



Department of Computer Science & Engineering
Microprocessor & Computer Architecture
MPCA-Laboratory/Assignment/Hands-on/Project
UE20CS252

Sl. No	Programs
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Week No.2	
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1. Write a program in ARM7TDMI-ISA to copy a block of N data items from Location A to Location B.

a. Use Half word (.Hword directive)

The screenshot shows the ARMSim simulator interface. The main window displays assembly code for an ARM7TDMI processor. The code includes data definitions for locations A and B, and a loop that copies data from A to B using half-word instructions. The registers view on the left shows the current state of the registers, and the memory view at the bottom shows the contents of memory locations.

```
.DATA
00001034: A: .HWORD 10,20,30,40,50
0000103E: B: .HWORD 0,0,0,0,0

.TEXT
00001000:E59F1024 LDR R1,=A
00001004:E59F2024 LDR R2,=B
00001008:E3A04000 MOV R4,#0 ;COUNTER

0000100C:E0113080 LOOP:LDRH R3,[R1]
00001010:E0023080 STRH R3,[R2]
00001014:E2811002 ADD R1,R1,#2
00001018:E2822002 ADD R2,R2,#2
0000101C:E2844001 ADD R4,R4,#1
00001020:E354000A CMP R4,#10
00001024:1AFFFFF9 BNE LOOP
00001028:EF000011 SWI 0X011

0000102C:00001034 .END
00001030:0000103E
```

Registers View:

Register	Value
R0	00000000
R1	00001048
R2	00001052
R3	00000032
R4	0000000A
R5	00000000
R6	00000000
R7	00000000
R8	00000000
R9	00000000
R10 (s1)	00000000
R11 (fp)	00000000
R12 (ip)	00000000
R13 (sp)	00005400
R14 (lr)	00000000
R15 (pc)	00001029

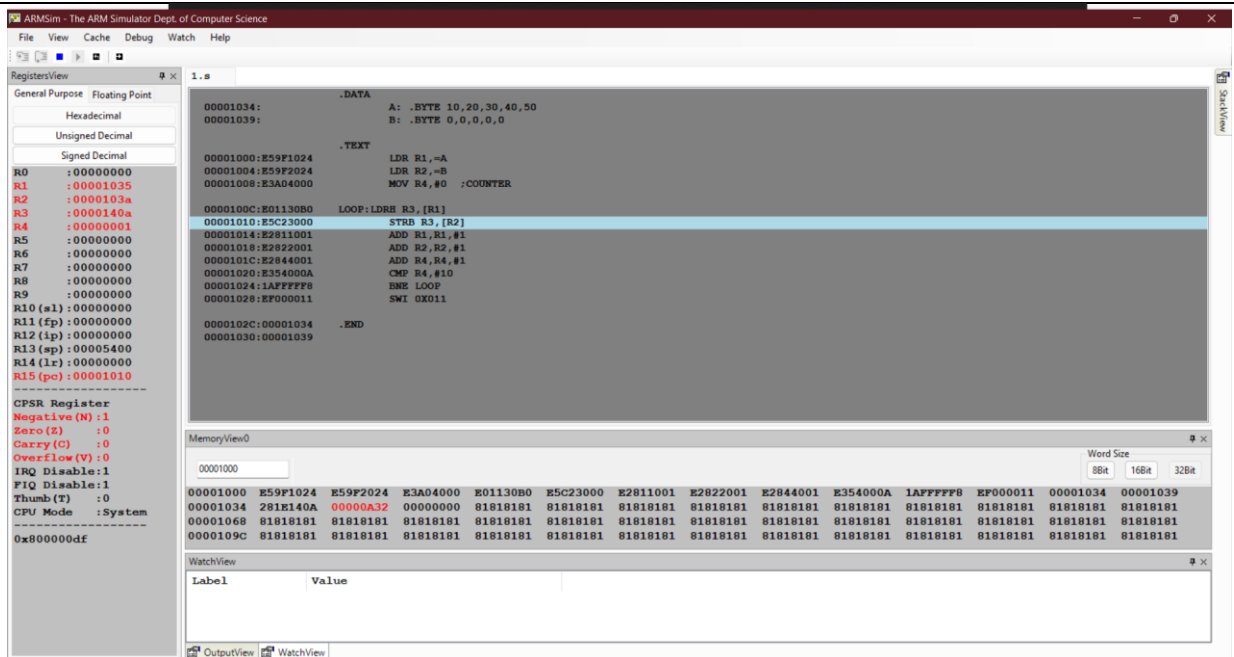
CPSR Register:

Field	Value
Negative (N)	0
Zero (Z)	1
Carry (C)	1
Overflow (V)	0
IRQ Disable	1
FIQ Disable	1
Thumb (T)	0
CPU Mode	System

