sp)

sw $t1 4($sp)

sw $t2 8($sp)

sw $t3 12($sp)

sw $t4 16($sp)

sw $t5 20($sp)

sw $t6 24($sp)

sw $t7 28($sp)

jal f\_toUpperCase

lw $t0 0($sp)

lw $t1 4($sp)

lw $t2 8($sp)

lw $t3 12($sp)

lw $t4 16($sp)

lw $t5 20($sp)

lw $t6 24($sp)

lw $t7 28($sp)

addiu $sp $sp 32

addiu $sp $sp 4

lw $a0 108($sp)

move $t1 $v0

# back from func: toUpperCase

li $v0 11 # printf char

move $a0 $t1

syscall

# writeBack

sb $t0 4($sp) # fcall\_124

sb $t1 0($sp) # fcall\_127

# end writeBack

j label\_31

# writeBack

# end writeBack

label\_29:

lw $t0 108($sp) #operation

li $t1 3 #const\_int\_132

# writeBack

sw $t0 108($sp) # operation

# end writeBack

bne $t0 $t1 label\_32

# writeBack

# end writeBack

label\_33:

# call voidfunc: changeGlobal

addiu $sp $sp -0

addiu $sp $sp -32

sw $t0 0($sp)

sw $t1 4($sp)

sw $t2 8($sp)

sw $t3 12($sp)

sw $t4 16($sp)

sw $t5 20($sp)

sw $t6 24($sp)

sw $t7 28($sp)

jal f\_changeGlobal

lw $t0 0($sp)

lw $t1 4($sp)

lw $t2 8($sp)

lw $t3 12($sp)

lw $t4 16($sp)

lw $t5 20($sp)

lw $t6 24($sp)

lw $t7 28($sp)

addiu $sp $sp 32

addiu $sp $sp 0

lw $a0 108($sp)

# back from voidfunc: changeGlobal

# writeBack

# end writeBack

j label\_34

# writeBack

# end writeBack

label\_32:

li $v0 4 # printf string

la $a0 string\_5

syscall

# writeBack

# end writeBack

label\_34:

# writeBack

# end writeBack

label\_31:

# writeBack

# end writeBack

label\_28:

# writeBack

# end writeBack

label\_25:

f\_dealRequest\_return:

lw $s0 64($sp)

lw $s1 60($sp)

lw $s2 56($sp)

lw $s3 52($sp)

lw $s4 48($sp)

lw $s5 44($sp)

lw $s6 40($sp)

lw $s7 36($sp)

lw $ra 72($sp)

lw $fp 68($sp)

addiu $sp $sp 76

jr $ra

f\_main:

addiu $sp $sp -52

label\_35:

li $t0 0 #const\_int\_139

# globalInt

sw $t0 global\_globalInt #globalInt

li $v0 5

syscall

move $s1 $v0

li $s0 0 # i

# writeBack

# end writeBack

label\_36:

# writeBack

# end writeBack

bge $s0 $s1 label\_37

# call voidfunc: dealRequest

addiu $sp $sp -4

move $a0 $s0

addiu $sp $sp -32

sw $t0 0($sp)

sw $t1 4($sp)

sw $t2 8($sp)

sw $t3 12($sp)

sw $t4 16($sp)

sw $t5 20($sp)

sw $t6 24($sp)

sw $t7 28($sp)

jal f\_dealRequest

lw $t0 0($sp)

lw $t1 4($sp)

lw $t2 8($sp)

lw $t3 12($sp)

lw $t4 16($sp)

lw $t5 20($sp)

lw $t6 24($sp)

lw $t7 28($sp)

addiu $sp $sp 32

addiu $sp $sp 4

# back from voidfunc: dealRequest

li $v0 4 # printf string

la $a0 string\_6

syscall

addiu $t0 $s0 1 # add\_8

move $s0 $t0 # i

# writeBack

sw $t0 0($sp) # add\_8

# end writeBack

j label\_36

# writeBack

# end writeBack

label\_37:

mips输入：

5

mips输出结果为：

start 1 1 2 3 5 8 13 21 34 55 start !#$%&'()\*+,-./0123456789:;<=>?@ABCDEFGHIJKLMNOPQRSTUVWXYZ[\]^\_`abcdefghijklmnopqrstuvwxyz{|}~ start %cXT start original: 0 changed: 16 start nothing

与预期一致

仍有部分情况没有测试