Microprocessor and Computer Architecture Laboratory

UE21CS251B

4th Semester, Academic Year 2022-23

Date:31-MARCH-2023

Name: NAGAVENI L G	SRN: PES2UG21CS315	Section: F

Week#____5_____ Program Number:_____1_

Write an ALP to read from a 2D array such that

B=a[i] [j]

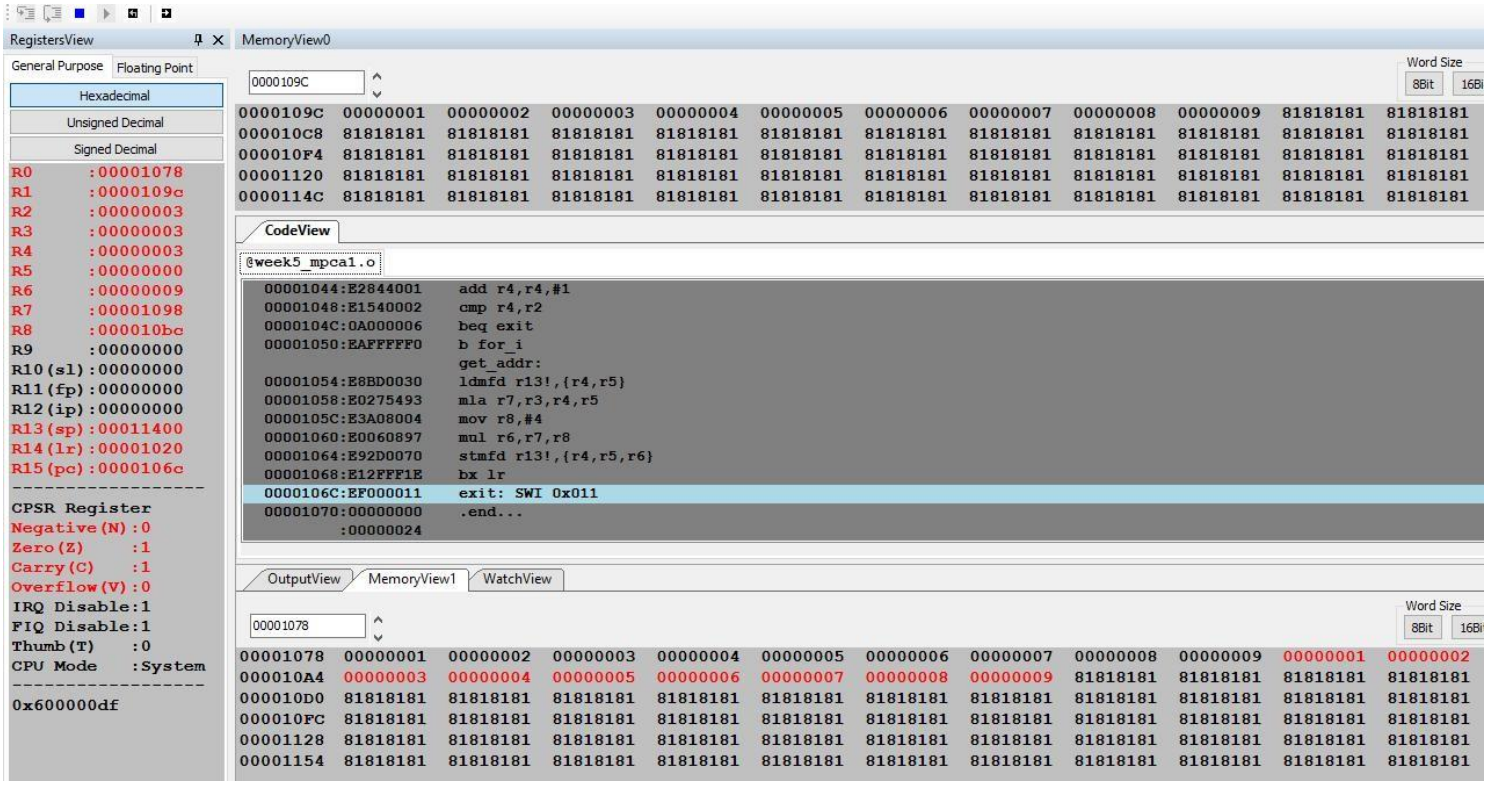
I. ARM Assembly Code (1).
II. Output Screen Shot (One Example of your choice)
III. Output Table for the program(1)

