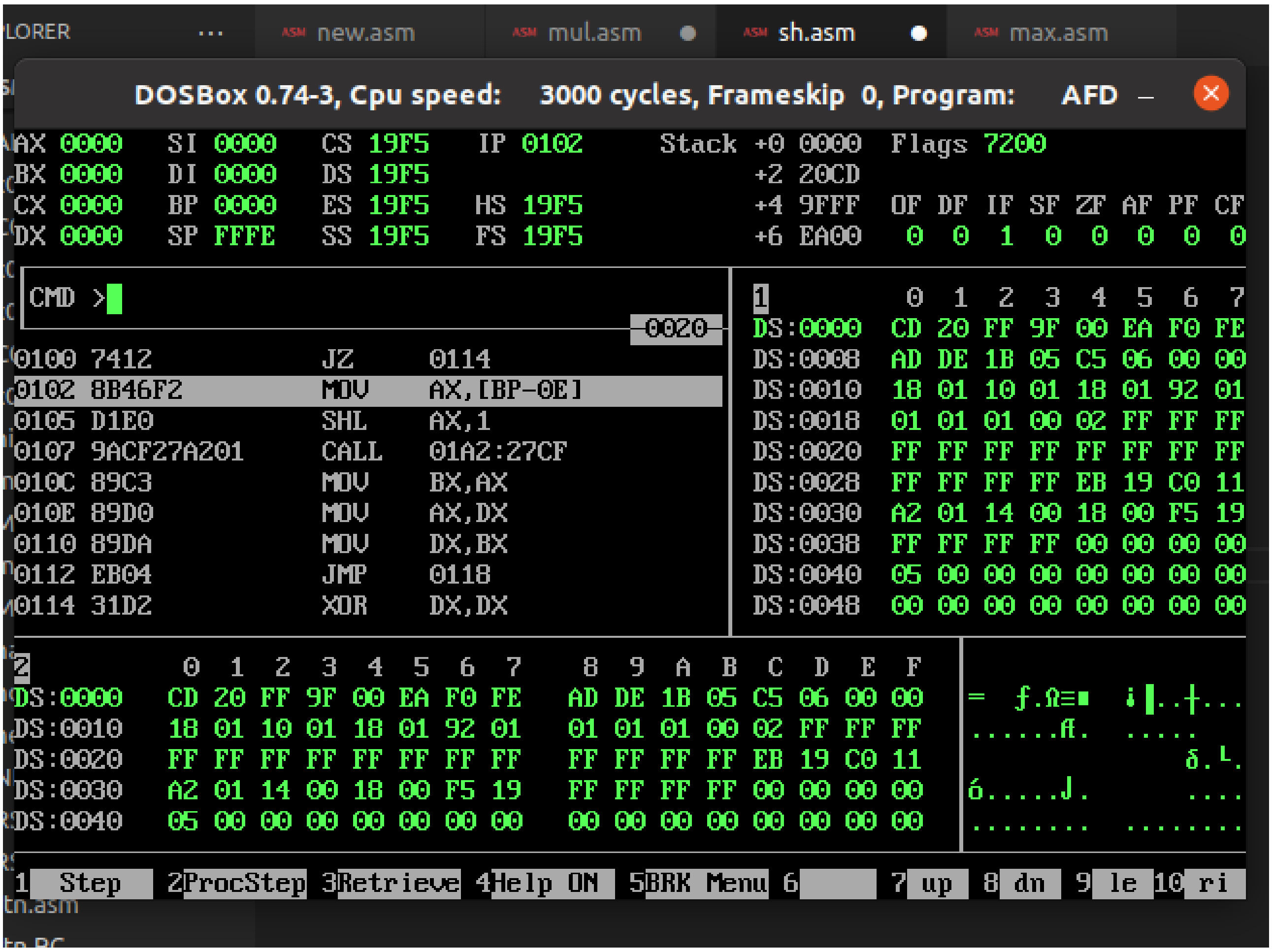
WAQAR AHMED

20P-0750

LAB-REPORT 6

Shift right

```
[org  0x0100]

mov ax,2

shr ax,1
mov ax, 0x4c00
int 0x21
```

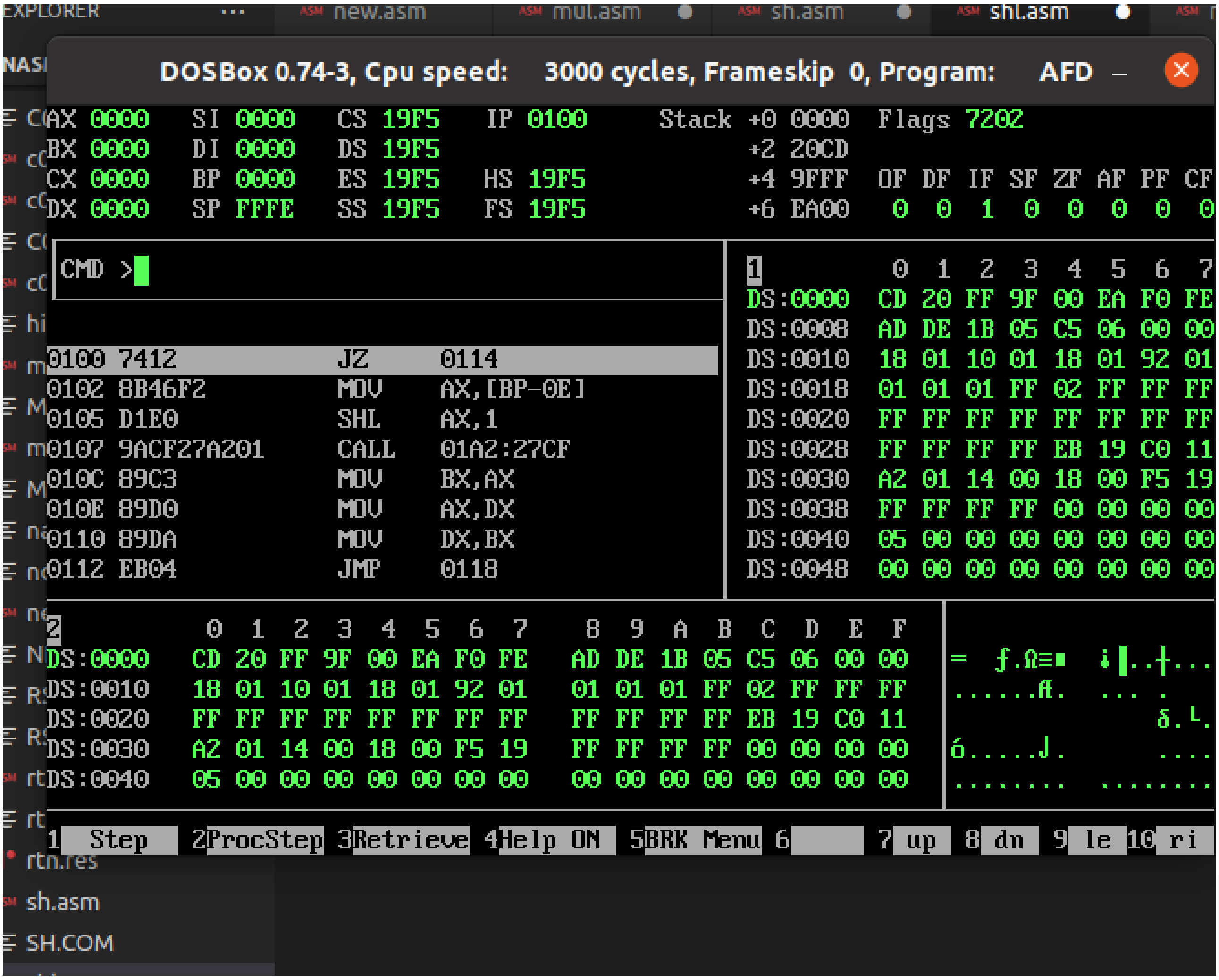


LORERER
new.asm
mul.asm
sh.asm
max.asm
DOSBox 0.74-3, Cpu speed: 3000 cycles, Frameskip 0, Program: AFD
tn.asm

```
AX 0000   SI 0000   CS 19F5   IP 0102      Stack +0 0000  Flags 7200
BX 0000   DI 0000   DS 19F5                      +2 20CD
CX 0000   BP 0000   ES 19F5   HS 19F5            +4 9FFF  OF DF IF SF ZF AF PF CF
DX 0000   SP FFFE   SS 19F5   FS 19F5            +6 EA00   0  0  1  0  0  0  0  0

CMD >                                               1          0  1  2  3  4  5  6  7
                                             -0020- DS:0000   CD 20 FF 9F 00 EA F0 FE
0100 7412           JZ     0114                     DS:0008   AD DE 1B 05 C5 06 00 00
0102 8B46F2         MOV    AX,[BP-0E]               DS:0010   18 01 10 01 18 01 92 01
0105 D1E0           SHL    AX,1                     DS:0018   01 01 01 00 02 FF FF FF
0107 9ACF27A201     CALL   01A2:27CF                DS:0020   FF FF FF FF FF FF FF FF
010C 89C3           MOV    BX,AX                    DS:0028   FF FF FF FF EB 19 C0 11
010E 89D0           MOV    AX,DX                    DS:0030   A2 01 14 00 18 00 F5 19
0110 89DA           MOV    DX,BX                    DS:0038   FF FF FF FF 00 00 00 00
0112 EB04           JMP    0118                     DS:0040   05 00 00 00 00 00 00 00
0114 31D2           XOR    DX,DX                    DS:0048   00 00 00 00 00 00 00 00

2          0  1  2  3  4  5  6  7   8  9  A  B  C  D  E  F
DS:0000   CD 20 FF 9F 00 EA F0 FE  AD DE 1B 05 C5 06 00 00   =  ƒ.Ω≡■  ¡▌..┼...
DS:0010   18 01 10 01 18 01 92 01  01 01 01 00 02 FF FF FF   ......Æ.  .....
DS:0020   FF FF FF FF FF FF FF FF  FF FF FF FF EB 19 C0 11             δ.└.
DS:0030   A2 01 14 00 18 00 F5 19  FF FF FF FF 00 00 00 00   ó.....J.      ....
DS:0040   05 00 00 00 00 00 00 00  00 00 00 00 00 00 00 00   ........  ........

