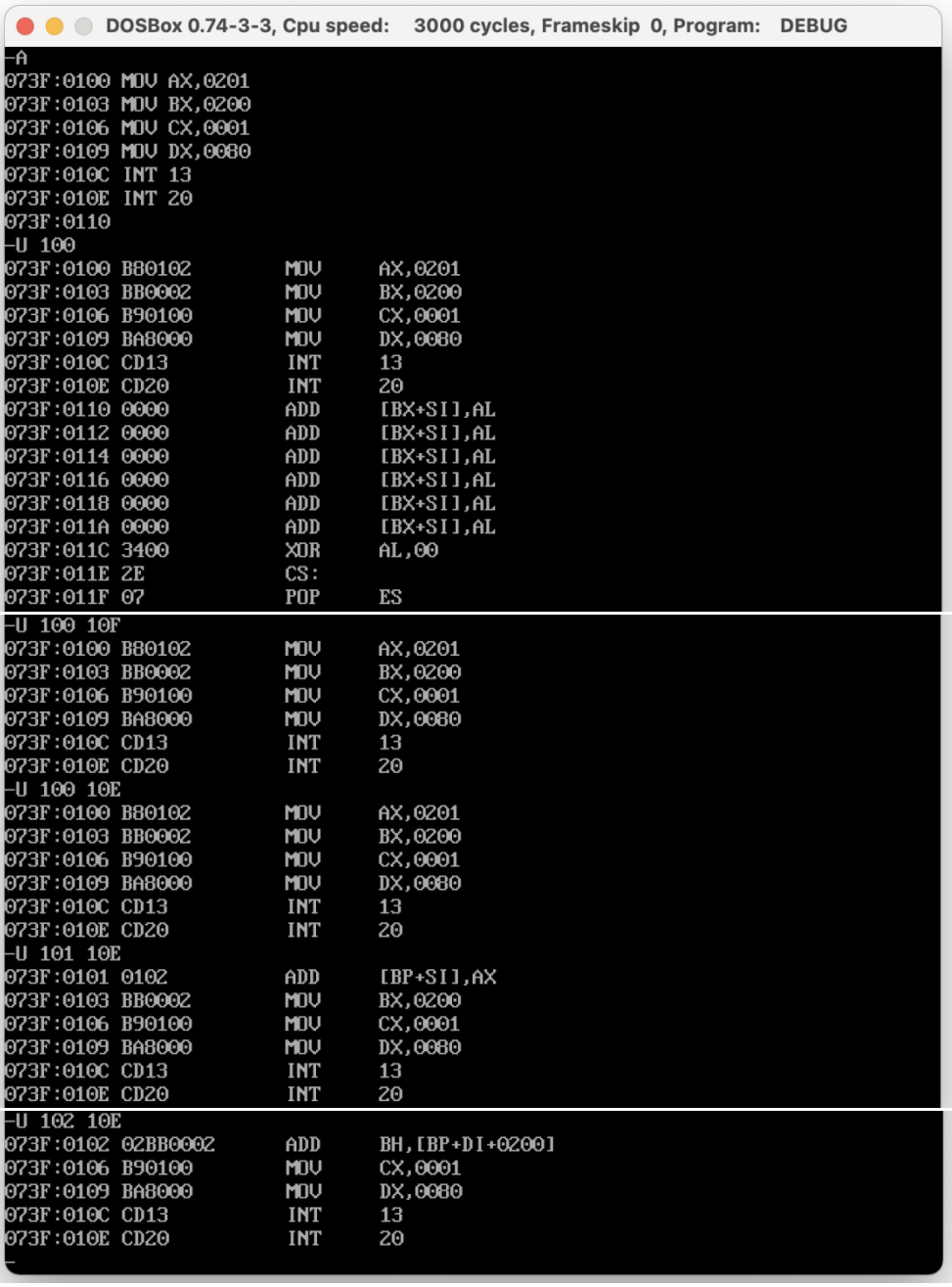
