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

**Date: 28/01/2022**

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| Name : SUNDEEP A | SRN: PES1UG20CS445 |
| SEC: H | ROLL NO : 48 |

**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 B(do not use LDM/STM). For half word

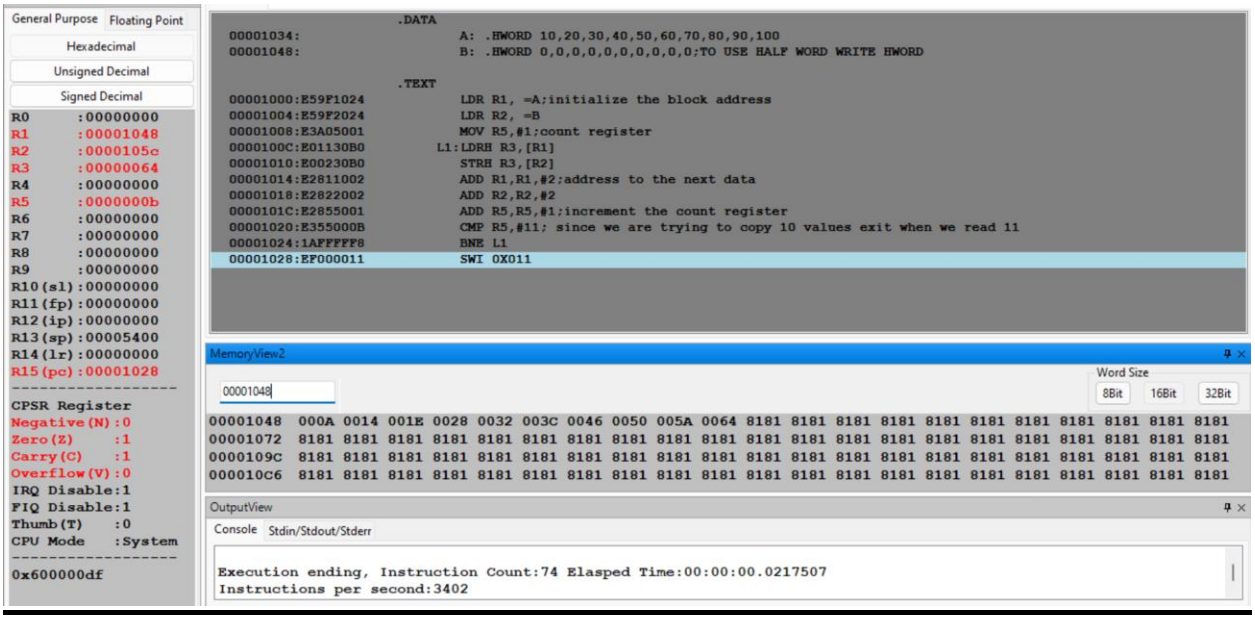
## Program Code

```
.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

.TEXT
        LDR R1, =A; initialize the block address
        LDR R2, =B
        MOV R5,#1;count register
    L1:LDRH R3,[R1]
        STRH R3,[R2]
        ADD R1,R1,#2;address to the next data
        ADD R2,R2,#2
        ADD R5,R5,#1;increment the count register
        CMP R5,#11; since we are trying to copy 10 values exit when we read 11
```

BNE L1
SWI 0X011

## Screenshot of ArmSimulator of the Program Executed




## Program Number: 2

## Title of the Program

Write a program in ARM7TDMI-ISA to find the sum of N data items in the memory. State the result in the memory locations