CODE:

```
.data
a:.word 1,2,3
  .word 4,5,6
  .word 7,8,9
b: .word 0
.text
ldr r0, =a
ldr r1,=b
mov r2,#3 @rows
mov r3,#3 @columns
mov r4,#0 @i
mov r5,#0 @j
loop:
stmfd r13!,{r4,r5}
bl get_addr
ldmfd r13!,{r4,r5,r6}
add r7,r0,r6
add r8,r1,r6
```

```
ldr r6,[r7]
str r6,[r8]
add r5,r5,#1
cmp r5,r3
bne loop
mov r5,#0
add r4,r4,#1
cmp r4,r2
beq exit
b loop
get_addr:
ldmfd r13!,{r4,r5}
mla r7,r3,r4,r5
mov r8,#4
mul r6,r7,r8
stmfd r13!,{r4,r5,r6}
bx lr
exit: SWI 0x011
.end
```

OUTPUT:



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UE21CS251B

4th Semester, Academic Year 2022-23

Date:31-MARCH-2023

Name: NAGAVENI L G	SRN: PES2UG21CS315	Section: F

Week#____5_____ Program Number:_____2_

Write an ALP to implement C[k]=A[i]+B[j]

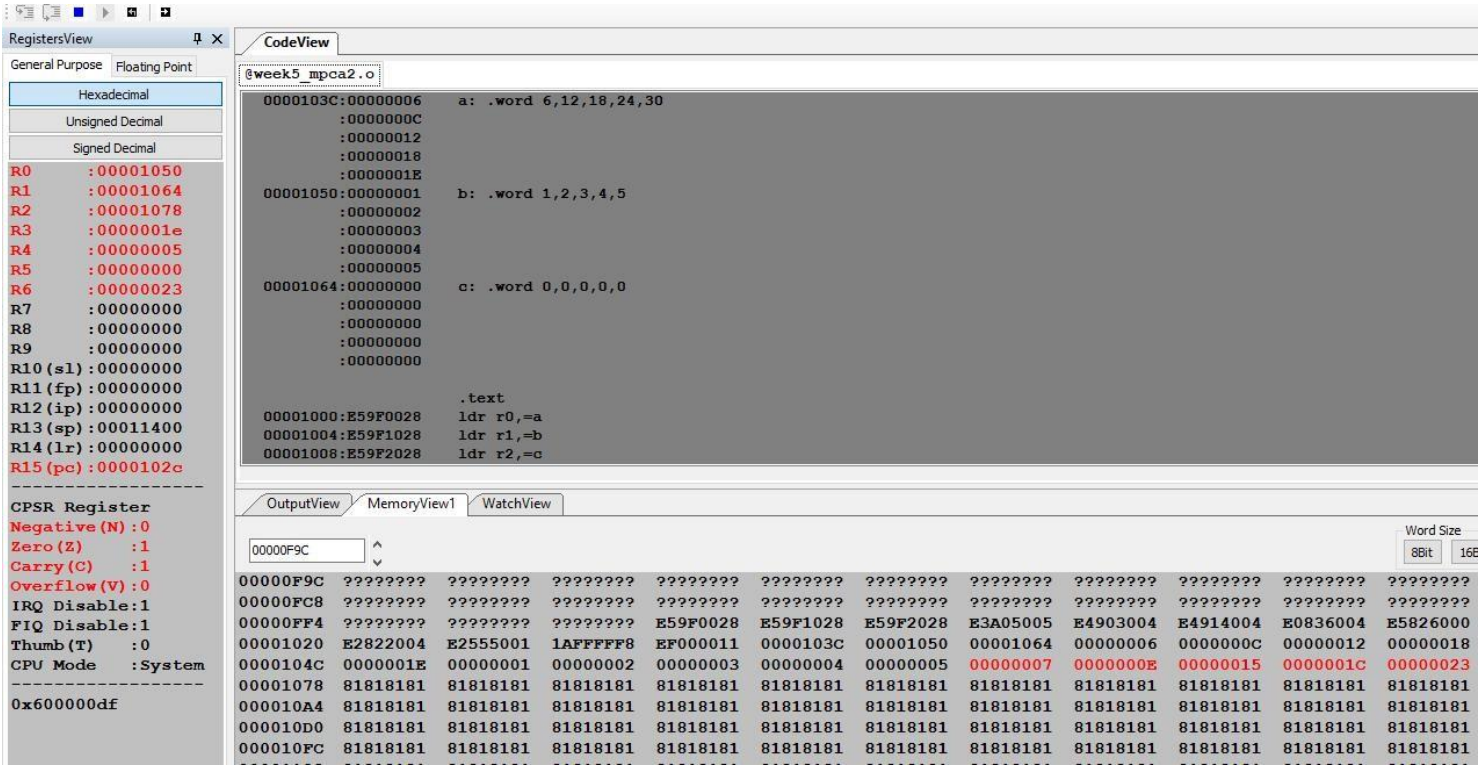
I. ARM Assembly Code (1).
II. Output Screen Shot (One Example of your choice)
III. Output Table for the program(1)