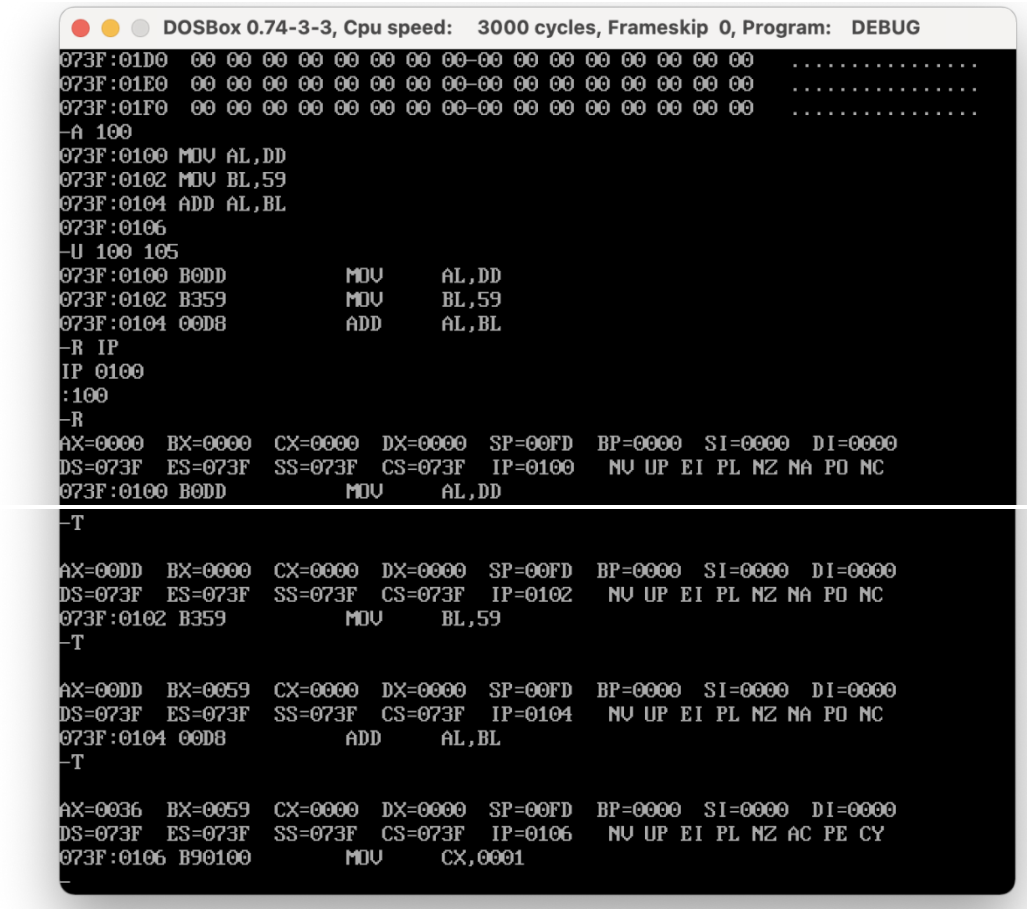
附页（程序执行过程）