1 Step  2ProcStep  3Retrieve  4Help ON  5BRK Menu  6      7 up  8 dn  9 le  10 ri
```

Shift left:

```
[org 0x0100]


mov al,25


shl al,1
mov ax, 0x4c00
int 0x21
```



```
DOSBox 0.74-3, Cpu speed:   3000 cycles, Frameskip  0, Program:   AFD

AX 0000   SI 0000   CS 19F5   IP 0100      Stack +0 0000  Flags 7202
BX 0000   DI 0000   DS 19F5                      +2 20CD
CX 0000   BP 0000   ES 19F5   HS 19F5            +4 9FFF  OF DF IF SF ZF AF PF CF
DX 0000   SP FFFE   SS 19F5   FS 19F5            +6 EA00   0  0  1  0  0  0  0  0

CMD >                                            1          0  1  2  3  4  5  6  7
                                                 DS:0000   CD 20 FF 9F 00 EA F0 FE
                                                 DS:0008   AD DE 1B 05 C5 06 00 00
0100 7412           JZ      0114                 DS:0010   18 01 10 01 18 01 92 01
0102 8B46F2         MOV     AX,[BP-0E]           DS:0018   01 01 01 FF 02 FF FF FF
0105 D1E0           SHL     AX,1                 DS:0020   FF FF FF FF FF FF FF FF
0107 9ACF27A201     CALL    01A2:27CF            DS:0028   FF FF FF FF EB 19 C0 11
010C 89C3           MOV     BX,AX                DS:0030   A2 01 14 00 18 00 F5 19
010E 89D0           MOV     AX,DX                DS:0038   FF FF FF FF 00 00 00 00
0110 89DA           MOV     DX,BX                DS:0040   05 00 00 00 00 00 00 00
0112 EB04           JMP     0118                 DS:0048   00 00 00 00 00 00 00 00

2           0  1  2  3  4  5  6  7   8  9  A  B  C  D  E  F
DS:0000    CD 20 FF 9F 00 EA F0 FE  AD DE 1B 05 C5 06 00 00   =  ƒ.Ω≡■  ¡▌..┼...
DS:0010    18 01 10 01 18 01 92 01  01 01 01 FF 02 FF FF FF   ......Æ.  ...  .
DS:0020    FF FF FF FF FF FF FF FF  FF FF FF FF EB 19 C0 11                δ.└.
DS:0030    A2 01 14 00 18 00 F5 19  FF FF FF FF 00 00 00 00   ó.....⌡.      ....
DS:0040    05 00 00 00 00 00 00 00  00 00 00 00 00 00 00 00   ........  ........

1 Step  2ProcStep 3Retrieve 4Help ON 5BRK Menu 6       7 up  8 dn  9 le 10 ri
```