CODE:

```
.data
a: .word 6,12,18,24,30
b: .word 1,2,3,4,5
c: .word 0,0,0,0,0

.text
ldr r0,=a
ldr r1,=b
ldr r2,=c
mov r5,#5
loop:ldr r3,[r0],#4
ldr r4,[r1],#4
add r6,r3,r4
str r6,[r2]
add r2,r2,#4
subs r5,r5,#1
bne loop
swi 0x11
.end
```

OUTPUT:


RegistersView
General Purpose
Floating Point
Hexadecimal
Unsigned Decimal
Signed Decimal
R0 :00001050
R1 :00001064
R2 :00001078
R3 :0000001e
R4 :00000005
R5 :00000000
R6 :00000023
R7 :00000000
R8 :00000000
R9 :00000000
R10(sl):00000000
R11(fp):00000000
R12(ip):00000000
R13(sp):00011400
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
CodeView
@week5_mpca2.o
0000103C:00000006 a: .word 6,12,18,24,30
:0000000C
:00000012
:00000018
:0000001E
00001050:00000001 b: .word 1,2,3,4,5
:00000002
:00000003
:00000004
:00000005
00001064:00000000 c: .word 0,0,0,0,0
:00000000
:00000000
:00000000
:00000000
.text
00001000:E59F0028 ldr r0,=a
00001004:E59F1028 ldr r1,=b
00001008:E59F2028 ldr r2,=c
OutputView
MemoryView1
WatchView
00000F9C
Word Size
8Bit
00000F9C ???????? ???????? ???????? ???????? ???????? ???????? ???????? ???????? ???????? ???????? ????????
00000FC8 ???????? ???????? ???????? ???????? ???????? ???????? ???????? ???????? ???????? ???????? ????????
00000FF4 ???????? ???????? ???????? E59F0028 E59F1028 E59F2028 E3A05005 E4903004 E4914004 E0836004 E5826000
00001020 E2822004 E2555001 1AFFFFF8 EF000011 0000103C 00001050 00001064 00000006 0000000C 00000012 00000018
0000104C 0000001E 00000001 00000002 00000003 00000004 00000005 00000007 0000000E 00000015 0000001C 00000023
00001078 81818181 81818181 81818181 81818181 81818181 81818181 81818181 81818181 81818181 81818181 81818181
000010A4 81818181 81818181 81818181 81818181 81818181 81818181 81818181 81818181 81818181 81818181 81818181
000010D0 81818181 81818181 81818181 81818181 81818181 81818181 81818181 81818181 81818181 81818181 81818181
000010FC 81818181 81818181 81818181 81818181 81818181 81818181 81818181 81818181 81818181 81818181 81818181

. **Microprocessor and Computer Architecture Laboratory**

UE21CS251B

4th Semester, Academic Year 2022-23

Date:31-MARCH-2023

Name: NAGAVENI L G	SRN: PES2UG21CS315	Section: F

Week#____5_____ Program Number:_____3_

Write an ALP to implement Sum[i] +=a[i][j]