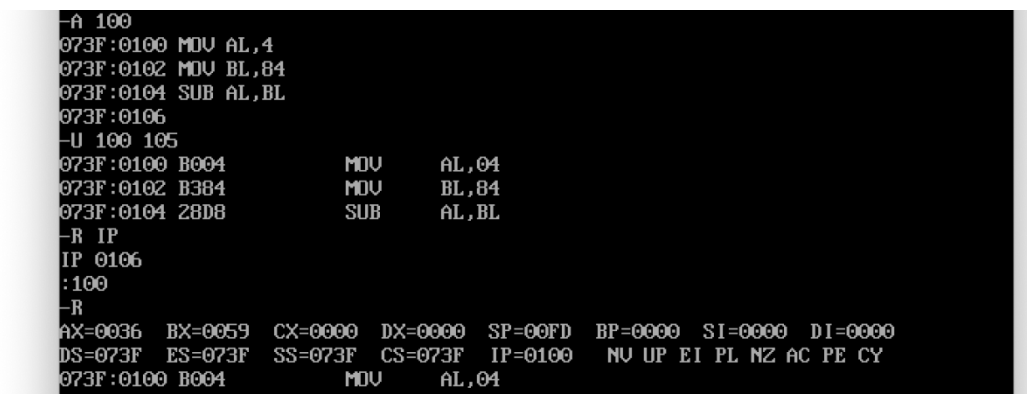
一、读硬盘主引导扇区程序



二、单步执行完成二进制加法 11011101+01011001



三、单步执行完成计算 4-(-124)的程序



```
-T

AX=0004  BX=0059  CX=0000  DX=0000  SP=00FD  BP=0000  SI=0000  DI=0000
DS=073F  ES=073F  SS=073F  CS=073F  IP=0102   NV UP EI PL NZ AC PE CY
073F:0102 B384          MOV     BL,84
-T

AX=0004  BX=0084  CX=0000  DX=0000  SP=00FD  BP=0000  SI=0000  DI=0000
DS=073F  ES=073F  SS=073F  CS=073F  IP=0104   NV UP EI PL NZ AC PE CY
073F:0104 28D8          SUB     AL,BL
-T

AX=0080  BX=0084  CX=0000  DX=0000  SP=00FD  BP=0000  SI=0000  DI=0000
DS=073F  ES=073F  SS=073F  CS=073F  IP=0106   OV UP EI NG NZ NA PO CY
073F:0106 B90100        MOV     CX,0001
```

在十六位范围内执行

```
-A 100
073F:0100 MOV AX,4
073F:0103 MOV BX,FF84
073F:0106 SUB AX,BX
073F:0108
-U 100 107
073F:0100 B80400        MOV     AX,0004
073F:0103 BB84FF        MOV     BX,FF84
073F:0106 29D8          SUB     AX,BX
-R IP
IP 0106
:100
-R
AX=0080  BX=0084  CX=0000  DX=0000  SP=00FD  BP=0000  SI=0000  DI=0000
DS=073F  ES=073F  SS=073F  CS=073F  IP=0100   OV UP EI NG NZ NA PO CY
073F:0100 B80400        MOV     AX,0004
-T

AX=0004  BX=0084  CX=0000  DX=0000  SP=00FD  BP=0000  SI=0000  DI=0000
DS=073F  ES=073F  SS=073F  CS=073F  IP=0103   OV UP EI NG NZ NA PO CY
073F:0103 BB84FF        MOV     BX,FF84
-T

AX=0004  BX=FF84  CX=0000  DX=0000  SP=00FD  BP=0000  SI=0000  DI=0000
DS=073F  ES=073F  SS=073F  CS=073F  IP=0106   OV UP EI NG NZ NA PO CY
073F:0106 29D8          SUB     AX,BX
-T

AX=0080  BX=FF84  CX=0000  DX=0000  SP=00FD  BP=0000  SI=0000  DI=0000
DS=073F  ES=073F  SS=073F  CS=073F  IP=0108   NV UP EI PL NZ NA PO CY
073F:0108 00BA8000      ADD     [BP+SI+0080],BH                 SS:0080=00
```

四、无符号数减法不借位

```
-A 100
073F:0100 MOV AL,D1
073F:0102 SUB AL,35
073F:0104
-U 100 103
073F:0100 B0D1          MOV     AL,D1
073F:0102 2C35          SUB     AL,35
-R IP
IP 0108
:100
-R
AX=0080  BX=FF84  CX=0000  DX=0000  SP=00FD  BP=0000  SI=0000  DI=0000
DS=073F  ES=073F  SS=073F  CS=073F  IP=0100   NV UP EI PL NZ NA PO CY
073F:0100 B0D1          MOV     AL,D1
```

```
-T

AX=00D1  BX=FF84  CX=0000  DX=0000  SP=00FD  BP=0000  SI=0000  DI=0000
DS=073F  ES=073F  SS=073F  CS=073F  IP=0102   NV UP EI PL NZ NA PO CY
073F:0102 2C35          SUB     AL,35
-T

AX=009C  BX=FF84  CX=0000  DX=0000  SP=00FD  BP=0000  SI=0000  DI=0000
DS=073F  ES=073F  SS=073F  CS=073F  IP=0104   NV UP EI NG NZ AC PE NC
073F:0104 84FF          TEST    BH,BH
```

