

ΕΡΓΑΣΤΗΡΙΟ ΑΡΧΙΤΕΚΤΟΝΙΚΗΣ ΥΠΟΛΟΓΙΣΤΩΝ

ΕΡΓΑΣΤΗΡΙΑΚΗ ΑΣΚΗΣΗ 5

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Ομάδα Α4

Εγχειρίδιο Ασκήσεων Εργαστηρίου Συμβολικής Γλώσσας (Assembly) – Χ.Βέργος

(άσκηση 4/ σελ. 9)

i. Υπολογισμός μαθηματικού τύπου

.arm

.text

.global main

main:

stmdb r13!,{r1-r10,pc} @fortwsh twn kataxwrhtwn pou tha xrhsimopoihsoume

ldr r0, =values @fortwsh twn timwn

mov r4, #0x5 @ stathera pol/smou

ldr r5, =const @ statheres Z

mov r10, #0x0 @ counter

bl subroutine

ldmia r13!,{r1- r10} @clear kataxwrhtes

subroutine:

stmdb r13!,{r1-r10}

cmp r10, #4 @arithmos epanalhpsewn

beq end_subroutine

ldrb r1, [r0], #1 @fortwsh ston r1, to periexomeno tou kataxwrhth r0

ldrb r2, [r0], #1 @fortwsh ston r2, to periexomeno tou kataxwrhth r0

ldrb r3, [r0], #1 @fortwsh ston r3, to periexomeno tou kataxwrhth r0

ldrb r6, [r5, #0] @fortwsh ston r6, to periexomeno tou kataxwrhth r5 (stathera z0)

ldrb r7, [r5, #1] @fortwsh ston r7, to periexomeno tou kataxwrhth r5+1 (stathera z1)

ldrb r8, [r5, #2] @fortwsh ston r8 , to periexomeno tou kataxwrhth r5+2 (stathera z2)

mul r1, r6, r1 @ektelesh ths arithmhtikhs prakshs

mul r2, r7, r2

mul r3, r8, r3

add r1, r2 , r1

sub r1 , r1, r3

mul r1 , r4, r1

mov r1 , r1, asr #6 @diaresh me 64

add r10, r10 , #0x1 @ aukshsh tou counter

b subroutine

end_subroutine:

ldmia r13!,{r1- r10} @clear kataxwrhtes

mov PC,LR

.data

values:

.byte 0x02 , 0x03 , 0x04

.byte 0x10, 0x05 , 0x06

.byte 0x0B , 0x02, 0x0D

.byte 0x01, 0x0C, 0x08

const:

.byte 0x04 , 0x07 , 0x05

Αριθμός Επανάληψης	Αποτέλεσμα
1	0x00000000
2	0x00000005
3	0xFFFFFFFF
4	0x00000003

ii. Εύρεση μέγιστης τιμής σε πίνακα αποτελεσμάτων

.arm

.text

.global main

main:

stmdb r13!,{r1, r10} @fortwsh tw n kataxwrhtwn pou tha xrhsimopoihsoume

ldr r0, =values @fortwsh tw n timwn

mov r4, #0x5 @ stathera pol/smou

ldr r5, =const @ statheres Z

mov r10, #0x0 @ counter

mov r11, #0x0 @max

mov r12, #0x0 @set number

bl subroutine

ldmia r13!,{r1, r10} @clear kataxwrhtes

subroutine:

stmdb r13!,{r1, r10}

cmp r10, #4 @arithmos epanalhpsewn

beq halt

ldrb r1, [r0], #1 @fortwsh ston r1, to periexomeno tou kataxwrhth r0

ldrb r2, [r0], #1 @fortwsh ston r2, to periexomeno tou kataxwrhth r0

ldrb r3, [r0], #1 @fortwsh ston r3, to periexomeno tou kataxwrhth r0

ldrb r6, [r5, #0] @fortwsh ston r6, to periexomeno tou kataxwrhth r5 (stathera z0)

ldrb r7, [r5, #1] @fortwsh ston r7, to periexomeno tou kataxwrhth r5+1 (stathera z1)

ldrb r8, [r5, #2] @fortwsh ston r8, to periexomeno tou kataxwrhth r5+2 (stathera z2)

mul r1, r6, r1 @ektelesh ths arithmhtikhs prakshs

mul r2, r7, r2

mul r3, r8, r3

add r1, r2, r1

sub r1, r1, r3

mul r1, r4, r1

mov r1 , r1, asr #6 @diaresh me 64

cmp r11, r1 @ sygkrish

blt swap

swap:

movhi r11, r1

mov r12, r10

strb r11, [r5, #0x4]

b increment

increment:

add r10, r10 , #0x1 @ aukshsh tou counter

b subroutine

halt:

ldmia r13!, {r0-r12}

mov pc, lr

.data

values:

.byte 0x02 , 0x03 , 0x04

.byte 0x10, 0x05 , 0x06

.byte 0x0B , 0x02, 0x0D

.byte 0x01, 0x0C, 0x08

const:

.byte 0x04 , 0x07 , 0x05

iii. Υπολογισμός πολυωνύμου

.arm

.text

.global main

main:

stmdb r13!, {r0-r12, r14} @fortwsh kataxwrhtwn pou tha xrhsimopoihsoume

ldr r2, =Values @thesh mnhmhs tou label Values

mov r1, #0 @counter epanalhpsewn

loop1:

ldr r0, [r2]

bl subroutine @klhsh ths uporoutinas mas

add r1, r1, #1 @ aukshsh tou counter

add r2, r2, #4 @anagnwsh ths epomenhs timhs

cmp r1, #4 @elegkths epanalhpsewn

bne loop1

ldmia r13!, {r0-r12, pc} @clear tous kataxwrhtes

subroutine:

stmdb R13!, {R1-R4} @fortwsh twn kataxwrhtwn pou tha xrhsimopoihsoume

ldr r1, =Const @fortwsh twn a0,a1,a2....

mov r2, r0

mov r4, #0 @counter epanalhpsewn gia thn nea loop

ldrb r0, [r1, r4]

loop2:

add r4, r4, #1

ldrsb r3, [r1, r4]

mla r0, r2, r0, r3 /* MANUAL!!!!*/

cmp r4, #6 @ 6 stoixeia = 6 epanalhpseis

bne loop2

ldmia r13!, {r1-r4} @clear tous kataxwrhtes

mov pc, lr @termatismos

.data

Values:

.word 0x10

.word 0x50A

.word 0xCDCA

.word 0x80AB

Const:

.byte 0x04, 0x07, 0x05

.byte 0x20, 0x1A, 0x12, 0x06