Microprocessor and Computer Architecture (MPCA) Laboratory
UE20CS252 4th Semester,
Academic Year 2021-22

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Sriram R   Section : H   SRN : PES1UG20CS435

Week # 1   **Program Number: 1**

Title of the Program

Write a program in ARM7TDMI-ISA to copy a block of N data items from Location A to Location B using half words.

Program Code

```
.DATA

        A: .HWORD 10,20,30,40,50,60,70,80,90,100
        B: .HWORD 0,0,0,0,0,0,0,0,0,0,0

.TEXT

        LDR R1, =A
        LDR R2, =B
        MOV R5, #1; count register initialization to 1

L1:     LDRH R3, [R1]
        STRH R3, [R2]
```
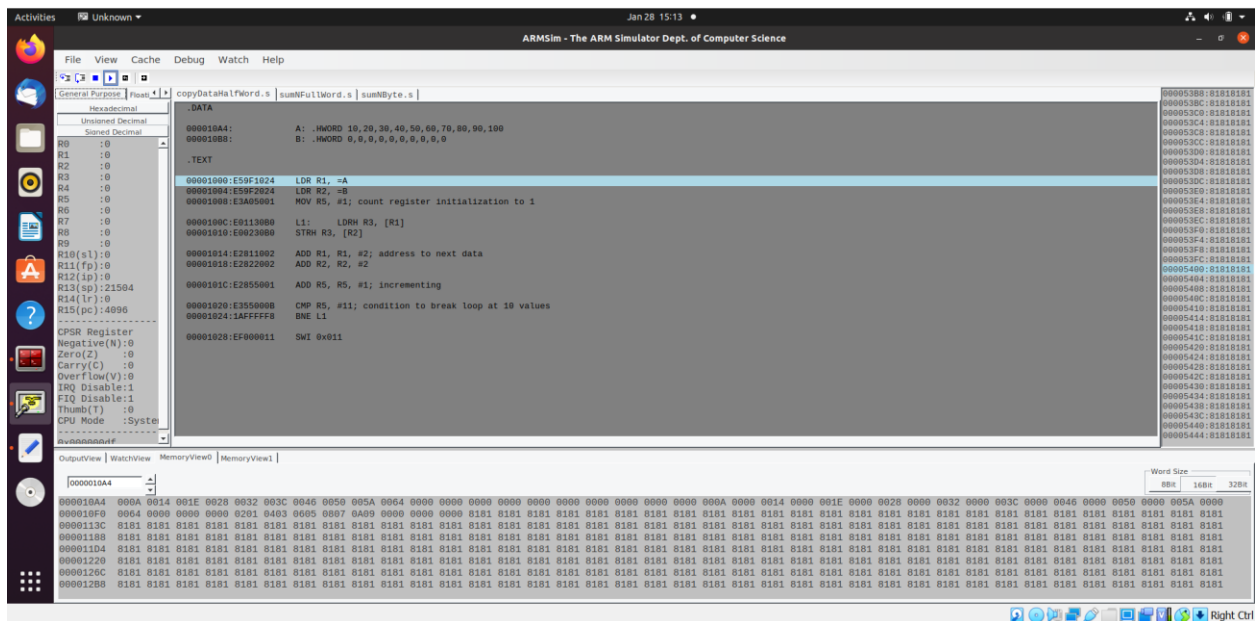
ADD R1, R1, #2; address to next data
ADD R2, R2, #2

ADD R5, R5, #1; incrementing

CMP R5, #11; condition to break loop at 10 values
BNE L1

SWI 0x011

Screenshot of ArmSimulator of the Program Executed

Title of the Program

Write a program in ARM7TDMI-ISA to find the sum of N data items in the memory using full words.

Program Code

```
.DATA

        A:  .WORD 10,20,30,40,50,60,70,80,90,100
        SUM:  .WORD 0

.TEXT

        LDR R1, =A
        LDR R2, =SUM

        MOV R4, #0; sum register
        MOV R5, #1; count register

L1:     LDR R3, [R1]
        ADD R4, R4, R3
        ADD R1, R1, #4
        ADD R5, R5, #1
        CMP R5, #11
        BNE L1

        STR R4,[R2]
        SWI 0X011
```
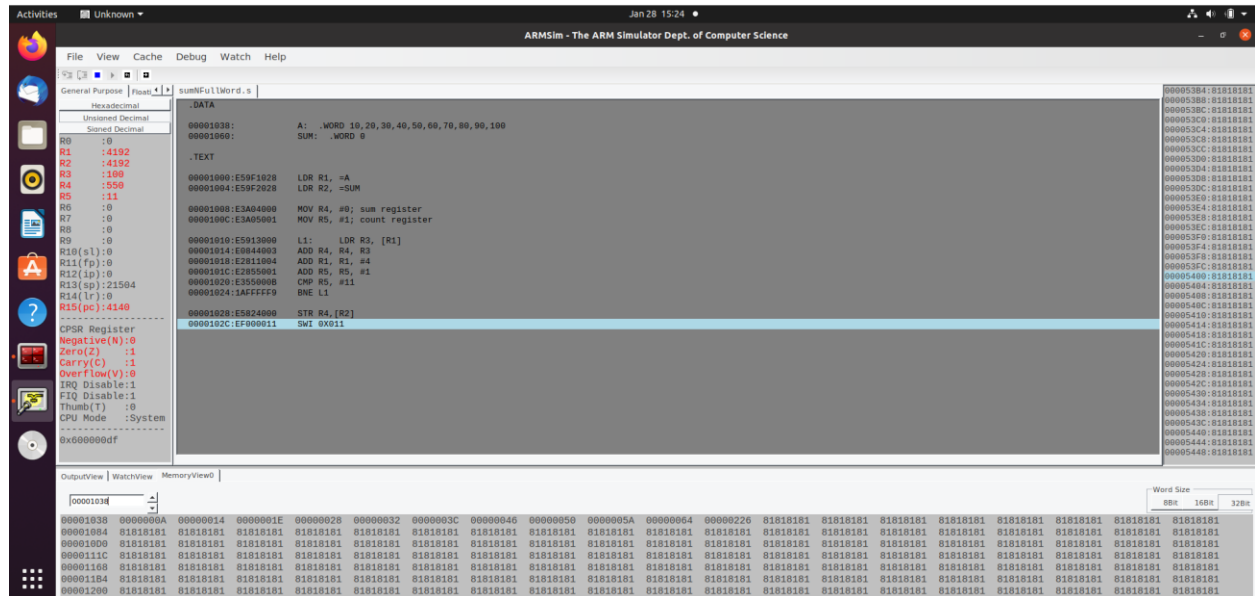
Screenshot of ArmSimulator of the Program Executed

