

```

-r ax
AX 0000
:ffff
-r bx
BX 0000
:1
-r
AX=FFFF BX=0001 CX=0000 DX=0000 SP=00FD BP=0000 SI=0000 DI=0000
DS=073F ES=073F SS=073F CS=073F IP=0100 NU UP EI PL NZ NA PO NC
073F:0100 0000 ADD [BX+SI],AL DS:0001=20
-a 100
073F:0100 add ax, bx
073F:0102
-r
AX=FFFF BX=0001 CX=0000 DX=0000 SP=00FD BP=0000 SI=0000 DI=0000
DS=073F ES=073F SS=073F CS=073F IP=0100 NU UP EI PL NZ NA PO NC
073F:0100 01D8 ADD AX,BX
-t
AX=0000 BX=0001 CX=0000 DX=0000 SP=00FD BP=0000 SI=0000 DI=0000
DS=073F ES=073F SS=073F CS=073F IP=0102 NU UP EI PL ZR AC PE CY
073F:0102 0000 ADD [BX+SI],AL DS:0001=20
-

```

```

-r ip
IP 0102
:100
-t
AX=0001 BX=0001 CX=0000 DX=0000 SP=00FD BP=0000 SI=0000 DI=0000
DS=073F ES=073F SS=073F CS=073F IP=0102 NU UP EI PL NZ NA PO NC
073F:0102 0000 ADD [BX+SI],AL DS:0001=20
-r ip
IP 0102
:100
-a 100
073F:0100 rcl bl, 1
073F:0102
-r bx
BX 0001
:b7
-t
AX=0001 BX=006E CX=0000 DX=0000 SP=00FD BP=0000 SI=0000 DI=0000
DS=073F ES=073F SS=073F CS=073F IP=0102 OU UP EI PL NZ NA PO CY
073F:0102 0000 ADD [BX+SI],AL DS:006E=20
-

```

```

AX=0001 BX=00DD CX=0000 DX=0000 SP=00FD BP=0000 SI=0000 DI=0000
DS=073F ES=073F SS=073F CS=073F IP=0102  OV UP EI PL NZ NA PO NC
073F:0102 0000          ADD     [BX+SI],AL          DS:00DD=00

```

```

-r ip
IP 0102
:100
-t

```

```

AX=0001 BX=00BA 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 0000          ADD     [BX+SI],AL          DS:00BA=00

```

```

-r ip 100
^ Error

```

```

-r ip
IP 0102
:100
-t

```

```

AX=0001 BX=0075 CX=0000 DX=0000 SP=00FD BP=0000 SI=0000 DI=0000
DS=073F ES=073F SS=073F CS=073F IP=0102  OV UP EI PL NZ NA PO CY
073F:0102 0000          ADD     [BX+SI],AL          DS:0075=20

```

```

-r ip
IP 0102
:100
-t

```

```

AX=0001 BX=00D6 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 0000          ADD     [BX+SI],AL          DS:00D6=00

```

```

-r ip
IP 0102
:100
-t

```

```

AX=0001 BX=00AD 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 0000          ADD     [BX+SI],AL          DS:00AD=00

```

```

-r ip
IP 0102
:100
-t

```

```

AX=0001 BX=005B CX=0000 DX=0000 SP=00FD BP=0000 SI=0000 DI=0000
DS=073F ES=073F SS=073F CS=073F IP=0102  OV UP EI PL NZ NA PO CY
073F:0102 0000          ADD     [BX+SI],AL          DS:005B=00

```

```

-r ip
IP 0102
:100
-t

```

```

AX=0001 BX=00B7 CX=0000 DX=0000 SP=00FD BP=0000 SI=0000 DI=0000
DS=073F ES=073F SS=073F CS=073F IP=0102  OV UP EI PL NZ NA PO NC
073F:0102 0000          ADD     [BX+SI],AL          DS:00B7=00

```

```

-a 102
073F:0102 adc dl, 30
073F:0105 mov dl, 00
073F:0107 rcl bl, 1
073F:0109 adc dl, 30
073F:010C mov ah, 02
073F:010E int 21
073F:0110 int 20
073F:0112
-t
AX=0001 BX=00B7 CX=0000 DX=0030 SP=00FD BP=0000 SI=0000 DI=0000
DS=073F ES=073F SS=073F CS=073F IP=0105  NU UP EI PL NZ NA PE NC
073F:0105 B200          MOV     DL,00
-t
AX=0001 BX=00B7 CX=0000 DX=0000 SP=00FD BP=0000 SI=0000 DI=0000
DS=073F ES=073F SS=073F CS=073F IP=0107  NU UP EI PL NZ NA PE NC
073F:0107 D0D3          RCL     BL,1
-t
AX=0001 BX=006E CX=0000 DX=0000 SP=00FD BP=0000 SI=0000 DI=0000
DS=073F ES=073F SS=073F CS=073F IP=0109  OU UP EI PL NZ NA PE CY
073F:0109 80D230        ADC     DL,30
-

```

```

0
AX=0230 BX=00DC CX=0000 DX=0030 SP=00FD BP=0000 SI=0000 DI=0000
DS=073F ES=073F SS=073F CS=073F IP=0110  NU UP EI PL NZ NA PE NC
073F:0110 00F0          ADD     AL,DH
-

