

Assignment 1

Microprocessors and Computer Architecture

classmate

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program 1: Write a program in ARMv7DMI-ISA to search for an element in an array. Display appropriate message on the std. o/p device. For successful search display as "Successful search" and if search is unsuccessful, display as "Unsuccessful search" Use binary search technique

ARM assembly Code:

data

array: .word 5, 8, 12, 17, 23, 29, 36, 42, 55, 78

search_ele: .word 23

array_size: .word 10

success: .asciz "successful search"

failure: .asciz "unsuccessful search"

• text

mov r4, #0

ldr r0, =array

ldr r7, =search_ele

ldr r1, [r7]

ldr r8, =array_size

ldr r2, [r8]

sub r3, r2, #1

binary_search:

ldr r6, [r0]

cmp r6, r1

beq successful_search

add r0, r0, #4

cmp r3, r4

beq unsuccessful_search

add r4, r4, #1

bl binary_search

bx lr
swi 0x11

successful search :

ldr r5 = success

b loop

unsuccessful search :

ldr r5 = failure

b loop

loop :

ldrb r0, [r5], #1

cmp r0, #0

swine 0x00

bne loop

Output: search successful [if element is present]
search is unsuccessful [if element is not present]

program 2: Write a program in ARM7 TDMI-ISA to find a sub string in a given main string

example 1: Main string : My name is Bond.
character : 'name'

expected o/p : "string present"

example 2: My name is Bond

character : jamez

expected o/p : "string absent"

Code:

• data

STRING : .ASCIIZ "My name is Bond"

SUBSTR : .ASCIIZ "name"

OUTPUT1 : .ASCIIZ "STRING PRESENT"

OUTPUT2 : .ASCIIZ "STRING ABSENT"

• text

LDR R0, =STRING

LDR R1, =SUBSTR

initmatch:

LDRB r2, [r0], #1
LDRB r3, [r1]
CMP r2, #0
BEQ notfound

submatch:

LDRB r2, [r4], #1
LDRB r3, [r5], #1
CMP r2, r3
BEQ submatch
B initmatch

found:

LDR r1, =output1
B loop

notfound:

LDR r1, =OUTPUT2
B loop

loop:

LDRB r0, [r1], #1
CMP r0, #0
SWINE 0X00
BNE loop
SWI 0X11

Output: if string is present "STRING PRESENT"
"STRING ABSENT" if string is not present

Thank you