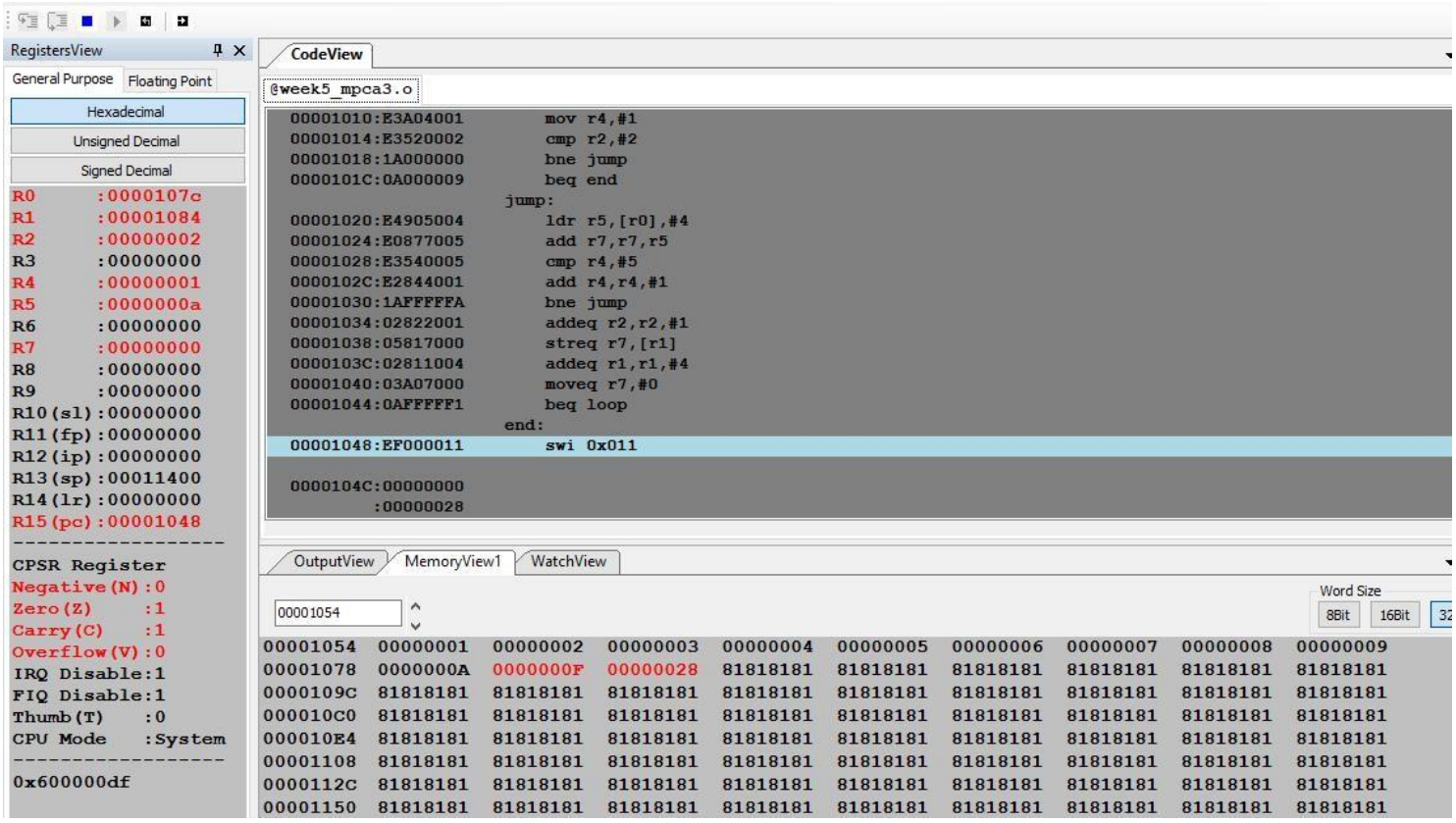
I. ARM Assembly Code (1).
II. Output Screen Shot (One Example of your choice)
III. Output Table for the program(1)

