Tutorial

Fibonacci

- Fibonacci sequence = 0,1,1,2,3,5,8,13 …..
- Sum of previous two elements = new element
- CX - counter value
- AL,DL,BL - general purpose registers

Repeat n times:

Third = first + second // First = -1,Second = 1

First = second

Second = third

Find if number is divisible by 32

Binary representation of multiples of 32

32 - 100000

64 - 1000000

96 - 1100000

128 - 10000000

```
-u 100
0859:0100 BAE0D3        MOV     DX,D3E0
0859:0103 BB1F00        MOV     BX,001F
0859:0106 21D3          AND     BX,DX
0859:0108 83FB00        CMP     BX,+00
0859:010B 7404          JZ      0111
0859:010D B002          MOV     AL,02
0859:010F EB02          JMP     0113
0859:0111 B001          MOV     AL,01
0859:0113 C3            RET
```

Performing AND operation of the number with 1F

0000 0000 0000 1111

Example , 32 -

0000 0000 0001 0000

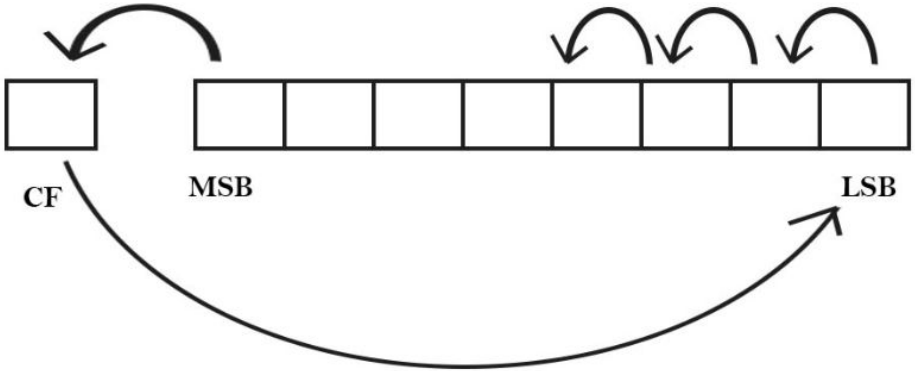
0000 0000 0000 1111

0000 0000 0000 0000

Find the no of 1's

Let's assume some no in Hex **12AB**, translates to 0001001010101011 in Binary.

So how do you calculate the no of 1's ?

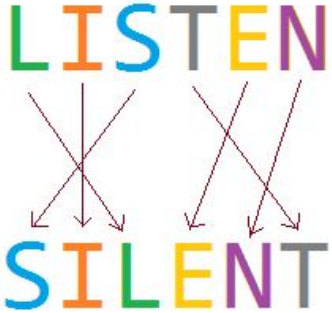


```
0859:0100 BAAB12          MOV     DX,12AB
0859:0103 B90000          MOV     CX,0000
0859:0106 83F910          CMP     CX,+10
0859:0109 7409            JZ      0114
0859:010B 41              INC     CX
0859:010C D1C2            ROL     DX,1
0859:010E 73F6            JAE     0106
0859:0110 FEC0            INC     AL
0859:0112 EBF2            JMP     0106
0859:0114 C3              RET
```

Anagram or not

An anagram of a string is another string that contains the same characters, only the order of characters can be different.

Any ideas ?



Loading text from .txt file to DosBox :

