

EXPERIMENT 3.1

Sorting of ten 8-bits numbers stored in internal data memory in ascending order

Code:

```
ORG 0000H
ACALL READ      ;copy data loop
MOV R1,#0AH     ;number of bytes to process
AGAIN: MOV A,R1
MOV R2,A        ;number of bytes
MOV R0,#30H     ;starting address of data
BACK:  MOV A,@R0 ;1st valur to acc
INC R0          ;next byte
MOV B,@R0       ;2nd value to B
CLR C           ;carry from previous process
SUBB A,B        ;compare 2 nos
JC SKIP         ;skip swapping
MOV B,@R0       ;put 2nd no in B
DEC R0          ;previous byte
MOV A,@R0       ;put 1st no in A
MOV @R0,B       ;swap 2nd no
INC R0          ;next byte
MOV @R0,A       ;swap 1st no
SKIP:  DJNZ R2,BACK ;repeat for next position
        DJNZ R1,AGAIN ;repeat for next number
        SJMP LAST   ;end statement

READ:   MOV R0,#30H ;1st byte of source
        MOV R1,#20H ;1st byte of destination
        MOV R6,#0AH ;number of bytes
COPY:   MOV A,@R0   ;copying input ...
        MOV @R1,A   ;   for reference
        INC R1      ;next byte
        INC R0      ;next byte
        DJNZ R6,COPY ;repeat for n bytes
        RET         ;return to main program

LAST:   NOP         ;close program
        END
```

Output:

Internal memory:

before running the code:

```
I:0x20: 00 00 00 00 00 00 00 00 00 00 00
I:0x30: 10 12 14 10 00 FF A0 06 02 13
I:0x40: 00 00 00 00 00 00 00 00 00 00 00
```

after running the code:

```
I:0x20: 10 12 14 10 00 FF A0 06 02 13 00
I:0x30: 00 00 02 06 10 10 12 13 14 A0 FF
I:0x40: 00 00 00 00 00 00 00 00 00 00 00
```

SFRs:

Register	Value
Regs	
r0	0x31
r1	0x00
r2	0x00
r3	0x00
r4	0x00
r5	0x00
r6	0x00
r7	0x00
Sys	
a	0x00
b	0x00
sp	0x07
sp_max	0x09
dptr	0x0000
PC \$	C:0x002D
states	967
sec	0.00048350
psw	0x00