Computer Science Department

CS2208b: Introduction to Computer Organization and Architecture

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ARM Stack Frame

```
AREA TestProg, CODE, READONLY
                       ;This is the calling environment
    ENTRY
Main ADR sp, Stack ; set up r13 as the stack pointer
     MOV
           r0, #124 ; set up a dummy parameter in r0
           fp, #123
                       ;set up dummy frame pointer
     MOV
           r0,[sp,#-4]! ;push the parameter
     STR
     BL
           Sub
                       ; call the subroutine
     LDR
           r1, [sp], #4 ; pop the parameter
           Loop ; wait here (endless loop)
Loop
    В
```

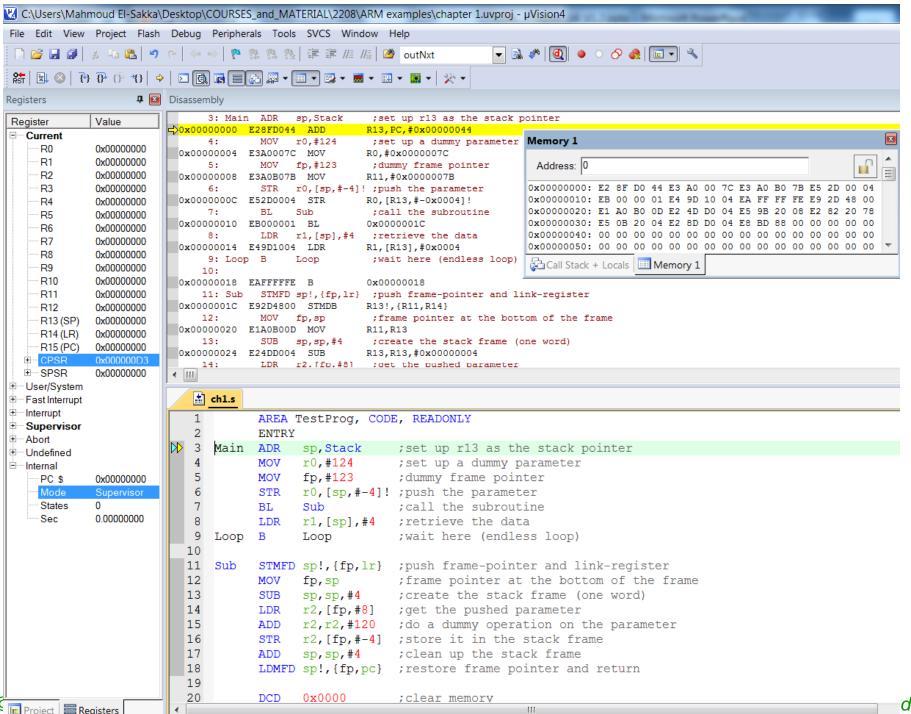


ARM Stack Frame

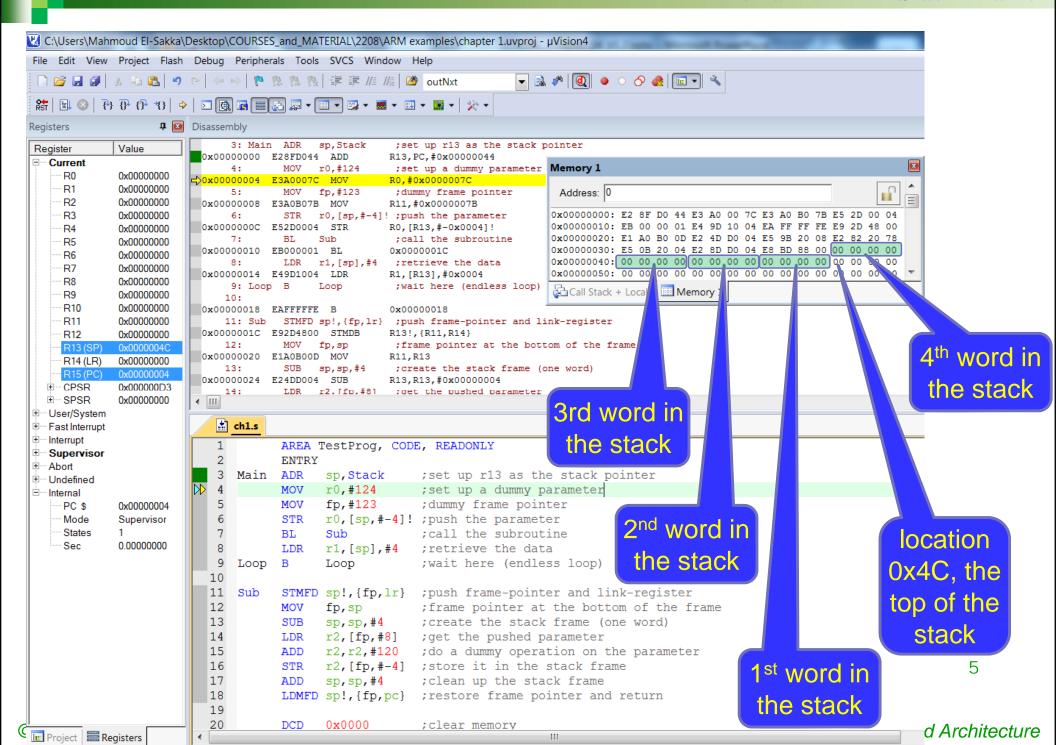
```
Sub
      STMFD sp!, {fp, lr}
                           ; push frame-pointer and link-register
      MOV
            fp,sp
                           ; frame pointer at the bottom of the frame
      SUB
           \mathtt{sp}, \mathtt{sp}, \sharp 4
                           ; create the stack frame (one word)
      LDR
             r2,[fp,#8] ;get the pushed parameter
      ADD
           r2, r2, #120 ; do a dummy operation on the parameter
           r2,[fp,#-4] ;store it in the stack frame
      STR
body
of an
      ADD
             sp,sp,#4
                            ; clean up the stack frame
FD
      LDMFD sp!, {fp,pc}
                           ; restore frame pointer and return
stack
                               To be used as a local variable
      DCD
             0x0000
                            ; clear memory
             0 \times 00000
      DCD
                             To be used to push fp (i.e., R11)
             0x0000
      DCD
                             To be used to push Ir (i.e., R14)
             0x0000
      DCD
             0x0000
                           istart of the stack
Stack DCD
      END
                        To be used to push the parameter
```

