DEPARTMENT OF ELECTRONICS & COMMUNICATION ENGINEERING

THAPAR INSTITUTE
OF ENGINEERING & TECHNOLOGY
(Deemed to be University)

Embedded System

Experiment-9

Submitted by

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Experiment 9

Aim:

To write an ARM Assembly Language program for arranging the number in to ascending and descending order.

Tool Used:

Keil uVision4

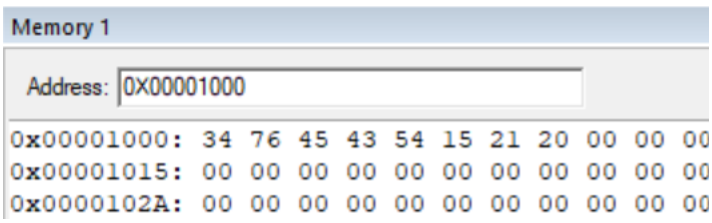
Theory:

LDR loads the register with some value. One register can be used as a counter. STRCSB is used to store byte if carry is set. STRCCB is used to store byte if carry is clear. CMP is used to compare the values in two registers.

Code(ascending):

```
 AREA PROGRAM, CODE, READONLY
 ENTRY
MAIN
 MOV R0, #9
LOOP1    LDR R1, =0X00001000
         ADD R2, R1, #1
         MOV R3, R0

LOOP2    LDRB R4, [R1]
         LDRB R5, [R2]
         CMP R4, R5
         STRCSB R4, [R2]
         STRCSB R5, [R1]
         ADD R1, R1, #1
         ADD R2, R2, #1
         SUBS R3, R3, #1
         BNE LOOP2
         SUBS R0, R0, #1
         BNE LOOP1
         END
```

Input:



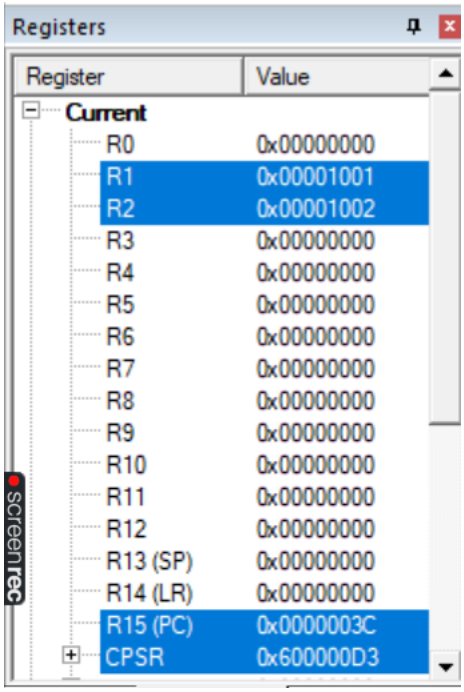
Output:

Memory 1

Address: 0X00001000

```
0x00001000: 00 00 15 20 21 34 43 45 54 76 00
0x00001015: 00 00 00 00 00 00 00 00 00 00 00
0x0000102A: 00 00 00 00 00 00 00 00 00 00 00
0x0000103F: 00 00 00 00 00 00 00 00 00 00 00
```

Register Content

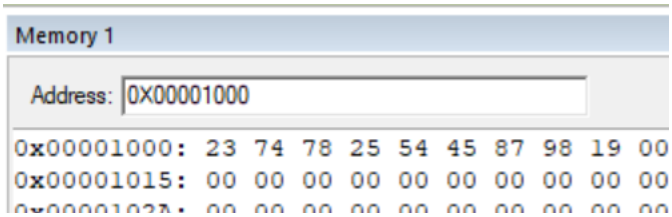


Code(descending):

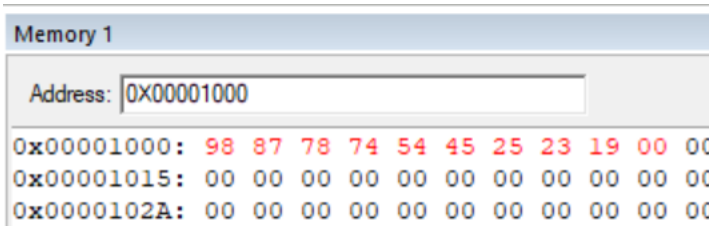
```
      AREA PROGRAM, CODE, READONLY
      ENTRY
MAIN
      MOV R0, #9
LOOP1    LDR R1, =0X00001000
         ADD R2, R1, #1
         MOV R3, R0

LOOP2    LDRB R4, [R1]
         LDRB R5, [R2]
         CMP R4, R5
         STRCCB R4, [R2]
         STRCCB R5, [R1]
         ADD R1, R1, #1
         ADD R2, R2, #1
         SUBS R3, R3, #1
         BNE LOOP2
```

```
SUBS R0, R0, #1
BNE LOOP1
END
```

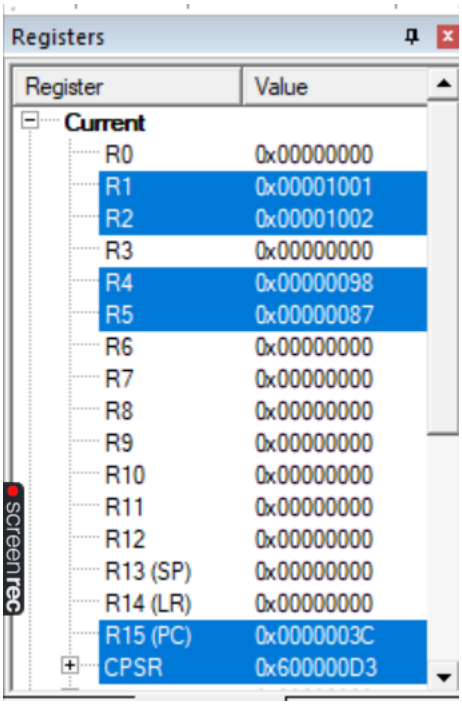
Input:



Output:



Register Content:



Result:

The experiments on arranging the number in to ascending and descending order have been performed and verified to be correct.