MPCA ASSIGNMENT - 1

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SECTION: B

ROLL NO :1

Problem 1:

Write a program in ARM7 TDMI ISA to search for an element in an array. Display app messages on the standard device. Successful search should display “Search is successful”. Unsuccessful search should display “search is unsuccessful”. Use binary search technique.

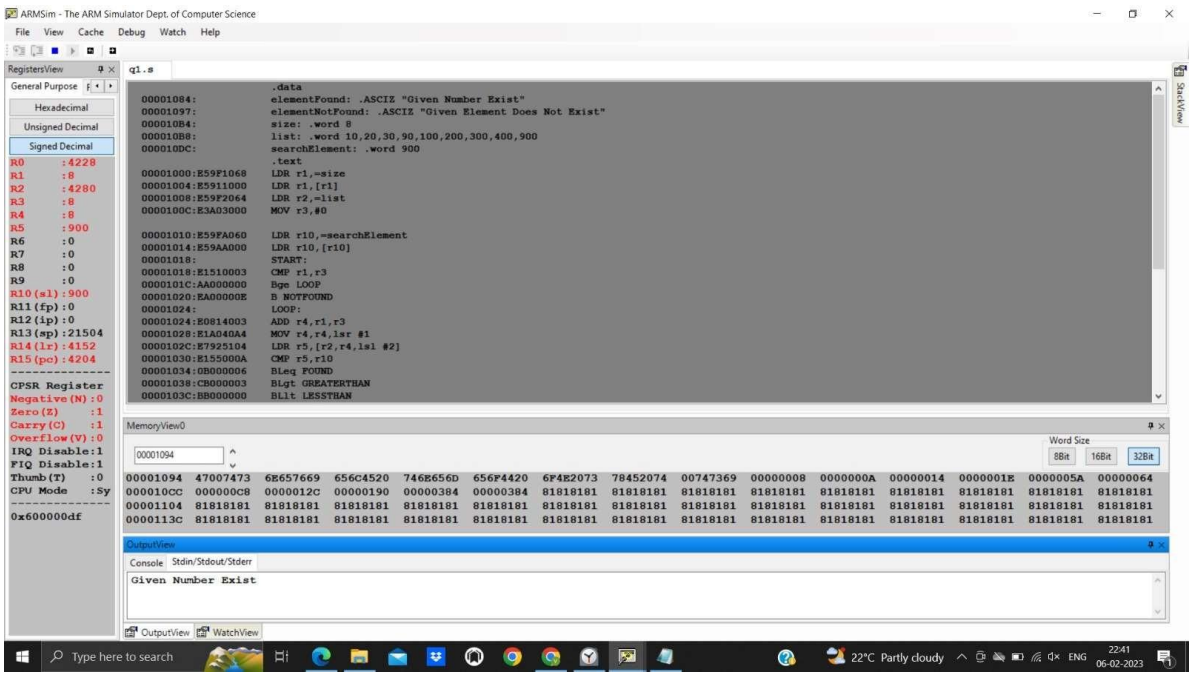
CODE:

```
.data
elementFound: .ASCIZ "Given Number Exist" elementNotFound:
.ASCIZ "Given Element Does Not Exist" size: .word 8
list: .word 10,20,30,90,100,200,300,400,900 searchElement: .word
900
.text
LDR r1,=size
LDR r1,[r1]
LDR r2,=list
MOV r3,#0
```

```
LDR r10,=searchElement
LDR r10,[r10]
START:
   CMP r1,r3
   Bge LOOP     B
NOTFOUND
LOOP:
   ADD r4,r1,r3
   MOV r4,r4,lsr #1
   LDR r5,[r2,r4,lsl #2]
   CMP r5,r10
   BLeq FOUND
   BLgt GREATERTHAN
   BLlt LESSTHAN
   B START
LESSTHAN:
   ADD r3,r4,#1
   MOV pc,lr
GREATERTHAN:
   SUB r1,r4,#1
   MOV PC,LR FOUND:
   LDR r0,=elementFound
   SWI 0x02
   B EXIT
```

```
NOTFOUND:
    LDR r0,=elementNotFound
    SWI 0x02
    B EXIT
EXIT:
    SWI 0x11
```

OUTPUT:



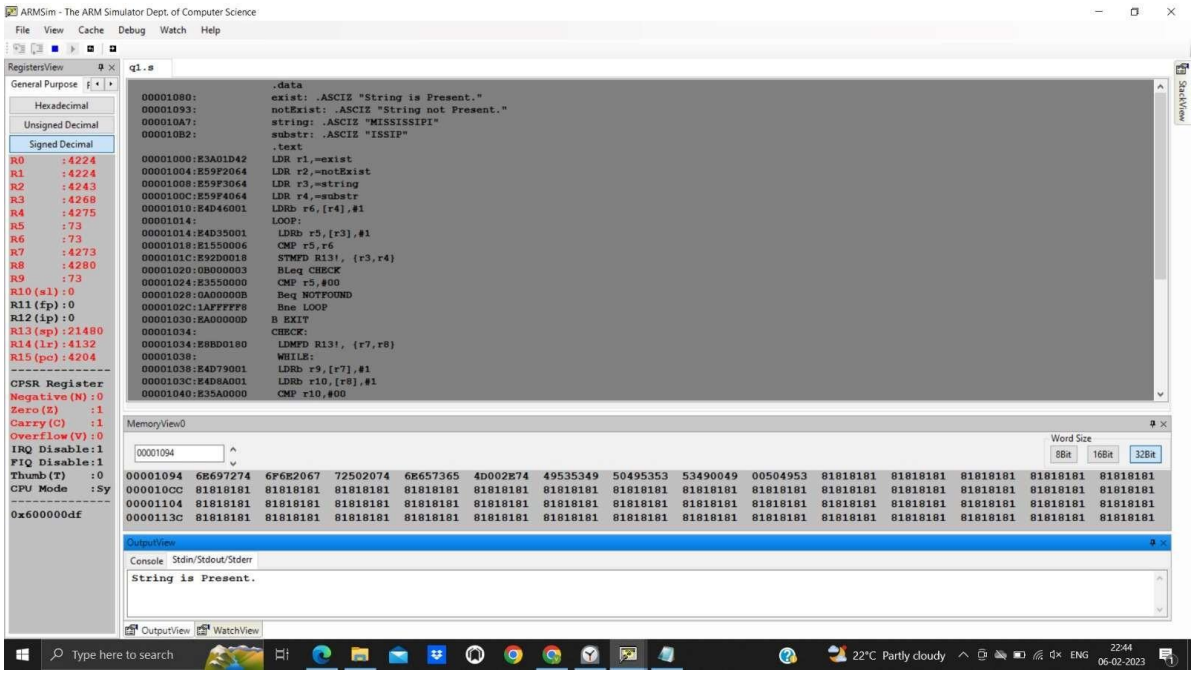
Problem 2:

Write a program in ARM7 TDMI ISA to find a substring in the given main string.

CODE:

```
.data
exist: .ASCIZ "String is Present."
notExist: .ASCIZ "String not Present."
string: .ASCIZ "MISSISSIPI" substr:
.ASCIZ "ISSIP"
.text
LDR r1,=exist
LDR r2,=notExist
LDR r3,=string
LDR r4,=substr LDRb
r6,[r4],#1 LOOP:
   LDRb r5,[r3],#1
   CMP r5,r6
   STMFD R13!, {r3,r4}
   BLeq CHECK
   CMP r5,#00
   Beq NOTFOUND
   Bne LOOP
```

```
B EXIT
CHECK:
   LDMFD R13!, {r7,r8}
WHILE:
       LDRb r9,[r7],#1
       LDRb r10,[r8],#1
       CMP r10,#00
       Beq FOUND
       CMP r10,r9
       MOVne  PC,LR
       B WHILE
FOUND:
   MOV r0,r1
   B OUTPUT
NOTFOUND:
   MOV r0,r2
   B OUTPUT OUTPUT:
   SWI 0x02
   B EXIT
EXIT:
   SWI 0X11 OUTPUT:
```


ARMSim - The ARM Simulator Dept. of Computer Science
File View Cache Debug Watch Help
RegistersView
General Purpose
Hexadecimal
Unsigned Decimal
Signed Decimal
R0 :4224
R1 :4224
R2 :4243
R3 :4268
R4 :4275
R5 :73
R6 :73
R7 :4273
R8 :4280
R9 :73
R10(sl):0
R11(fp):0
R12(ip):0
R13(sp):21480
R14(lr):4132
R15(pc):4204
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 :Sy
0x600000df
q1.s
.data
00001080: exist: .ASCIZ "String is Present."
00001093: notExist: .ASCIZ "String not Present."
000010A7: string: .ASCIZ "MISSISSIPI"
000010B2: substr: .ASCIZ "ISSIP"
.text
00001000:E3A01D42 LDR r1,=exist
00001004:E59F2064 LDR r2,=notExist
00001008:E59F3064 LDR r3,=string
0000100C:E59F4064 LDR r4,=substr
00001010:E4D46001 LDRb r6,[r4],#1
00001014: LOOP:
00001014:E4D35001 LDRb r5,[r3],#1
00001018:E1550006 CMP r5,r6
0000101C:E92D0018 STMFD R13!, {r3,r4}
00001020:0B000003 BLeq CHECK
00001024:E3550000 CMP r5,#00
00001028:0A00000B Beq NOTFOUND
0000102C:1AFFFFF8 Bne LOOP
00001030:EA00000D B EXIT
00001034: CHECK:
00001034:E8BD0180 LDMFD R13!, {r7,r8}
00001038: WHILE:
00001038:E4D79001 LDRb r9,[r7],#1
0000103C:E4D8A001 LDRb r10,[r8],#1
00001040:E35A0000 CMP r10,#00
MemoryView0
00001094
Word Size
8Bit 16Bit 32Bit
00001094 6B697274 6F6E2067 72502074 6B657365 4D002E74 49535349 50495353 53490049 00504953 81818181 81818181 81818181 81818181 81818181
000010CC 81818181 81818181 81818181 81818181 81818181 81818181 81818181 81818181 81818181 81818181 81818181 81818181 81818181 81818181
00001104 81818181 81818181 81818181 81818181 81818181 81818181 81818181 81818181 81818181 81818181 81818181 81818181 81818181 81818181
0000113C 81818181 81818181 81818181 81818181 81818181 81818181 81818181 81818181 81818181 81818181 81818181 81818181 81818181 81818181
OutputView
Console Stdin/Stdout/Stderr
String is Present.
OutputView WatchView
Type here to search
22°C Partly cloudy
ENG
22:44
06-02-2023