Shift arithmetic:

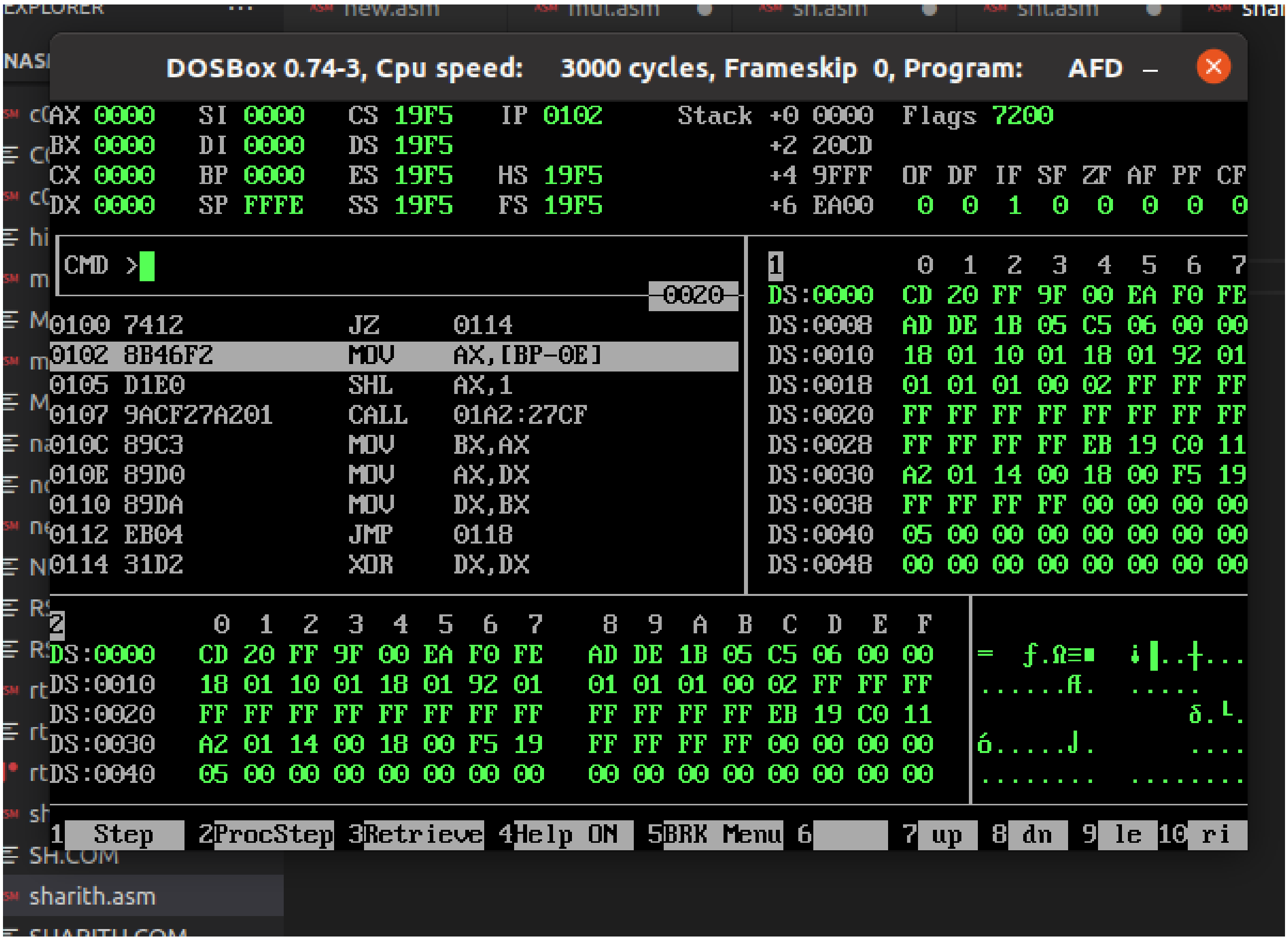
[org 0x0100]