Week # 1   **Program Number: 3**

Title of the Program

Write a program in ARM7TDMI-ISA to find the sum of N data items in the memory using bytes.

Program Code

```
.DATA
      A: .BYTE 1,2,3,4,5,6,7,8,9,10
      SUM: .WORD 0

.TEXT

      LDR R1, =A
      LDR R2, =SUM

      MOV R4, #0
      MOV R5, #1

L1:   LDRB R3, [R1]
      ADD R4, R4, R3
      ADD R1, R1, #1
      ADD R5, R5, #1
      CMP R5, #11
      BNE L1

      STRB R4,[R2]
      SWI 0X011
```
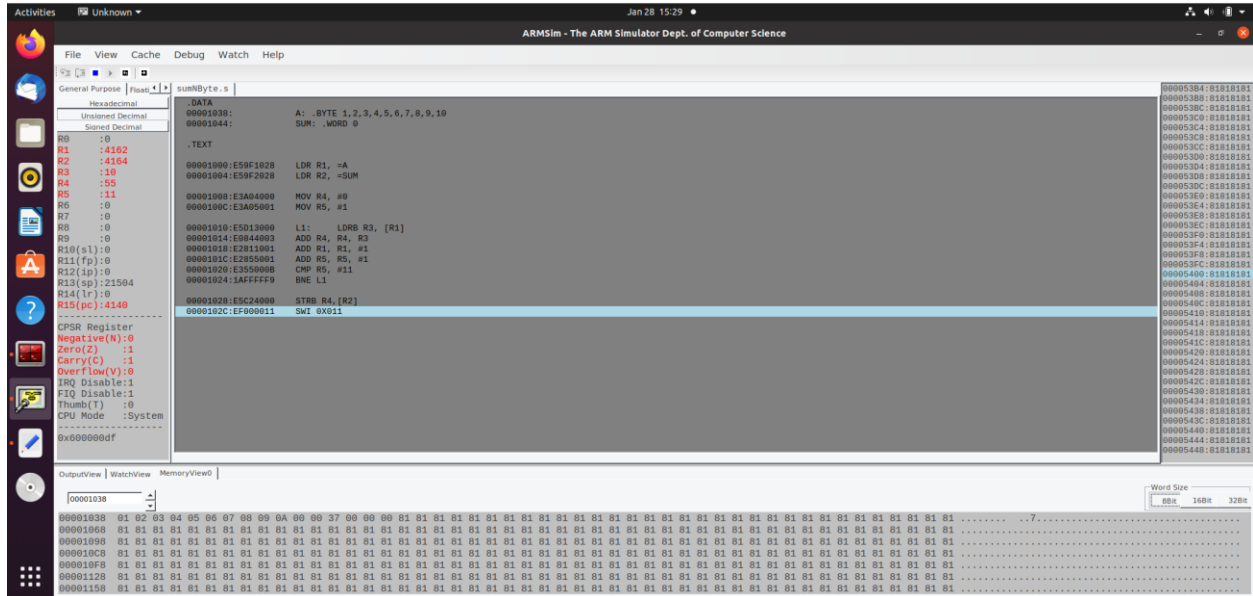
Screenshot of ArmSimulator of the Program Executed

Title of the Program

Write a program in ARM7TDMI-ISA to find the sum of N natural numbers using full words.

Program Code

```
.DATA

      SUM: .WORD 0

.TEXT

      LDR R2, =SUM
      MOV R1, #1 ; count doubles up as natural number generator

L1:   ADD R0, R0, R1; performs addition
      ADD R1, R1, #1; increments by 1
      CMP R1, #11
      BNE L1

      STR R0, [R2]
      SWI 0X011
```

Screenshot of ArmSimulator of the Program Executed