五、无符号数减法不够剪，需要借位

```
DOSBox 0.74-3-3, Cpu speed:   3000 cycles, Frameskip  0, Program:   DEBUG
-A 100
073F:0100 MOV AL,35
073F:0102 SUB AL,58
073F:0104
-U 100 102
073F:0100 B035          MOV     AL,35
073F:0102 2C58          SUB     AL,58
-R IP
IP 0104
:100
-R
AX=009C  BX=FF84  CX=0000  DX=0000  SP=00FD  BP=0000  SI=0000  DI=0000
DS=073F  ES=073F  SS=073F  CS=073F  IP=0100   NV UP EI NG NZ AC PE NC
073F:0100 B035          MOV     AL,35
-T

AX=0035  BX=FF84  CX=0000  DX=0000  SP=00FD  BP=0000  SI=0000  DI=0000
DS=073F  ES=073F  SS=073F  CS=073F  IP=0102   NV UP EI NG NZ AC PE NC
073F:0102 2C58          SUB     AL,58
-T

AX=00DD  BX=FF84  CX=0000  DX=0000  SP=00FD  BP=0000  SI=0000  DI=0000
DS=073F  ES=073F  SS=073F  CS=073F  IP=0104   NV UP EI NG NZ AC PE CY
073F:0104 84FF          TEST    BH,BH
```

六、有符号数与无符号数的约定

```
-A 100
073F:0100 MOV AL,A6
073F:0102 MOV BL,3A
073F:0104 ADD AL,BL
073F:0106
-U 100 105
073F:0100 B0A6          MOV     AL,A6
073F:0102 B33A          MOV     BL,3A
073F:0104 00D8          ADD     AL,BL
-R IP
IP 0104
:100
-R
AX=00DD  BX=FF84  CX=0000  DX=0000  SP=00FD  BP=0000  SI=0000  DI=0000
DS=073F  ES=073F  SS=073F  CS=073F  IP=0100   NV UP EI NG NZ AC PE CY
073F:0100 B0A6          MOV     AL,A6
-T

AX=00A6  BX=FF84  CX=0000  DX=0000  SP=00FD  BP=0000  SI=0000  DI=0000
DS=073F  ES=073F  SS=073F  CS=073F  IP=0102   NV UP EI NG NZ AC PE CY
073F:0102 B33A          MOV     BL,3A
```

```
-T

AX=00A6  BX=FF3A  CX=0000  DX=0000  SP=00FD  BP=0000  SI=0000  DI=0000
DS=073F  ES=073F  SS=073F  CS=073F  IP=0104   NV UP EI NG NZ AC PE CY
073F:0104 00D8          ADD     AL,BL
-T

AX=00E0  BX=FF3A  CX=0000  DX=0000  SP=00FD  BP=0000  SI=0000  DI=0000
DS=073F  ES=073F  SS=073F  CS=073F  IP=0106   NV UP EI NG NZ AC PO NC
073F:0106 29D8          SUB     AX,BX
```