mov ax, 5

sar ax,1

mov ax, 0x4c00

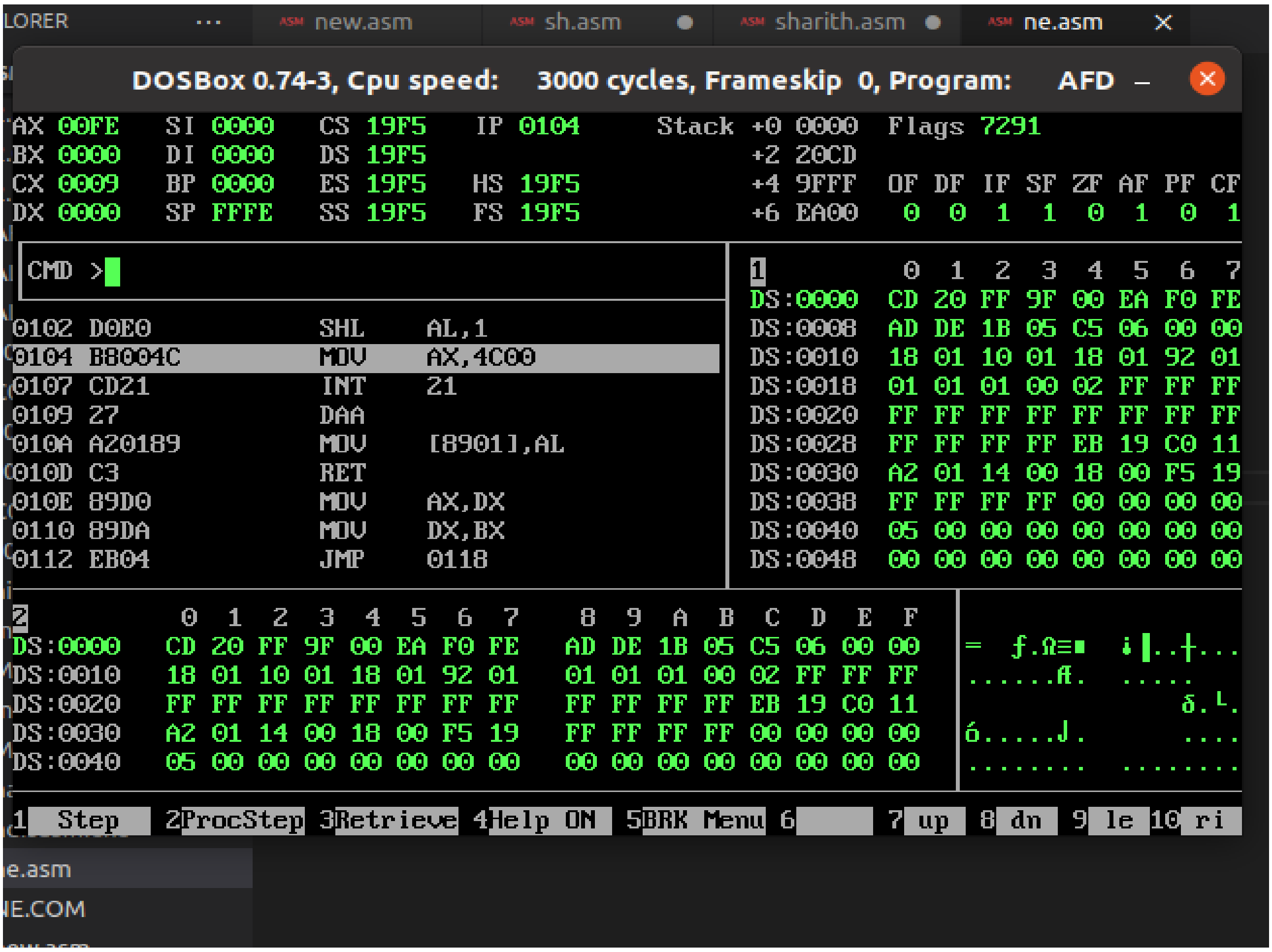
int 0x21



```
AX 0000   SI 0000   CS 19F5   IP 0102     Stack +0 0000  Flags 7200
BX 0000   DI 0000   DS 19F5                     +2 20CD
CX 0000   BP 0000   ES 19F5   HS 19F5           +4 9FFF  OF DF IF SF ZF AF PF CF
DX 0000   SP FFFE   SS 19F5   FS 19F5           +6 EA00   0  0  1  0  0  0  0  0

 CMD >                                            1          0  1  2  3  4  5  6  7
                                         -0020-   DS:0000   CD 20 FF 9F 00 EA F0 FE
0100 7412          JZ     0114                    DS:0008   AD DE 1B 05 C5 06 00 00
0102 8B46F2        MOV    AX,[BP-0E]              DS:0010   18 01 10 01 18 01 92 01
0105 D1E0          SHL    AX,1                    DS:0018   01 01 01 00 02 FF FF FF
0107 9ACF27A201    CALL   01A2:27CF               DS:0020   FF FF FF FF FF FF FF FF
010C 89C3          MOV    BX,AX                   DS:0028   FF FF FF FF EB 19 C0 11
010E 89D0          MOV    AX,DX                   DS:0030   A2 01 14 00 18 00 F5 19
0110 89DA          MOV    DX,BX                   DS:0038   FF FF FF FF 00 00 00 00
0112 EB04          JMP    0118                    DS:0040   05 00 00 00 00 00 00 00
0114 31D2          XOR    DX,DX                   DS:0048   00 00 00 00 00 00 00 00

2          0  1  2  3  4  5  6  7   8  9  A  B  C  D  E  F
DS:0000   CD 20 FF 9F 00 EA F0 FE  AD DE 1B 05 C5 06 00 00   =  ƒ.Ω≡■  ↓▌..┼...
DS:0010   18 01 10 01 18 01 92 01  01 01 01 00 02 FF FF FF   ......Æ.  .....
DS:0020   FF FF FF FF FF FF FF FF  FF FF FF FF EB 19 C0 11               δ.└.
DS:0030   A2 01 14 00 18 00 F5 19  FF FF FF FF 00 00 00 00   ó.....J.      ....
DS:0040   05 00 00 00 00 00 00 00  00 00 00 00 00 00 00 00   ........  ........

1 Step  2ProcStep  3Retrieve  4Help ON  5BRK Menu  6  7 up  8 dn  9 le  10 ri
```

Shift arithmetic left:

```
[org 0x0100]



mov al,210


sal al,1




mov ax, 0x4c00

int 0x21
```