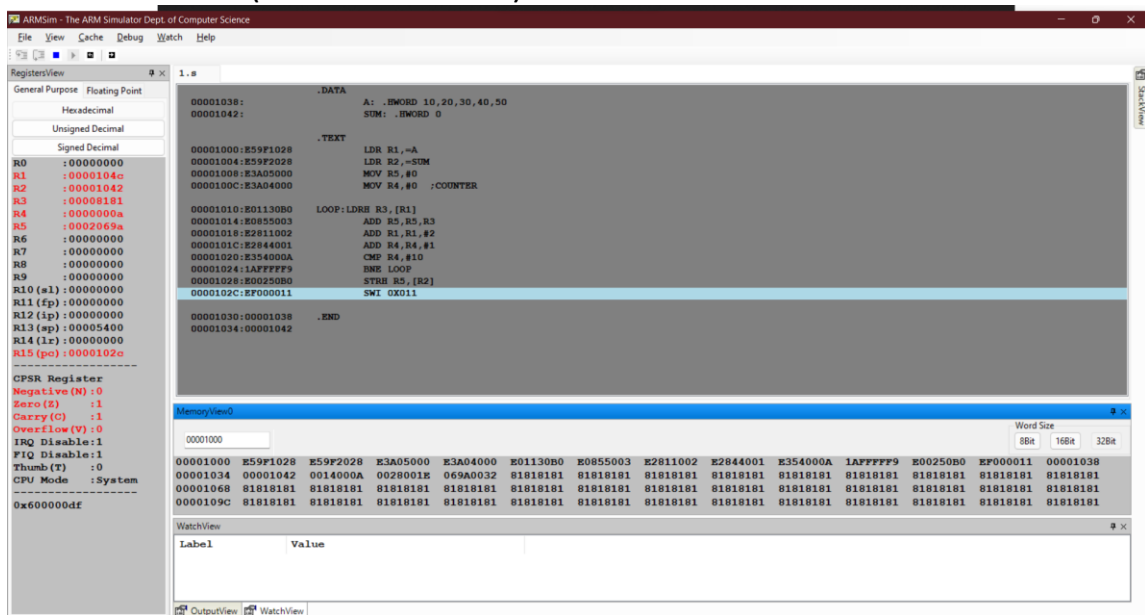
Memory View:

Address	Value
00001000	E59F1024
00001004	E59F2024
00001008	E3A04000
0000100C	E0113080
00001010	E0023080
00001014	E2811002
00001018	E2822002
0000101C	E2844001
00001020	E354000A
00001024	1AFFFFF9
00001028	EF000011
00001034	00001034
0000103E	0000103E

b. Use Byte wise (.Byte directive)



2. Write a program in ARM7TDMI-ISA to find the sum of N data items in the memory. Store the result in the memory location.
 - a. Use Half word (.Hword directive)



- b. Use Byte wise (.Byte directive)

ARMsim - The ARM Simulator Dept. of Computer Science

File View Cache Debug Watch Help

RegistersView 1.s

General Purpose Floating Point

Hexadecimal
Unsigned Decimal
Signed Decimal

R0 : 00000000
R1 : 0000104c
R2 : 0000103e
R3 : 00008181
R4 : 0000000a
R5 : 00034560
R6 : 00000000
R7 : 00000000
R8 : 00000000
R9 : 00000000
R10 (s1) : 00000000
R11 (fp) : 00000000
R12 (ip) : 00000000
R13 (sp) : 00005400
R14 (lr) : 00000000
R15 (pc) : 0000102c

CPSR Register
Negative (N) : 0
Zero (Z) : 1
Carry (C) : 1
Overflow (V) : 0
IRQ Disable : 1
FIQ Disable : 1
Thumb (T) : 0
CPU Mode : System
0x600000df

.DATA
00001038: A: .BYTE 10,20,30,40,50
0000103E: SUM: .HWORD 0

.TEXT
00001000:E59F1028 LDR R1,=A
00001004:E59F2028 LDR R2,=SUM
00001008:E3A05000 MOV R5,#0
0000100C:E3A04000 MOV R4,#0 ;COUNTER

00001010:E01130B0 LOOP:LDRH R3,[R1]
00001014:E0855003 ADD R5,R5,R3
00001018:E2811002 ADD R1,R1,#2
0000101C:E2844001 ADD R4,R4,#1
00001020:E354000A CMP R4,#10
00001024:1AFFFFF9 BNE LOOP
00001028:E00250B0 STRH R5,[R2]
0000102C:EF000011 SWI 0x011

00001030:00001038 .END
00001034:0000103E

MemoryView0

00001000

Word Size
8Bit 16Bit 32Bit

00001000	E59F1028	E59F2028	E3A05000	E3A04000	E01130B0	E0855003	E2811002	E2844001	E354000A	1AFFFFF9	E00250B0	EF000011	00001038
00001034	0000103E	281E140A	45600032	81818181	81818181	81818181	81818181	81818181	81818181	81818181	81818181	81818181	81818181
00001068	81818181	81818181	81818181	81818181	81818181	81818181	81818181	81818181	81818181	81818181	81818181	81818181	81818181
0000109C	81818181	81818181	81818181	81818181	81818181	81818181	81818181	81818181	81818181	81818181	81818181	81818181	81818181

WatchView

Label	Value
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OutputView WatchView