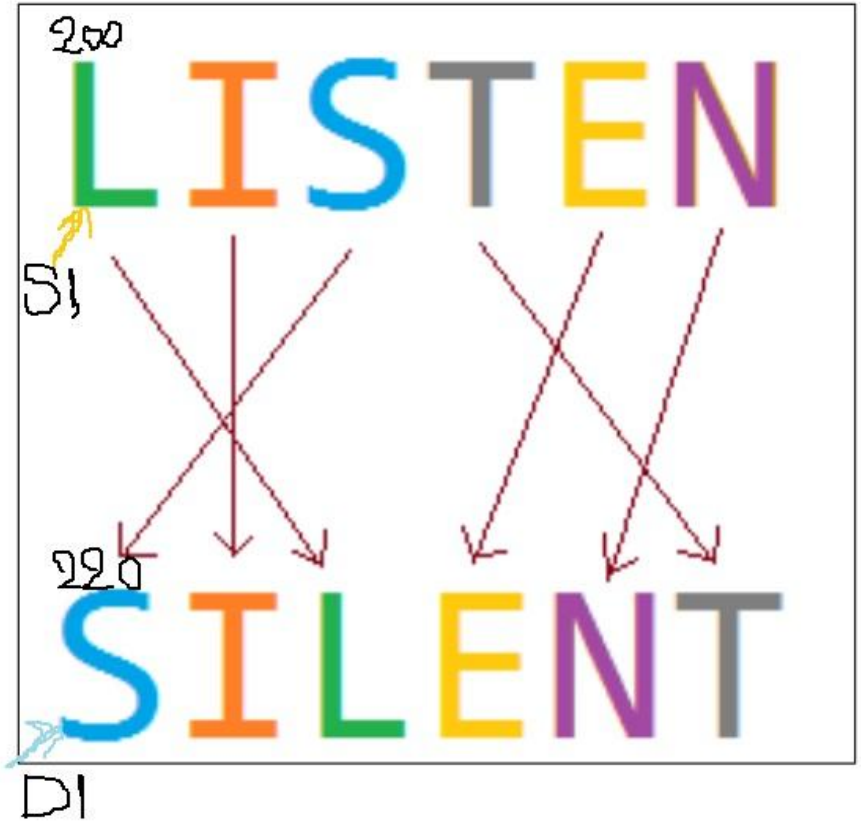
1. Save .txt file in the “**DEBUG**” folder.

2. -n filename.txt

3. -l [memory locaϴon to load]

```
-n l3a.txt
-l 200
-n l3b.txt
-l 220
-d 200
0859:0200  6C 69 73 74 65 6E 00 00-00 00 00 00 00 00 00 00 listen..........
0859:0210  00 00 00 00 00 00 00 00-00 00 00 00 00 00 00 00 ................
0859:0220  73 69 6C 65 6E 74 00 00-00 00 00 00 00 00 00 00 silent..........
0859:0230  00 00 00 00 00 00 00 00-00 00 00 00 00 00 00 00 ................
0859:0240  00 00 00 00 00 00 00 00-00 00 00 00 00 00 00 00 ................
0859:0250  00 00 00 00 00 00 00 00-00 00 00 00 00 00 00 00 ................
0859:0260  00 00 00 00 00 00 00 00-00 00 00 00 00 00 00 00 ................
0859:0270  00 00 00 00 00 00 00 00-00 00 00 00 00 00 00 00 ................
```

```
-u 100
0859:0100 B90600          MOV     CX,0006
0859:0103 BE0000          MOV     SI,0000
0859:0106 8A9C0002        MOV     BL,[SI+0200]
0859:010A BF0000          MOV     DI,0000
0859:010D 3A9D2002        CMP     BL,[DI+0220]
0859:0111 7407            JZ      011A
0859:0113 47              INC     DI
0859:0114 39CF            CMP     DI,CX
0859:0116 75F5            JNZ     010D
0859:0118 EB0D            JMP     0127
0859:011A 888D2002        MOV     [DI+0220],CL
0859:011E 46              INC     SI
0859:011F 39CE            CMP     SI,CX
-
-
0859:0121 75E3            JNZ     0106
0859:0123 B001            MOV     AL,01
0859:0125 EB02            JMP     0129
0859:0127 B002            MOV     AL,02
0859:0129 C3              RET
```