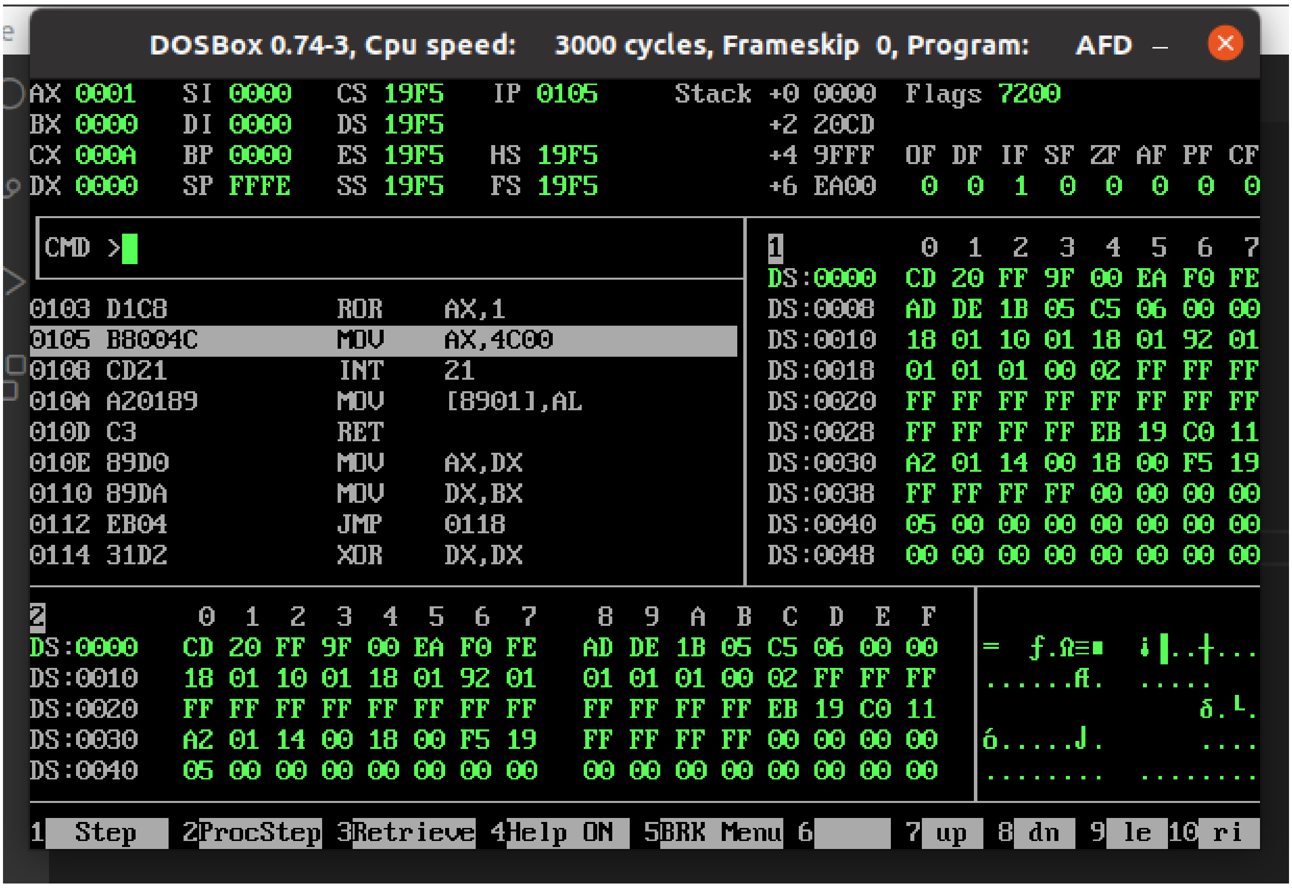


LORER
new.asm
sh.asm
sharith.asm
ne.asm
DOSBox 0.74-3, Cpu speed: 3000 cycles, Frameskip 0, Program: AFD
e.asm
NE.COM

```
AX 00FE   SI 0000   CS 19F5   IP 0104     Stack +0 0000  Flags 7291
BX 0000   DI 0000   DS 19F5                     +2 20CD
CX 0009   BP 0000   ES 19F5   HS 19F5           +4 9FFF  OF DF IF SF ZF AF PF CF
DX 0000   SP FFFE   SS 19F5   FS 19F5           +6 EA00   0  0  1  1  0  1  0  1

CMD >                                       1            0  1  2  3  4  5  6  7
                                            DS:0000   CD 20 FF 9F 00 EA F0 FE
0102 D0E0            SHL     AL,1           DS:0008   AD DE 1B 05 C5 06 00 00
0104 B8004C          MOV     AX,4C00        DS:0010   18 01 10 01 18 01 92 01
0107 CD21            INT     21             DS:0018   01 01 01 00 02 FF FF FF
0109 27              DAA                    DS:0020   FF FF FF FF FF FF FF FF
010A A20189          MOV     [8901],AL      DS:0028   FF FF FF FF EB 19 C0 11
010D C3              RET                    DS:0030   A2 01 14 00 18 00 F5 19
010E 89D0            MOV     AX,DX          DS:0038   FF FF FF FF 00 00 00 00
0110 89DA            MOV     DX,BX          DS:0040   05 00 00 00 00 00 00 00
0112 EB04            JMP     0118           DS:0048   00 00 00 00 00 00 00 00

2           0  1  2  3  4  5  6  7   8  9  A  B  C  D  E  F
DS:0000    CD 20 FF 9F 00 EA F0 FE  AD DE 1B 05 C5 06 00 00   =  ƒ.Ω≡■  ¡▌..┼...
DS:0010    18 01 10 01 18 01 92 01  01 01 01 00 02 FF FF FF   ......Æ.  .....
DS:0020    FF FF FF FF FF FF FF FF  FF FF FF FF EB 19 C0 11             δ.└.
DS:0030    A2 01 14 00 18 00 F5 19  FF FF FF FF 00 00 00 00   ó.....J.      ....
DS:0040    05 00 00 00 00 00 00 00  00 00 00 00 00 00 00 00   ........  ........

1 Step  2ProcStep  3Retrieve  4Help ON  5BRK Menu  6        7 up  8 dn  9 le  10 ri
```

