Another Programming Solution for FIR

Parameters:

r0: coef

ptr # r1: input

ptr # r2: filter length (must be 4, 8, # a multiple of 4)

fir push {r4-r11}

mov r12, r2

mov r3, #0

mov r2, #0

fir\_loop\_start ldmia r0!, {r4-r7}

ldmia r1!, {r8-r11}

smlal r2, r3, r4, r8

smlal r2, r3, r5, r9

smlal r2, r3, r6, r10

smlal r2, r3, r7, r11

subs r12, r12, #4

bgt fir\_loop\_start

mov r0, r2

mov r1, r3

pop {r4-r11}

bx lr

Recursive Program – Factorial Example

stack EQU 0x1000

input EQU 6

factorial CMP R1, #0

MOVEQ R1, #1

BEQ exit ; terminating condition – factorial of 0 = 1

STMFD SP!, {R1, LR}

SUB R1, R1, #1

BL factorial

LDMFD SP!, {R1, LR} ; restore R1 and LR

exit MUL R0, R0, R1 ; answer builds up in R0

MOV PC, LR

main MOV R1, #input

MOV SP, #stack

MOV R0, #1

BL factorial