七、有符号数运算溢出

```
-A 100
073F:0100 MOV AL,55
073F:0102 ADD AL,78
073F:0104 MOV AL,C4
073F:0106 ADD AL,BL
073F:0108 MOV AL,23
073F:010A ADD AL,32
073F:010C MOV AL,FE
073F:010E ADD AL,FB
073F:0110
-U 100 10F
073F:0100 B055          MOV     AL,55
073F:0102 0478          ADD     AL,78
073F:0104 B0C4          MOV     AL,C4
073F:0106 00D8          ADD     AL,BL
073F:0108 B023          MOV     AL,23
073F:010A 0432          ADD     AL,32
073F:010C B0FE          MOV     AL,FE
073F:010E 04FB          ADD     AL,FB
-R IP
IP 0106
:100
```

```
-R
AX=00E0  BX=FF3A  CX=0000  DX=0000  SP=00FD  BP=0000  SI=0000  DI=0000
DS=073F  ES=073F  SS=073F  CS=073F  IP=0100   NV UP EI NG NZ AC PO NC
073F:0100 B055          MOV     AL,55
-T

AX=0055  BX=FF3A  CX=0000  DX=0000  SP=00FD  BP=0000  SI=0000  DI=0000
DS=073F  ES=073F  SS=073F  CS=073F  IP=0102   NV UP EI NG NZ AC PO NC
073F:0102 0478          ADD     AL,78
-T

AX=00CD  BX=FF3A  CX=0000  DX=0000  SP=00FD  BP=0000  SI=0000  DI=0000
DS=073F  ES=073F  SS=073F  CS=073F  IP=0104   OV UP EI NG NZ NA PO NC
073F:0104 B0C4          MOV     AL,C4
-T

AX=00C4  BX=FF3A  CX=0000  DX=0000  SP=00FD  BP=0000  SI=0000  DI=0000
DS=073F  ES=073F  SS=073F  CS=073F  IP=0106   OV UP EI NG NZ NA PO NC
073F:0106 00D8          ADD     AL,BL
-T

AX=00FE  BX=FF3A  CX=0000  DX=0000  SP=00FD  BP=0000  SI=0000  DI=0000
DS=073F  ES=073F  SS=073F  CS=073F  IP=0108   NV UP EI NG NZ NA PO NC
073F:0108 B023          MOV     AL,23
```

```
-T

AX=0023  BX=FF3A  CX=0000  DX=0000  SP=00FD  BP=0000  SI=0000  DI=0000
DS=073F  ES=073F  SS=073F  CS=073F  IP=010A   NV UP EI NG NZ NA PO NC
073F:010A 0432          ADD     AL,32
-T

AX=0055  BX=FF3A  CX=0000  DX=0000  SP=00FD  BP=0000  SI=0000  DI=0000
DS=073F  ES=073F  SS=073F  CS=073F  IP=010C   NV UP EI PL NZ NA PE NC
073F:010C B0FE          MOV     AL,FE
-T

AX=00FE  BX=FF3A  CX=0000  DX=0000  SP=00FD  BP=0000  SI=0000  DI=0000
DS=073F  ES=073F  SS=073F  CS=073F  IP=010E   NV UP EI PL NZ NA PE NC
073F:010E 04FB          ADD     AL,FB
-T

AX=00F9  BX=FF3A  CX=0000  DX=0000  SP=00FD  BP=0000  SI=0000  DI=0000
DS=073F  ES=073F  SS=073F  CS=073F  IP=0110   NV UP EI NG NZ AC PE CY
073F:0110 0000          ADD     [BX+SI],AL                  DS:FF3A=00
```

八、BCD 码运算的结果调整

```
DOSBox 0.74-3-3, Cpu speed:    3000 cycles, Frameskip  0, Program:   DEBUG
-A 100
073F:0100 MOV AL,19
073F:0102 ADD AL,08
073F:0104
-U 100 102
073F:0100 B019          MOV     AL,19
073F:0102 0408          ADD     AL,08
-R IP
IP 0110
:100
-R
AX=00F9  BX=FF3A  CX=0000  DX=0000  SP=00FD  BP=0000  SI=0000  DI=0000
DS=073F  ES=073F  SS=073F  CS=073F  IP=0100   NV UP EI NG NZ AC PE CY
073F:0100 B019          MOV     AL,19
-T

AX=0019  BX=FF3A  CX=0000  DX=0000  SP=00FD  BP=0000  SI=0000  DI=0000
DS=073F  ES=073F  SS=073F  CS=073F  IP=0102   NV UP EI NG NZ AC PE CY
073F:0102 0408          ADD     AL,08
-T

AX=0021  BX=FF3A  CX=0000  DX=0000  SP=00FD  BP=0000  SI=0000  DI=0000
DS=073F  ES=073F  SS=073F  CS=073F  IP=0104   NV UP EI PL NZ AC PE NC
073F:0104 B0C4          MOV     AL,C4
-A 104
073F:0104 DAA
073F:0105
-T

AX=0027  BX=FF3A  CX=0000  DX=0000  SP=00FD  BP=0000  SI=0000  DI=0000
DS=073F  ES=073F  SS=073F  CS=073F  IP=0105   NV UP EI PL NZ AC PE NC
073F:0105 C400          LES     AX,[BX+SI]                  DS:FF3A=0000
```