Ror:

```
[org 0x0100]



mov ax, 2

ror ax, 1




mov ax, 0x4c00

int 0x21
```

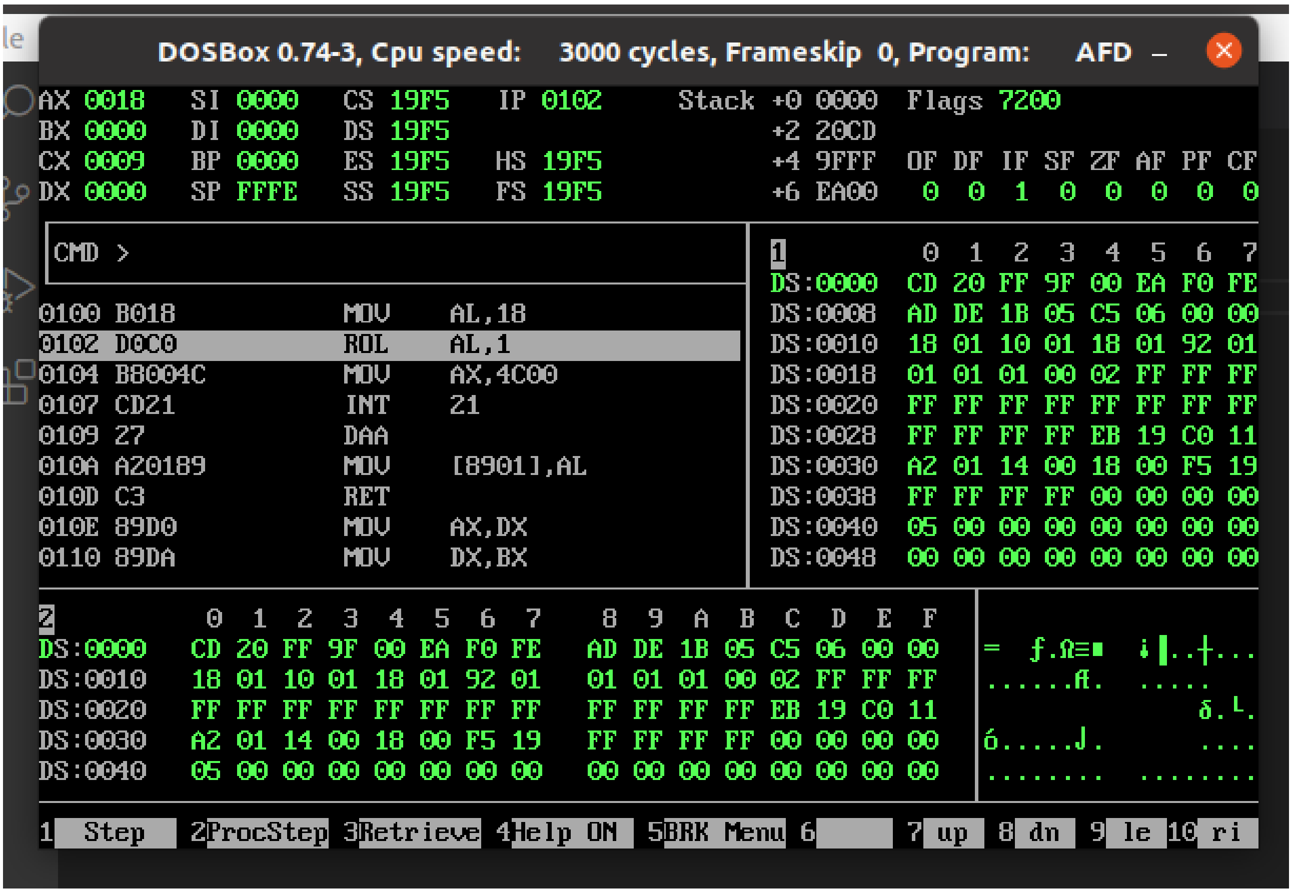


DOSBox 0.74-3, Cpu speed: 3000 cycles, Frameskip 0, Program: AFD

```
AX 0001   SI 0000   CS 19F5   IP 0105     Stack +0 0000  Flags 7200
BX 0000   DI 0000   DS 19F5                     +2 20CD
CX 000A   BP 0000   ES 19F5   HS 19F5           +4 9FFF   OF DF IF SF ZF AF PF CF
DX 0000   SP FFFE   SS 19F5   FS 19F5           +6 EA00    0  0  1  0  0  0  0  0

 CMD >                                          1          0  1  2  3  4  5  6  7
                                                DS:0000   CD 20 FF 9F 00 EA F0 FE
0103 D1C8          ROR    AX,1                  DS:0008   AD DE 1B 05 C5 06 00 00
0105 B8004C        MOV    AX,4C00               DS:0010   18 01 10 01 18 01 92 01
0108 CD21          INT    21                    DS:0018   01 01 01 00 02 FF FF FF
010A A20189        MOV    [8901],AL             DS:0020   FF FF FF FF FF FF FF FF
010D C3            RET                          DS:0028   FF FF FF FF EB 19 C0 11
010E 89D0          MOV    AX,DX                 DS:0030   A2 01 14 00 18 00 F5 19
0110 89DA          MOV    DX,BX                 DS:0038   FF FF FF FF 00 00 00 00
0112 EB04          JMP    0118                  DS:0040   05 00 00 00 00 00 00 00
0114 31D2          XOR    DX,DX                 DS:0048   00 00 00 00 00 00 00 00

2          0  1  2  3  4  5  6  7   8  9  A  B  C  D  E  F
DS:0000   CD 20 FF 9F 00 EA F0 FE  AD DE 1B 05 C5 06 00 00   ═  ƒ.Ω≡■ ¡▐..┼...
DS:0010   18 01 10 01 18 01 92 01  01 01 01 00 02 FF FF FF   ......Æ. .....
DS:0020   FF FF FF FF FF FF FF FF  FF FF FF FF EB 19 C0 11               δ.└.
DS:0030   A2 01 14 00 18 00 F5 19  FF FF FF FF 00 00 00 00   ó.....⌡.    ....
DS:0040   05 00 00 00 00 00 00 00  00 00 00 00 00 00 00 00   ........ ........

1 Step  2ProcStep 3Retrieve 4Help ON  5BRK Menu 6       7 up  8 dn  9 le 10 ri
```

