

Program Assembly Code:

```
        AREA Reset, CODE, Readonly
ENTRY
;declarations
ADD1 EQU 0x40000004
ADD2 EQU 0x40000008
COUNT RN R5
COUN2 RN R6
MAX RN R7
MIN RN R8
POINT RN R9
POIN2 RN R10
NEXT RN R11
NEX2 RN R12

        LDR R1,=ADD1
        LDR R2,=ADD2

        MOV COUNT, #30
        MOV COUN2, #30

        MOV MAX,#0
        MOV MIN,#100

        LDR POINT,=GRADES
        LDR POIN2,=GRADES

;max loop
AGAIN  LDR NEXT,[POINT]
        CMP MAX, NEXT

        BHS CNTU

        MOV MAX, NEXT
CNTU   ADD POINT,POINT, #4

        SUBS COUNT,COUNT,#1
        BNE AGAIN

;min loop
AGAI2  LDR NEX2,[POIN2]
        CMP MIN, NEX2

        BLO CNT2

        MOV MIN, NEX2
CNT2   ADD POIN2,POIN2, #4

        SUBS COUN2,COUN2,#1
        BNE AGAI2

        STR MIN, [R1]
        STR MAX, [R2]

GRADES DCD 67,45,88,90,89,21,98,85,55,34,67,87,77,99,23,44,66,77,88,99,67,83,82,64,37,98,91,73,58,66

stop B stop
        END
```

SRAM Memory Locations:

| Memory 1 | Memory 1 |
|--------------------------------|--------------------------------|
| Address: 0x40000004 | Address: 0x40000008 |
| 0x40000004: 15 00 00 00 63 00 | 0x40000008: 63 00 00 00 00 00 |
| 0x40000001E: 00 00 00 00 00 00 | 0x400000022: 00 00 00 00 00 00 |
| 0x400000038: 00 00 00 00 00 00 | 0x40000003C: 00 00 00 00 00 00 |
| 0x400000052: 00 00 00 00 00 00 | 0x400000056: 00 00 00 00 00 00 |
| 0x40000006C: 00 00 00 00 00 00 | 0x400000070: 00 00 00 00 00 00 |
| 0x400000086: 00 00 00 00 00 00 | 0x40000008A: 00 00 00 00 00 00 |
| 0x4000000A0: 00 00 00 00 00 00 | 0x4000000A4: 00 00 00 00 00 00 |
| 0x4000000BA: 00 00 00 00 00 00 | 0x4000000BE: 00 00 00 00 00 00 |
| 0x4000000D4: 00 00 00 00 00 00 | 0x4000000D8: 00 00 00 00 00 00 |
| 0x4000000FE: 00 00 00 00 00 00 | 0x4000000F2: 00 00 00 00 00 00 |

Minimum value stored in SRAM location 0x40000004 and maximum value is stored in SRAM location 0x40000008

CPSR Register:

| | |
|------|------------|
| CPSR | 0x600000D3 |
| N | 0 |
| Z | 1 |
| C | 1 |
| V | 0 |
| I | 1 |
| F | 1 |
| T | 0 |
| M | 0x13 |

The CPSR register after execution of the program

Used Registers after Code Execution:

| Register | Value |
|----------|------------|
| Current | |
| R0 | 0x00000000 |
| R1 | 0x40000004 |
| R2 | 0x40000008 |
| R3 | 0x00000000 |
| R4 | 0x00000000 |
| R5 | 0x00000000 |
| R6 | 0x00000000 |
| R7 | 0x00000063 |
| R8 | 0x00000015 |
| R9 | 0x000000D8 |
| R10 | 0x000000D8 |
| R11 | 0x00000042 |
| R12 | 0x00000042 |
| R13 (SP) | 0x00000000 |
| R14 (LR) | 0x00000000 |
| R15 (PC) | 0x000000D8 |
| CPSR | 0x600000D3 |
| SPSR | 0x00000000 |

Registers used after the program execution. I used R1 and R2 to hold the SRAM locations where the min and max values would be stored. R7 and R8 hold the min and max values that get changed by the loop. R5, R6 are counters for the two loops. R9, R10 are pointers for the loops. R11, R12 store the next value in the list to use a comparison for the loops.