CODE:

```
.data
a: .word 1,2,3,4,5
   .word 6,7,8,9,10
sum: .word 0
     .word 0
.text
ldr r0,=a
ldr r1,=sum
mov r2,#0
mov r7,#0
loop:
    mov r4,#1
    cmp r2,#2
    bne jump
    beq end
jump:
    ldr r5,[r0],#4
    add r7,r7,r5
    cmp r4,#5
    add r4,r4,#1
    bne jump
```

```
    addeq r2,r2,#1
    streq r7,[r1]
    addeq r1,r1,#4
    moveq r7,#0
    beq loop
end:
    swi 0x011
```

OUTPUT:



Microprocessor and Computer Architecture Laboratory

UE21CS251B

4th Semester, Academic Year 2022-23

Date:31-MARCH-2023

Name: NAGAVENI L G	SRN: PES2UG21CS315	Section: F

Week#____5_____ Program Number:_____4_

Write an ALP to implement c[k] = a[i] * b[j]

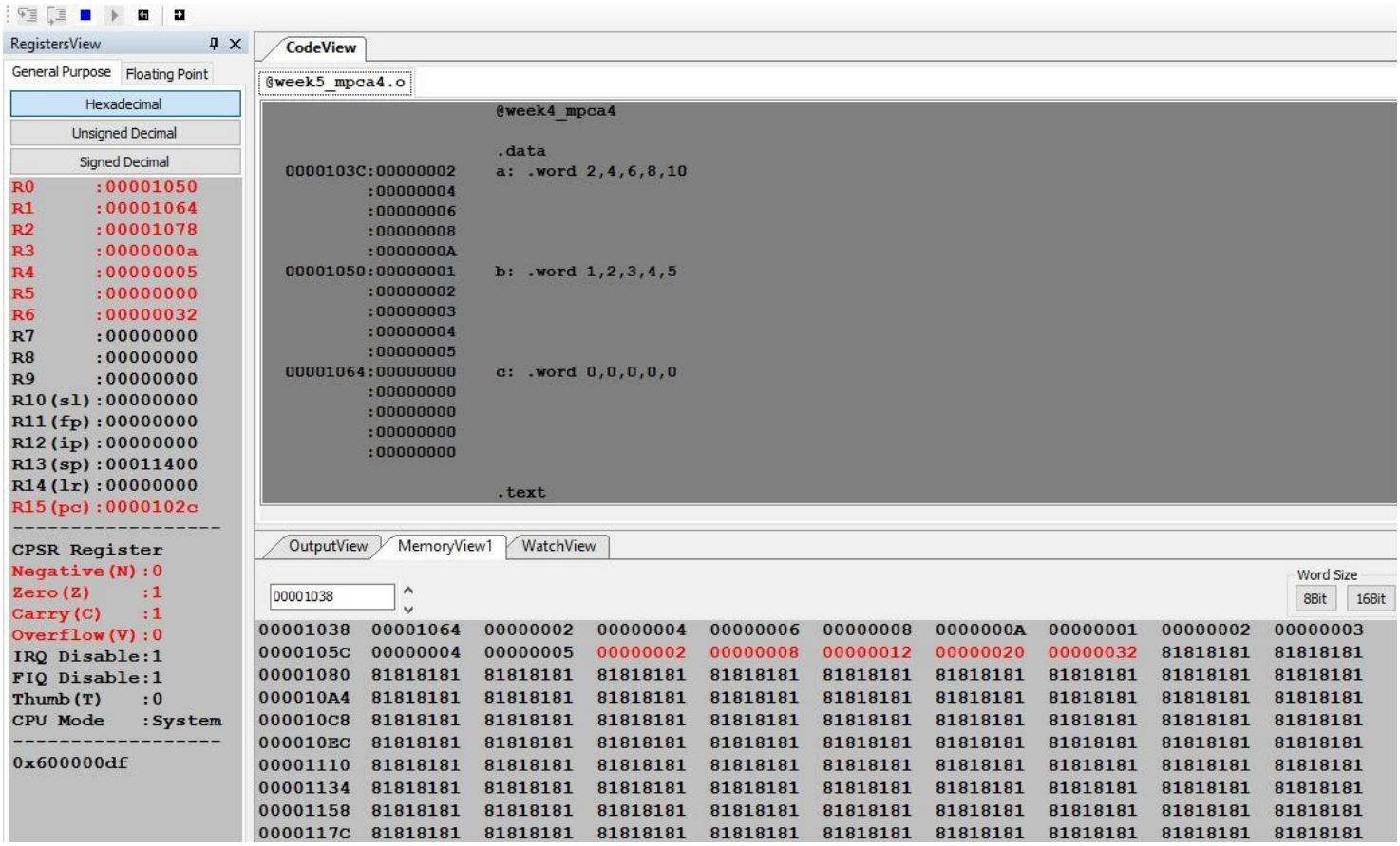
I. ARM Assembly Code (1).
II. Output Screen Shot (One Example of your choice)
III. Output Table for the program(1)

