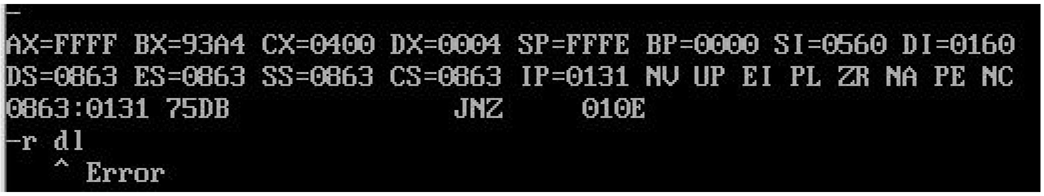
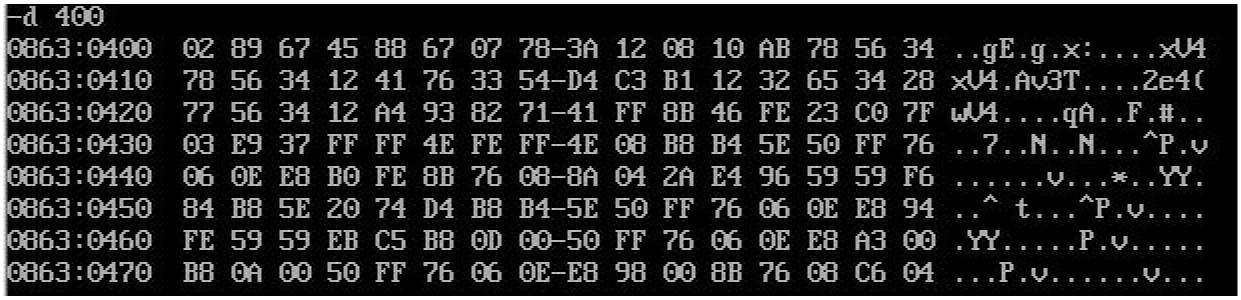
1. Logic:
   a. To check negative, we need to check the sign bit. Firstly, the EBX register is cleared, then the contents of the array is added to it. This makes sign bit 1 if it is negative number.
   b. We make jump if not signed and increment dx by 1 if it is signed (MSB is 1).
   c. We proceed to make the Most significant nibble 1. For that, first four bits are made 0, by consecutive SHL and SHR operations. Then it is XORed with 01000000 to make the first nibble as 1.
   d. Then, the result is moved to the location marked by SI, which is the newarray organized from 0400h.
2. Screenshots:
   a. [DX Register after last operation: 0004]



```
-
AX=FFFF BX=93A4 CX=0400 DX=0004 SP=FFFE BP=0000 SI=0560 DI=0160
DS=0863 ES=0863 SS=0863 CS=0863 IP=0131 NV UP EI PL ZR NA PE NC
0863:0131 75DB            JNZ     010E
-r dl
   ^ Error
```

   b. [D:400]



```
-d 400
0863:0400  02 89 67 45 88 67 07 78-3A 12 08 10 AB 78 56 34 ..gE.g.x:....xV4
0863:0410  78 56 34 12 41 76 33 54-D4 C3 B1 12 32 65 34 28 xV4.Av3T....2e4(
0863:0420  77 56 34 12 A4 93 82 71-41 FF 8B 46 FE 23 C0 7F wV4....qA..F.#..
0863:0430  03 E9 37 FF FF 4E FE FF-4E 08 B8 B4 5E 50 FF 76 ..7..N..N...^P.v
0863:0440  06 0E E8 B0 FE 8B 76 08-8A 04 2A E4 96 59 59 F6 ......v...*..YY.
0863:0450  84 B8 5E 20 74 D4 B8 B4-5E 50 FF 76 06 0E E8 94 ..^ t...^P.v....
0863:0460  FE 59 59 EB C5 B8 0D 00-50 FF 76 06 0E E8 A3 00 .YY.....P.v.....
0863:0470  B8 0A 00 50 FF 76 06 0E-E8 98 00 8B 76 08 C6 04 ...P.v......v...
```

3. Code:

```
.model tiny
.386
.data
arr     dd
45678902h,78076788h,09008123Ah,345678ABh,0D2345678h,54337641h,
0B2B1C3D4h,28346532h,092345677h,718293A4h
count   db      0ah
xorfac  equ     10000000h
.code
.startup
        lea     di,arr
        lea     si,newarr
        mov     cl,count
        sub     dx,dx
check:  sub     ebx,ebx
        add     ebx,[di]
        jns     moveto
        inc     dx
        shl     ebx,4
        shr     ebx,4
        xor     ebx,xorfac
moveto:         mov     [si],ebx
        add     si,4
        add     di,4
        dec     cl
        jnz     check
.exit
end
```