Rol:

```
[org 0x0100]


mov al, 24


rol al,1




mov ax, 0x4c00

int 0x21
```

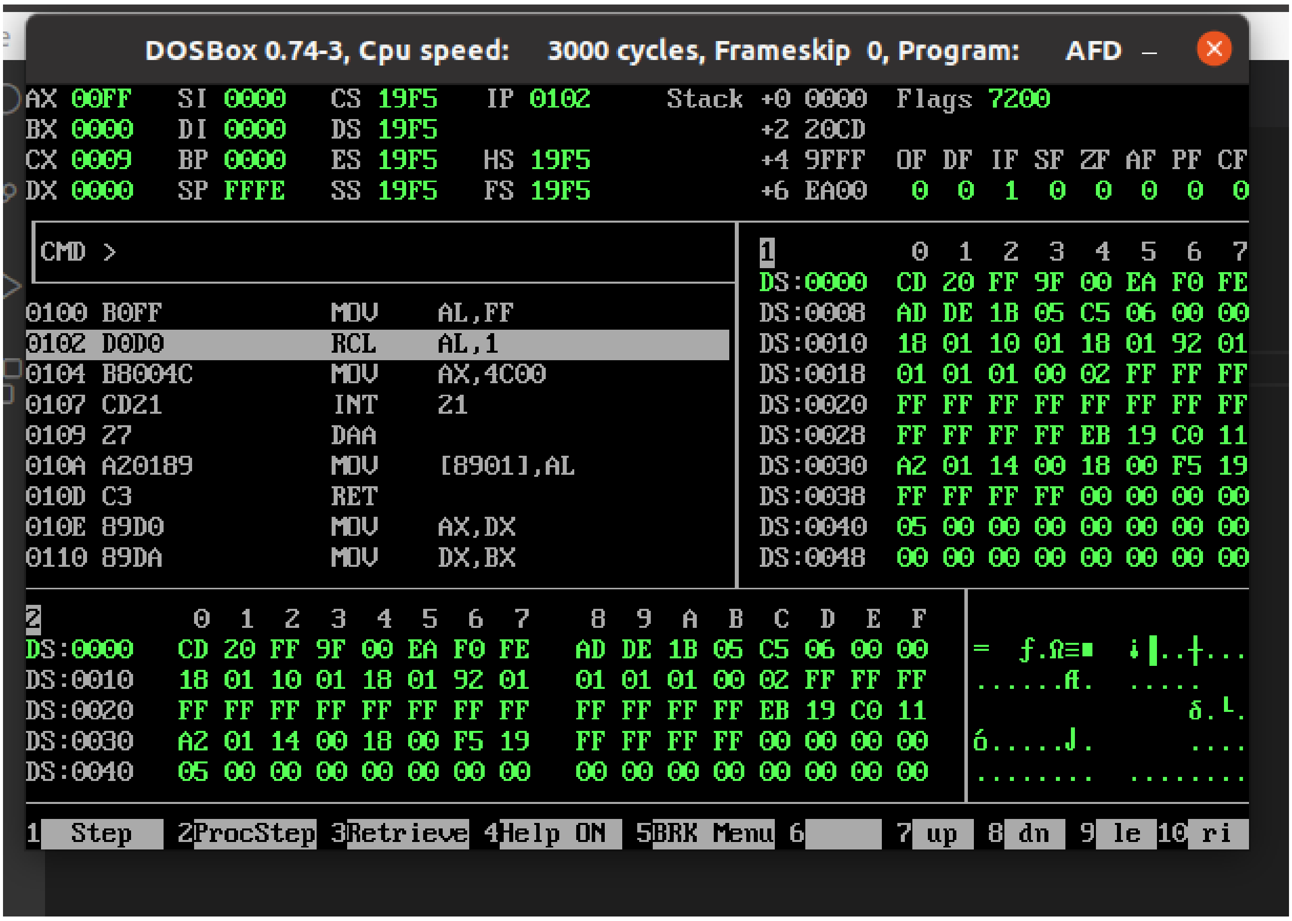


DOSBox 0.74-3, Cpu speed: 3000 cycles, Frameskip 0, Program: AFD

```
AX 0018    SI 0000    CS 19F5    IP 0102      Stack +0 0000  Flags 7200
BX 0000    DI 0000    DS 19F5                       +2 20CD
CX 0009    BP 0000    ES 19F5    HS 19F5            +4 9FFF  OF DF IF SF ZF AF PF CF
DX 0000    SP FFFE    SS 19F5    FS 19F5            +6 EA00   0  0  1  0  0  0  0  0

 CMD >                                          1           0  1  2  3  4  5  6  7
                                                DS:0000  CD 20 FF 9F 00 EA F0 FE
0100 B018             MOV     AL,18             DS:0008  AD DE 1B 05 C5 06 00 00
0102 D0C0             ROL     AL,1              DS:0010  18 01 10 01 18 01 92 01
0104 B8004C           MOV     AX,4C00           DS:0018  01 01 01 00 02 FF FF FF
0107 CD21             INT     21                DS:0020  FF FF FF FF FF FF FF FF
0109 27               DAA                       DS:0028  FF FF FF FF EB 19 C0 11
010A A20189           MOV     [8901],AL         DS:0030  A2 01 14 00 18 00 F5 19
010D C3               RET                       DS:0038  FF FF FF FF 00 00 00 00
010E 89D0             MOV     AX,DX             DS:0040  05 00 00 00 00 00 00 00
0110 89DA             MOV     DX,BX             DS:0048  00 00 00 00 00 00 00 00

2          0  1  2  3  4  5  6  7   8  9  A  B  C  D  E  F
DS:0000   CD 20 FF 9F 00 EA F0 FE  AD DE 1B 05 C5 06 00 00   =  ƒ.Ω≡■  ↓▐..┼...
DS:0010   18 01 10 01 18 01 92 01  01 01 01 00 02 FF FF FF   ......Æ.  .....
DS:0020   FF FF FF FF FF FF FF FF  FF FF FF FF EB 19 C0 11             δ.└.
DS:0030   A2 01 14 00 18 00 F5 19  FF FF FF FF 00 00 00 00   ó.....J.      ....
DS:0040   05 00 00 00 00 00 00 00  00 00 00 00 00 00 00 00   ........  ........

1  Step   2ProcStep 3Retrieve 4Help ON  5BRK Menu 6        7 up  8 dn  9 le  10 ri
```