CODE:

```
.data
a: .word 2,4,6,8,10
b: .word 1,2,3,4,5
c: .word 0,0,0,0,0

.text
ldr r0,=a
ldr r1,=b
ldr r2,=c
mov r5,#5
loop:ldr r3,[r0],#4
ldr r4,[r1],#4
mul r6,r3,r4
str r6,[r2]
add r2,r2,#4
subs r5,r5,#1
bne loop
swi 0x11
.end
```

OUTPUT:


RegistersView
General Purpose
Floating Point
Hexadecimal
Unsigned Decimal
Signed Decimal
R0 :00001050
R1 :00001064
R2 :00001078
R3 :0000000a
R4 :00000005
R5 :00000000
R6 :00000032
R7 :00000000
R8 :00000000
R9 :00000000
R10(sl):00000000
R11(fp):00000000
R12(ip):00000000
R13(sp):00011400
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
CodeView
@week5_mpca4.o
@week4_mpca4
.data
0000103C:00000002 a: .word 2,4,6,8,10
:00000004
:00000006
:00000008
:0000000A
00001050:00000001 b: .word 1,2,3,4,5
:00000002
:00000003
:00000004
:00000005
00001064:00000000 c: .word 0,0,0,0,0
:00000000
:00000000
:00000000
:00000000
.text
OutputView
MemoryView1
WatchView
00001038
Word Size
8Bit
16Bit
00001038 00001064 00000002 00000004 00000006 00000008 0000000A 00000001 00000002 00000003
0000105C 00000004 00000005 00000002 00000008 00000012 00000020 00000032 81818181 81818181
00001080 81818181 81818181 81818181 81818181 81818181 81818181 81818181 81818181 81818181
000010A4 81818181 81818181 81818181 81818181 81818181 81818181 81818181 81818181 81818181
000010C8 81818181 81818181 81818181 81818181 81818181 81818181 81818181 81818181 81818181
000010EC 81818181 81818181 81818181 81818181 81818181 81818181 81818181 81818181 81818181
00001110 81818181 81818181 81818181 81818181 81818181 81818181 81818181 81818181 81818181
00001134 81818181 81818181 81818181 81818181 81818181 81818181 81818181 81818181 81818181
00001158 81818181 81818181 81818181 81818181 81818181 81818181 81818181 81818181 81818181
0000117C 81818181 81818181 81818181 81818181 81818181 81818181 81818181 81818181 81818181

Microprocessor and Computer Architecture Laboratory

UE21CS251B

4th Semester, Academic Year 2020-21

Date:31-MARCH-2023

Name: NAGAVENI L G	SRN: PES2UG21CS315	Section: F

Week#____5_____ Program Number:_____5_

Write an ALP to implement C[i][j]=a[i][j]+b[i][j]

