

**Department of Computer Science & Engineering**

**Microprocessor & Computer Architecture**

**MPCA-Laboratory/Assignment/Hands-on/Project**

**UE20CS252**

|  |  |
| --- | --- |
| **Sl. No** | **Programs** |
| **Week No.5** | 1. Write a program in ARM7TDMI-ISA to generate Fibonacci Series and store  them in an array.  2. Write a program in ARM7TDMI-ISA to find smallest number in an array of n  32 bit numbers. Display the element if found.  3. Write a program in ARM7TDMI-ISA to add 2 matrices of order3.  i.e., Implement c[i][j]= a[i][j] + b[i][j].  4. Write a program in ARM7TDMI-ISA to transfer a block of 256 words stored  at memory location X to memory location Y using Load Multiple and Store  Multiple instructions. The rate of transfer is 32 bytes.  **Student exercises:**  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  .DATA  A:.WORD 10,20,30,40,50,60,70,80,90  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 R5,#0  MOV R6,#0  MOV R7,#0  MOV R8,#0  LOOP:  LDR R3,[R0],#4  LDR R4,[R1],#12  MLA R8,R3,R4,R8  ADD R5,R5,#1  CMP R5,#3  BNE LOOP  STR R8,[R2],#4  BL L1  L1:  LDR R3,[R0,#-12]!  LDR R4,[R1,#-32]!  MOV R8,#0  MOV R5,#0  ADD R6,R6,#1  CMP R6,#3  BLT LOOP    LDR R3,[R0,#12]!  LDR R4,[R1,#-12]!  MOV R8,#0  MOV R5,#0  MOV R6,#0  ADD R7,R7,#1  CMP R7,#3  BNE LOOP  BNE LOOP  SWI 0X011  b. Use MUL instruction  .DATA  A:.WORD 10,20,30,40,50,60,70,80,90  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 R5,#0  MOV R6,#0  MOV R7,#0  MOV R8,#0  MOV R9,#0  LOOP:  LDR R3,[R0],#4  LDR R4,[R1],#12  MUL R8,R3,R4  ADD R9,R9,R8  ADD R5,R5,#1  CMP R5,#3  BNE LOOP  STR R9,[R2],#4  BL L1  L1:  LDR R3,[R0,#-12]!  LDR R4,[R1,#-32]!  MOV R8,#0  MOV R9,#0  MOV R5,#0  ADD R6,R6,#1  CMP R6,#3  BLT LOOP    LDR R3,[R0,#12]!  LDR R4,[R1,#-12]!  MOV R8,#0  MOV R9,#0  MOV R5,#0  MOV R6,#0  ADD R7,R7,#1  CMP R7,#3  BNE LOOP  SWI 0X011  2. Write a program in ARM7TDMI-ISA to find the NORM of a square matrix of  order n.  3. Write a program in ARM7TDMI-ISA to find the ROWSUM of a matrix.    .DATA  MATRIX:.WORD 1, 2, 3, 4, 5, 6, 7, 8, 9  R:.WORD 3  C:.WORD 3  ROWSUM:.WORD 0, 0, 0  .TEXT  LDR R0,=MATRIX  LDR R1,=R  LDR R2,=C  LDR R9,=ROWSUM    LDR R3,[R0]  LDR R4,[R1]  LDR R5,[R2]    MOV R6,#1  L1:  MOV R7,#1  MOV R8,#0  L2:  ADD R8,R8,R3    LDR R3,[R0,#4]!  ADD R7,R7,#1  CMP R7,R5  BLE L2  STR R8,[R9],#4  ADD R6,R6,#1  CMP R6,R4  BLE L1  SWI 0X011 |