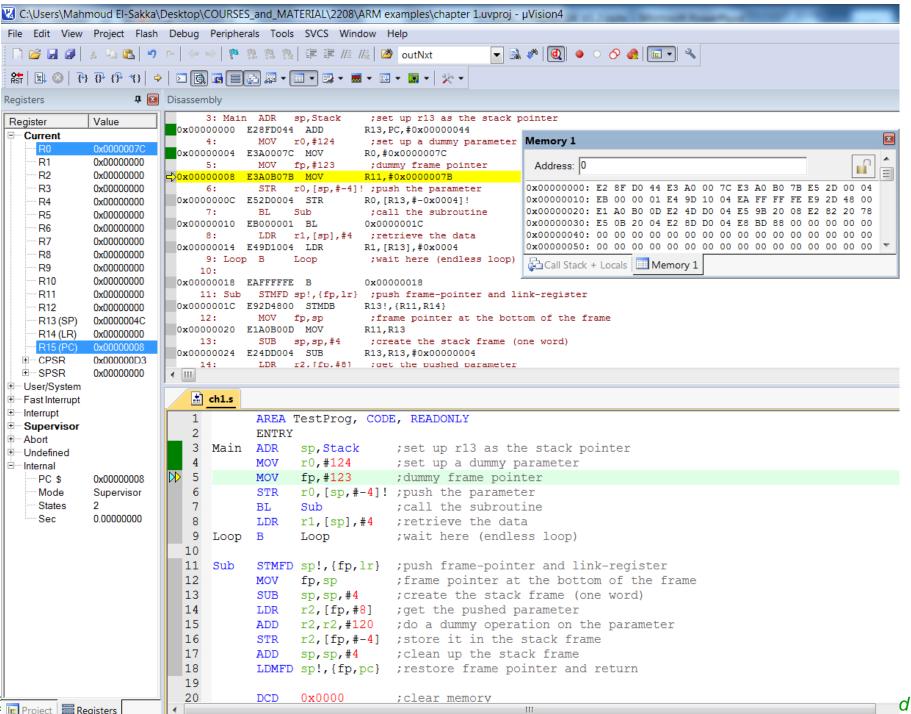
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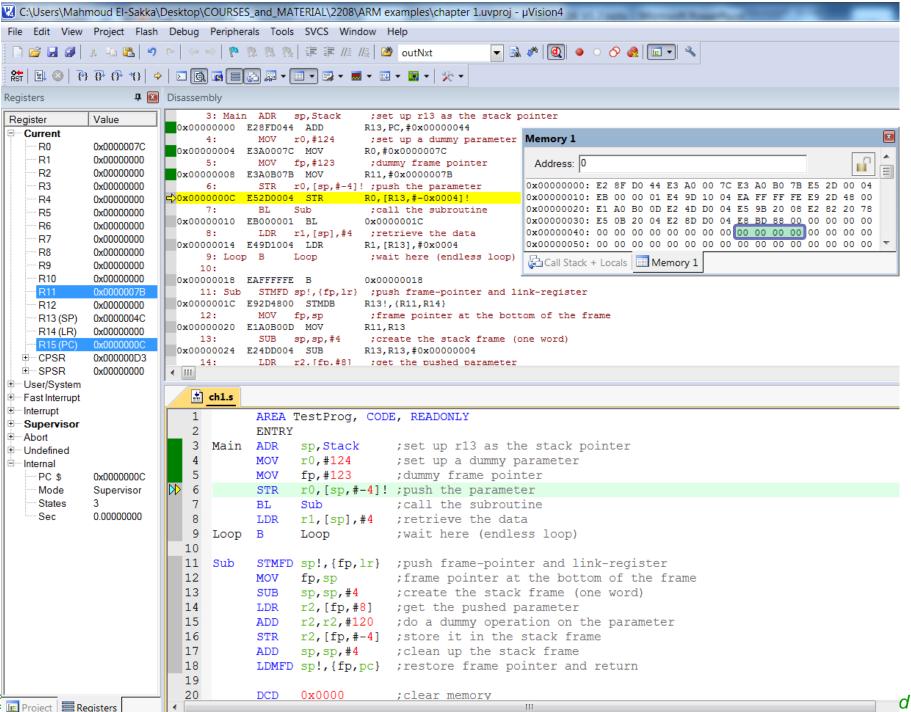
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d Architecture