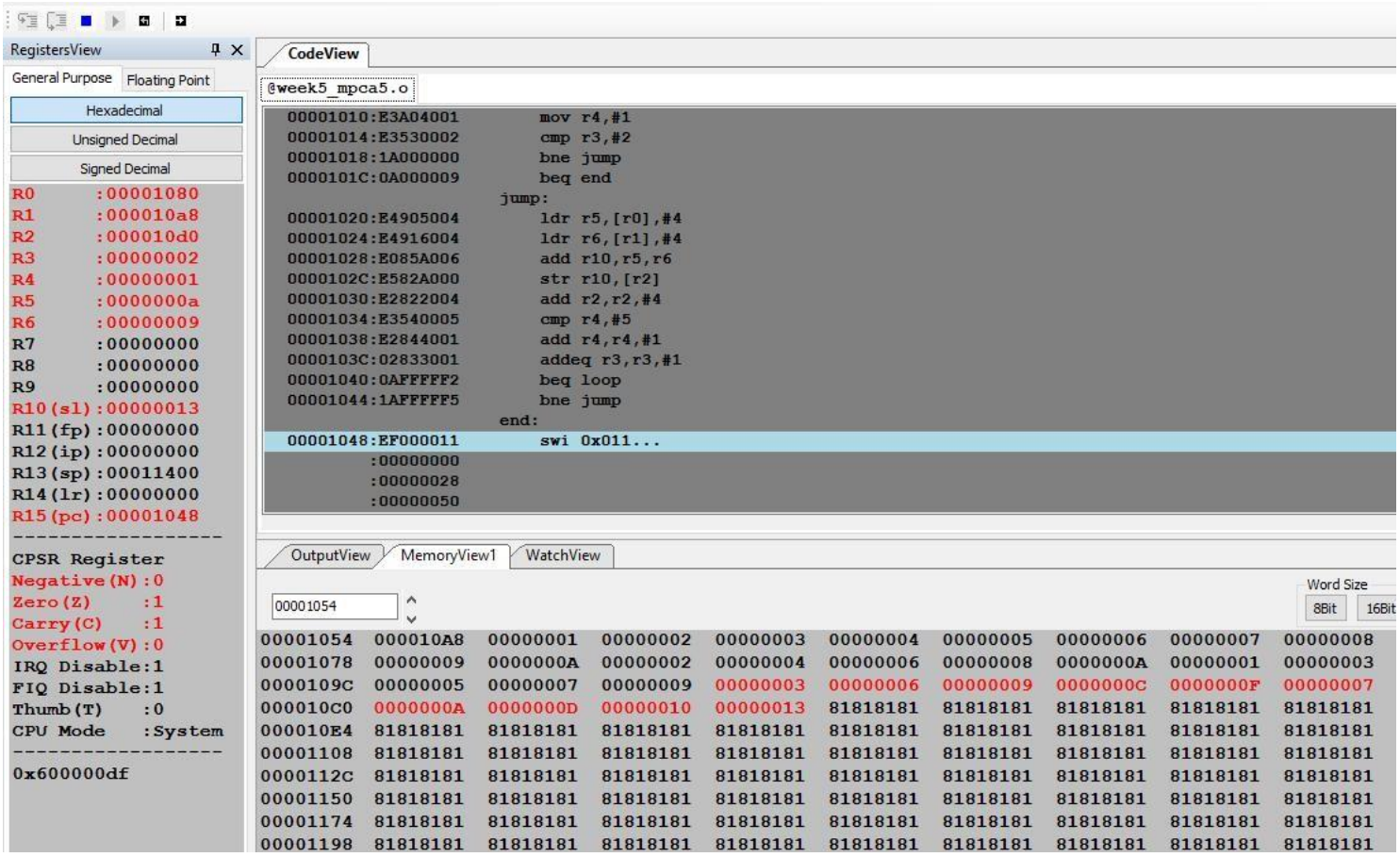
1. ARM Assembly Code (1).
2. Output Screen Shot (One Example of your choice)
3. Output Table for the program(1)

CODE:

```
.data
a: .word 1,2,3,4,5
   .word 6,7,8,9,10
b: .word 2,4,6,8,10
   .word 1,3,5,7,9
c: .word 0,0,0,0,0
   .word 0,0,0,0,0
.text
ldr r0,=a
ldr r1,=b
ldr r2,=c
mov r3,#0
loop:
    mov r4,#1
    cmp r3,#2
    bne jump
    beq end
jump:
    ldr r5,[r0],#4
```

```
    ldr r6,[r1],#4
    add r10,r5,r6
    str r10,[r2]
    add r2,r2,#4
    cmp r4,#5
    add r4,r4,#1
    addeq r3,r3,#1
    beq loop
    bne jump
end:
    swi 0x011
```

OUTPUT:



Disclaimer:

- The programs and output submitted is duly written, verified and executed by me.
- I have not copied from any of my peers nor from the external resource such as internet.
- If found plagiarized, I will abide with the disciplinary action of the University.

Signature: Nagaveni
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SRN: PES2UG21CS315
Section: F
Date: 31-MARCH-2023