Rcl:

```
[org 0x0100]

mov al, 255
rcl al,1

mov ax, 0x4c00
int 0x21
```



DOSBox 0.74-3, Cpu speed: 3000 cycles, Frameskip 0, Program: AFD

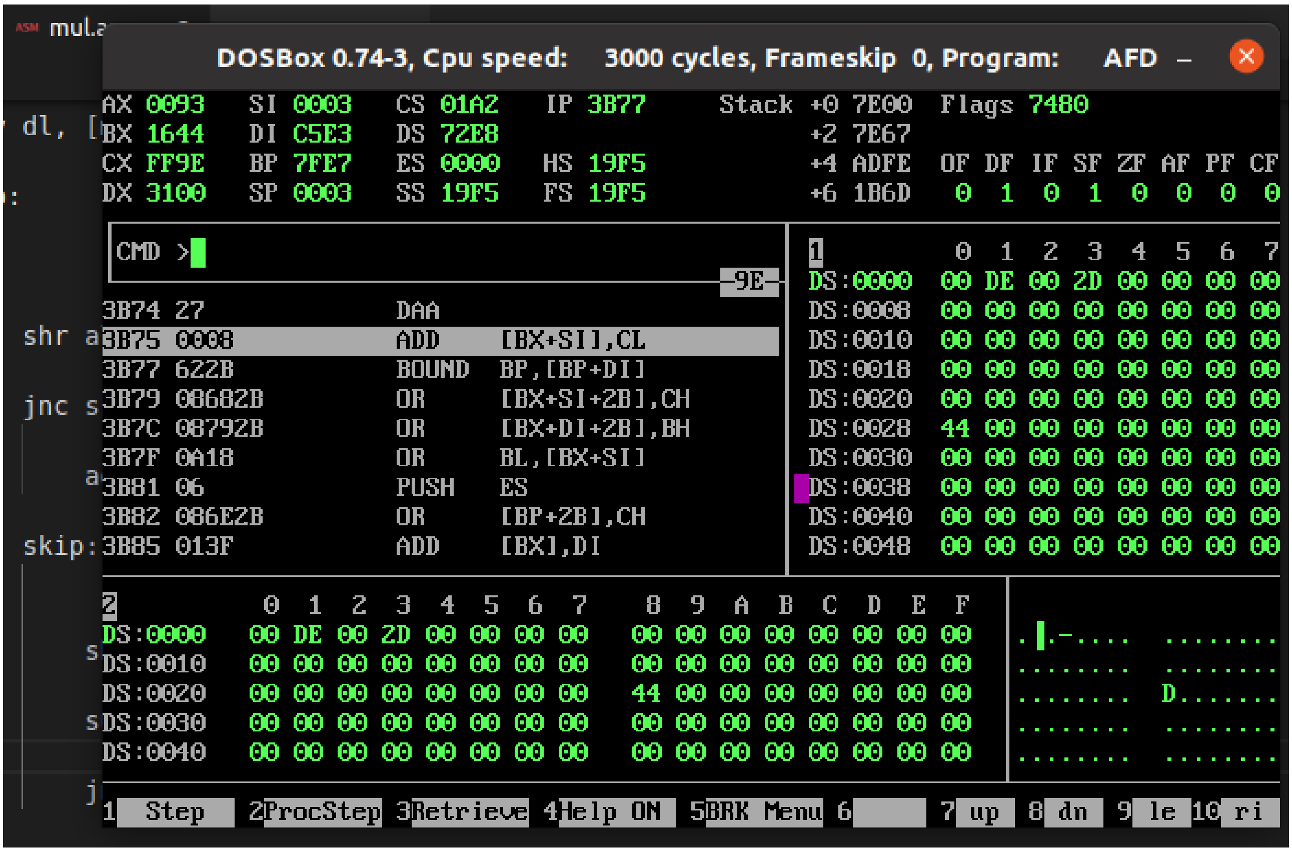
```
AX 00FF   SI 0000   CS 19F5   IP 0102      Stack +0 0000  Flags 7200
BX 0000   DI 0000   DS 19F5                      +2 20CD
CX 0009   BP 0000   ES 19F5   HS 19F5            +4 9FFF  OF DF IF SF ZF AF PF CF
DX 0000   SP FFFE   SS 19F5   FS 19F5            +6 EA00   0  0  1  0  0  0  0  0

 CMD >                                          1          0  1  2  3  4  5  6  7
                                                DS:0000  CD 20 FF 9F 00 EA F0 FE
0100 B0FF           MOV     AL,FF               DS:0008  AD DE 1B 05 C5 06 00 00
0102 D0D0           RCL     AL,1                DS:0010  18 01 10 01 18 01 92 01
0104 B8004C         MOV     AX,4C00             DS:0018  01 01 01 00 02 FF FF FF
0107 CD21           INT     21                  DS:0020  FF FF FF FF FF FF FF FF
0109 27             DAA                         DS:0028  FF FF FF FF EB 19 C0 11
010A A20189         MOV     [8901],AL           DS:0030  A2 01 14 00 18 00 F5 19
010D C3             RET                         DS:0038  FF FF FF FF 00 00 00 00
010E 89D0           MOV     AX,DX               DS:0040  05 00 00 00 00 00 00 00
0110 89DA           MOV     DX,BX               DS:0048  00 00 00 00 00 00 00 00

2          0  1  2  3  4  5  6  7   8  9  A  B  C  D  E  F
DS:0000   CD 20 FF 9F 00 EA F0 FE  AD DE 1B 05 C5 06 00 00   =  ƒ.Ω≡■  ↓▌..┼...
DS:0010   18 01 10 01 18 01 92 01  01 01 01 00 02 FF FF FF   ......Æ.  .....
DS:0020   FF FF FF FF FF FF FF FF  FF FF FF FF EB 19 C0 11                 δ.└.
DS:0030   A2 01 14 00 18 00 F5 19  FF FF FF FF 00 00 00 00   ó.....J.      ....
DS:0040   05 00 00 00 00 00 00 00  00 00 00 00 00 00 00 00   ........  ........
```

1 Step 2ProcStep 3Retrieve 4Help ON 5BRK Menu 6 7 up 8 dn 9 le 10 ri

MUL:

```
[org 0x0100]

jmp start

multiplicand: db 13

multiplier: db 5

result : dw 0


start:
    mov cx,4
    mov al, [multiplier]

    mov dl, [multiplicand]

    lup:


        shr al,1

        jnc skip

            add [result], dl

        skip:
```

```
        shl dl, 1

        sub cx, 1

        jnz lup

mov dx, 0

mov dx, [result]

mov ax, 0x4c00
int 0x21
```



DOSBox 0.74-3, Cpu speed: 3000 cycles, Frameskip 0, Program: AFD

```
AX 0093   SI 0003   CS 01A2   IP 3B77      Stack +0 7E00  Flags 7480
BX 1644   DI C5E3   DS 72E8                      +2 7E67
CX FF9E   BP 7FE7   ES 0000  HS 19F5             +4 ADFE  OF DF IF SF ZF AF PF CF
DX 3100   SP 0003   SS 19F5  FS 19F5             +6 1B6D   0  1  0  1  0  0  0  0

 CMD >                                                 1       0  1  2  3  4  5  6  7
                                              -9E-  DS:0000  00 DE 00 2D 00 00 00 00
3B74 27                   DAA                       DS:0008  00 00 00 00 00 00 00 00
3B75 0008                 ADD    [BX+SI],CL         DS:0010  00 00 00 00 00 00 00 00
3B77 622B                 BOUND  BP,[BP+DI]         DS:0018  00 00 00 00 00 00 00 00
3B79 08682B               OR     [BX+SI+2B],CH      DS:0020  00 00 00 00 00 00 00 00
3B7C 08792B               OR     [BX+DI+2B],BH      DS:0028  44 00 00 00 00 00 00 00
3B7F 0A18                 OR     BL,[BX+SI]         DS:0030  00 00 00 00 00 00 00 00
3B81 06                   PUSH   ES                 DS:0038  00 00 00 00 00 00 00 00
3B82 086E2B               OR     [BP+2B],CH         DS:0040  00 00 00 00 00 00 00 00
3B85 013F                 ADD    [BX],DI            DS:0048  00 00 00 00 00 00 00 00

2          0  1  2  3  4  5  6  7    8  9  A  B  C  D  E  F
DS:0000   00 DE 00 2D 00 00 00 00   00 00 00 00 00 00 00 00   . .-....  ........
DS:0010   00 00 00 00 00 00 00 00   00 00 00 00 00 00 00 00   ........  ........
DS:0020   00 00 00 00 00 00 00 00   44 00 00 00 00 00 00 00   ........  D.......
DS:0030   00 00 00 00 00 00 00 00   00 00 00 00 00 00 00 00   ........  ........
DS:0040   00 00 00 00 00 00 00 00   00 00 00 00 00 00 00 00   ........  ........
```

1 Step 2ProcStep 3Retrieve 4Help ON 5BRK Menu 6 7 up 8 dn 9 le 10 ri