SORTING GIVEN NUMBERS

- Sorting Algorithm used – BUBBLE SORT

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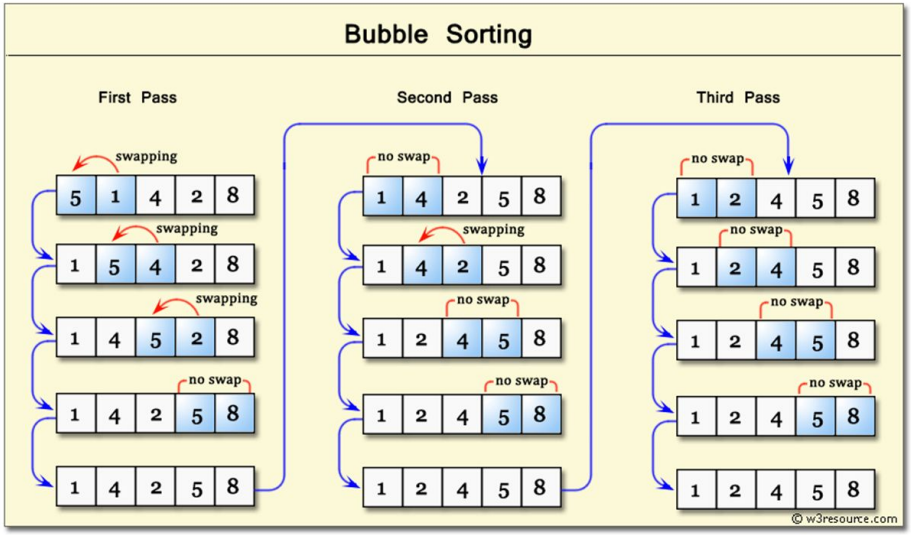

```
Z:\>MOUNT C: C:\8086
Drive C is mounted as local directory C:\8086\

Z:\>C:

C:\>CD DEBUG125

C:\DEBUG125>DEBUGX
-       e 2000
0859:2000  00.5    00.1    00.4    00.2    00.8    00.
-d 2000
0859:2000  05 01 04 02 08 00 00 00-00 00 00 00 00 00 00 00 ....
0859:2010  00 00 00 00 00 00 00 00-00 00 00 00 00 00 00 00 ....
0859:2020  00 00 00 00 00 00 00 00-00 00 00 00 00 00 00 00 ....
0859:2030  00 00 00 00 00 00 00 00-00 00 00 00 00 00 00 00 ....
0859:2040  00 00 00 00 00 00 00 00-00 00 00 00 00 00 00 00 ....
0859:2050  00 00 00 00 00 00 00 00-00 00 00 00 00 00 00 00 ....
0859:2060  00 00 00 00 00 00 00 00-00 00 00 00 00 00 00 00 ....
0859:2070  00 00 00 00 00 00 00 00-00 00 00 00 00 00 00 00 ....
```

```
-A 1000
0859:1000 MOV CH,05
0859:1002 MOV CL, 05
0859:1004 MOV SI,2000
0859:1007 MOV AL, [SI]
0859:1009 MOV BL,[SI+1]
0859:100C CMP AL,BL
0859:100E JC 1018
0859:1010 MOV DL,[SI+1]
0859:1013 XCHG [SI],DL
0859:1015 MOV [SI+1],DL
0859:1018 INC SI
0859:1019 DEC CL
0859:101B JNZ 1007
0859:101D DEC CH
0859:101F JNZ 1002
0859:1021 HLT
0859:1022
-
```

OUTPUT

```
-g=1000 1021
AX=0008 BX=0008 CX=0000 DX=0008 SP=FFFE BP=0000 SI=2005 DI=0000
DS=0859 ES=0859 SS=0859 CS=0859 IP=1021 NV UP EI PL ZR NA PE NC
0859:1021 F4                HLT
-d 2000
0859:2000  01 02 04 05 08 08 00 00-00 00 00 00 00 00 00 00 ................
0859:2010  00 00 00 00 00 00 00 00-00 00 00 00 00 00 00 00 ................
0859:2020  00 00 00 00 00 00 00 00-00 00 00 00 00 00 00 00 ................
0859:2030  00 00 00 00 00 00 00 00-00 00 00 00 00 00 00 00 ................
0859:2040  00 00 00 00 00 00 00 00-00 00 00 00 00 00 00 00 ................
0859:2050  00 00 00 00 00 00 00 00-00 00 00 00 00 00 00 00 ................
0859:2060  00 00 00 00 00 00 00 00-00 00 00 00 00 00 00 00 ................
0859:2070  00 00 00 00 00 00 00 00-00 00 00 00 00 00 00 00 ................
```