PES University, Bangalore



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**UE20CS252: Microprocessor and Computer Architecture**

**Assignment – Week 5**

**Last Date of Submission : 20th March 2022.**

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| **Sl #** | **Question** |
| **1** | Write a program in ARM7TDMI-ISA to multiply 2 matrices of order3. i.e., implement c[i][j]=c[i][j] + a[i][j] x b[i][j]. a. Use MLA instruction b. Use MUL instruction  **Code :**  .data  a: .word 1,2,3,4,5,6,7,8,9  b: .word 1,2,3,4,5,6,7,8,9  c: .word 0,0,0,0,0,0,0,0,0    .text  ldr r0,=a  ldr r1,=b  ldr r2,=c  mov r3,#0  mov r4,#0  mov r10,#3  mov r8,#0    loop1:  mla r11,r3,r10,r8  mov r11,r11,lsl #2  ldr r5,[r0,r11]  mla r12,r8,r10,r4  mov r12,r12,lsl #2  ldr r6,[r1,r12]  mul r11,r5,r6  add r9,r9,r11  add r8,r8,#1  cmp r8,#3  bne loop1  mla r12,r3,r10,r4  mov r12,r12,lsl #2  str r9,[r2,r12]  mov r8,#0  mov r9,#0  add r4,r4,#1  cmp r4,#3  bne loop1  swi 0x011  .end  **Screenshot :** |
| **2** | Write a program in ARM7TDMI-ISA to find the NORM of a square matrix of order n  **Code :**  .data  a: .word 1,2,3,4,5,6,7,8,9  b: .word 0,0,0  c: .word 0    .text  ldr r0,=a  ldr r1,=b  ldr r2,=c  mov r3,#0  mov r4,#0  mov r10,#3  mov r5,#0  mov r8,#0  sub r8,r8,#1  loop:  mla r11,r4,r10,r3  mov r11,r11,lsl #2  ldr r6,[r0,r11]  cmp r6,#0  mulmi r6,r8,r6  add r5,r5,r6  add r4,r4,#1  cmp r4,#3  bne loop  mov r7,r3,lsl #2  str r5,[r1,r7]  mov r4,#0  add r3,r3,#1  mov r5,#0  cmp r3,#3  bne loop    mov r3,#0  mov r4,#0  mov r5,#0  ldr r3,[r1,r4]    max:  add r4,r4,#4  ldr r6,[r1,r4]  cmp r3,r6  movlt r3,r6  add r5,r5,#1  cmp r5,#2  bne max    str r3,[r2]  swi 0x011    .end  **Screenshot :** |
| **3** | Write a program in ARM7TDMI-ISA to find the ROWSUM of a matrix  **Code :**  .data    a: .word 1,2,3,4,5,6,7,8,9  b: .word 0,0,0    .text  ldr r0,=a  ldr r1,=b  mov r2,#0  mov r3,#0  mov r10,#3  mov r4,#0    loop:  mla r11,r2,r10,r3  mov r11,r11,lsl #2  ldr r5,[r0,r11]  add r4,r4,r5  add r3,r3,#1  cmp r3,#3  bne loop    mov r6,r2,lsl #2  str r4,[r1,r6]  add r2,r2,#1  mov r3,#0  mov r4,#0  cmp r2,#3  bne loop    swi 0x011    .end  **Screenshot :** |
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