a) For full word
b) For byte

## Program Code

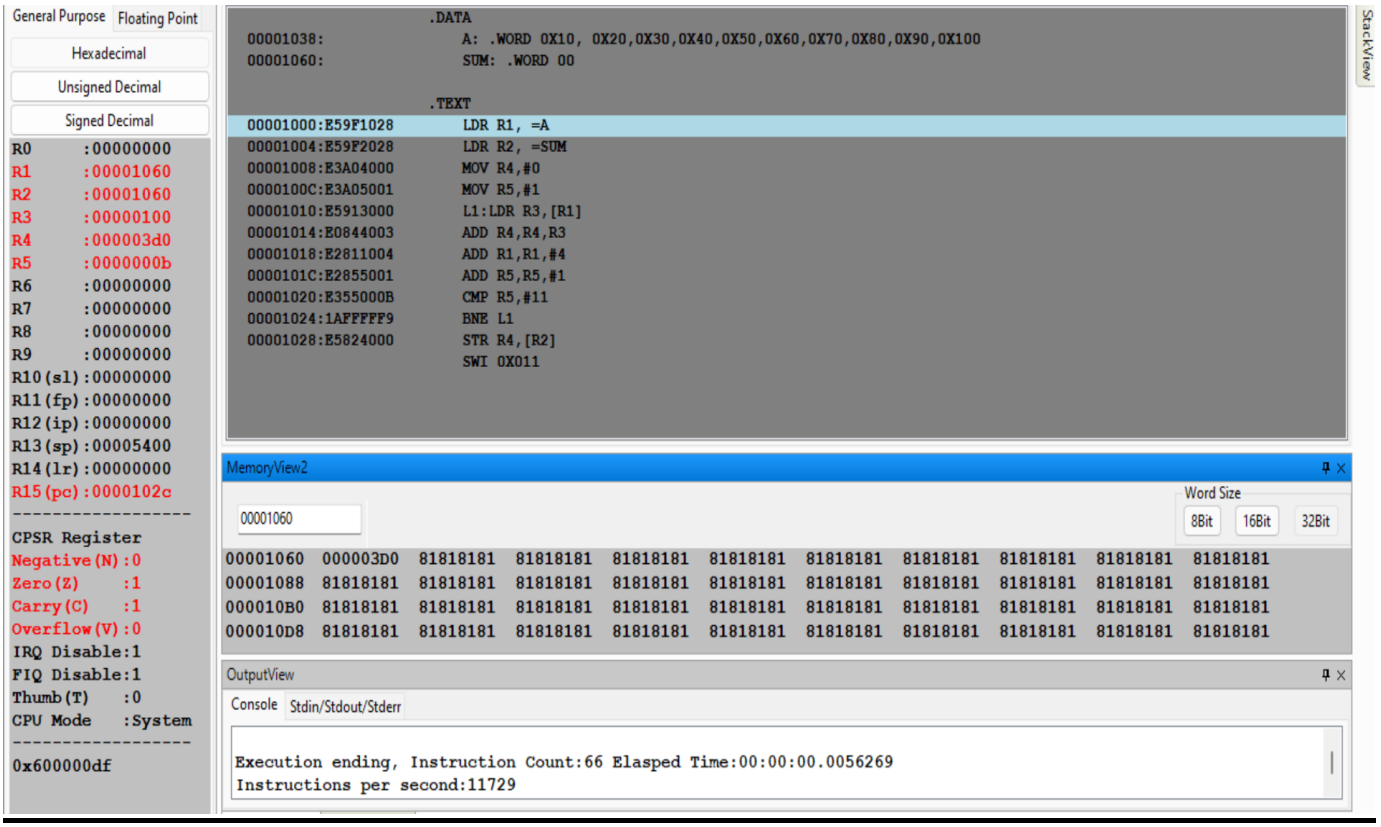
### a) Full word

```
.DATA
   A: .WORD 0X10, 0X20,0X30,0X40,0X50,0X60,0X70,0X80,0X90,0X100
   SUM: .WORD 00

.TEXT
   LDR R1, =A
   LDR R2, =SUM
   MOV R4,#0
```

```
MOV R5,#1
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




## Program Code

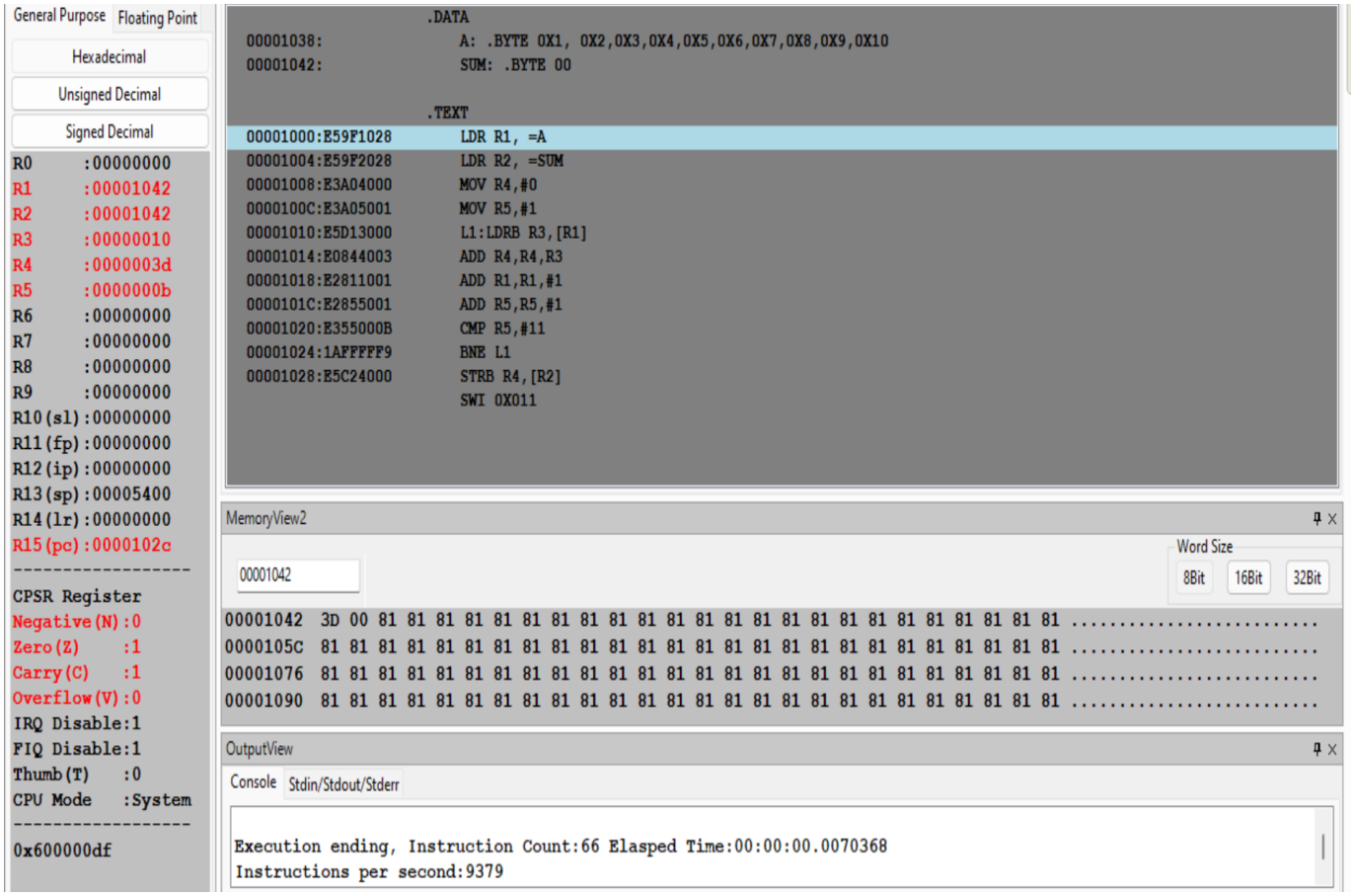
### b) Byte

```
.DATA
   A: .BYTE 0X1, 0X2,0X3,0X4,0X5,0X6,0X7,0X8,0X9,0X10
   SUM: .BYTE 00

.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




## Program Number: 3

## Title of the Program

Write a program in ARM7TDMI-ISA to find the sum of N natural numbers. Store the result in the memory location. Using Full Word.

# Program Code

```
.DATA
   A: .WORD 15,25,35,45,55,65,75,50,95,105,115,125,135,145
   SUM: .WORD 00

.TEXT
   LDR R1, =A
   LDR R2, =SUM
   MOV R4,#0
   MOV R5,#1
   L1:LDR R3,[R1]
   ADD R4,R4,R3
   ADD R1,R1,#4
   ADD R5,R5,#1
   CMP R5,#15
   BNE L1
   STR R4,[R2]
   SWI 011
```

# Screenshot of ArmSimulator of the Program Executed