```

```

-r ip
IP 0115
:100
-u 100
073F:0100 B402          MOV     AH,02
073F:0102 B22A          MOV     DL,2A
073F:0104 B90400        MOV     CX,0004
073F:0107 CD21          INT     21
073F:0109 E2FC          LOOP    0107
073F:010B CD20          INT     20
073F:010D 02CD          ADD     CL,CH
073F:010F 2100          AND     [BX+SI],AX
073F:0111 F0           LOCK
073F:0112 46           INC     SI
073F:0113 7400          JZ      0115
073F:0115 00B00000      ADD     [BX+SI+0000],DH
073F:0119 0091002E      ADD     [BX+DI+2E00],DL
073F:011D 07           POP     ES
073F:011E 2E           CS:
073F:011F 07           POP     ES
-

```

```

-t
AX=0230 BX=00DC CX=0000 DX=0030 SP=00FD BP=0000 SI=0001 DI=0000
DS=073F ES=073F SS=073F CS=073F IP=0102  NU UP EI PL NZ NA PO NC
073F:0102 B22A          MOV     DL,2A
-t

```

```

AX=0230 BX=00DC CX=0000 DX=002A SP=00FD BP=0000 SI=0001 DI=0000
DS=073F ES=073F SS=073F CS=073F IP=0104  NU UP EI PL NZ NA PO NC
073F:0104 B90400      MOV     CX,0004
-t

```

```

AX=0230 BX=00DC CX=0004 DX=002A SP=00FD BP=0000 SI=0001 DI=0000
DS=073F ES=073F SS=073F CS=073F IP=0107  NU UP EI PL NZ NA PO NC
073F:0107 CD21          INT     21
-g d
*****

```

```

-r ax
AX 0000
:20
-r bx
BX 0000
:10
-a 100
073F:0100 sub ax, bx
073F:0102 sub ax, bx
073F:0104
-r
AX=0020 BX=0010 CX=0000 DX=0000 SP=00FD BP=0000 SI=0000 DI=0000
DS=073F ES=073F SS=073F CS=073F IP=0100  NU UP EI PL NZ NA PO NC
073F:0100 29D8          SUB     AX,BX
-t
AX=0010 BX=0010 CX=0000 DX=0000 SP=00FD BP=0000 SI=0000 DI=0000
DS=073F ES=073F SS=073F CS=073F IP=0102  NU UP EI PL NZ NA PO NC
073F:0102 29D8          SUB     AX,BX
-t
AX=0000 BX=0010 CX=0000 DX=0000 SP=00FD BP=0000 SI=0000 DI=0000
DS=073F ES=073F SS=073F CS=073F IP=0104  NU UP EI PL ZR NA PE NC
073F:0104 0000          ADD     [BX+SI],AL          DS:0010=A3
-

```

```

-r ip
IP 0104
:100
-r ax
AX 8000
:8000
-r bx
BX 0001
:8000
-r
AX=8000 BX=8000 CX=0000 DX=0000 SP=00FD BP=0000 SI=0000 DI=0000
DS=073F ES=073F SS=073F CS=073F IP=0100  NU UP EI NG NZ NA PE NC
073F:0100 01D8          ADD     AX,BX
-t
AX=0000 BX=8000 CX=0000 DX=0000 SP=00FD BP=0000 SI=0000 DI=0000
DS=073F ES=073F SS=073F CS=073F IP=0102  OU UP EI PL ZR NA PE CY
073F:0102 29D8          SUB     AX,BX
-

```

```

-r ax
AX 0000
:4b
-r bx
BX 8000
:4b
-a 102
073F:0102 cmp ax, bx
073F:0104
-r
AX=004B BX=004B CX=0000 DX=0000 SP=00FD BP=0000 SI=0000 DI=0000
DS=073F ES=073F SS=073F CS=073F IP=0102  OU UP EI PL ZR NA PE CY
073F:0102 39D8          CMP     AX,BX
-
-t
AX=004B BX=004B CX=0000 DX=0000 SP=00FD BP=0000 SI=0000 DI=0000
DS=073F ES=073F SS=073F CS=073F IP=0104  NU UP EI PL ZR NA PE NC
073F:0104 0000          ADD     [BX+SI],AL          DS:004B=00
-

```

```

C:\>debug
-a 100
073F:0100 sub al, 1
073F:0102 jnz 100
073F:0104 int 20
073F:0106
-r ax
AX 0000
:5
-t

AX=0004 BX=0000 CX=0000 DX=0000 SP=00FD BP=0000 SI=0000 DI=0000
DS=073F ES=073F SS=073F CS=073F IP=0102  NU UP EI PL NZ NA PO NC
073F:0102 75FC          JNZ      0100
-t

AX=0004 BX=0000 CX=0000 DX=0000 SP=00FD BP=0000 SI=0000 DI=0000
DS=073F ES=073F SS=073F CS=073F IP=0100  NU UP EI PL NZ NA PO NC
073F:0100 2C01          SUB      AL,01
-t

AX=0003 BX=0000 CX=0000 DX=0000 SP=00FD BP=0000 SI=0000 DI=0000
DS=073F ES=073F SS=073F CS=073F IP=0102  NU UP EI PL NZ NA PE NC
073F:0102 75FC          JNZ      0100

```

```

AX=0003 BX=0000 CX=0000 DX=0000 SP=00FD BP=0000 SI=0000 DI=0000
DS=073F ES=073F SS=073F CS=073F IP=0102  NU UP EI PL NZ NA PE NC
073F:0102 75FC          JNZ      0100
-t

AX=0003 BX=0000 CX=0000 DX=0000 SP=00FD BP=0000 SI=0000 DI=0000
DS=073F ES=073F SS=073F CS=073F IP=0100  NU UP EI PL NZ NA PE NC
073F:0100 2C01          SUB      AL,01
-t

AX=0002 BX=0000 CX=0000 DX=0000 SP=00FD BP=0000 SI=0000 DI=0000
DS=073F ES=073F SS=073F CS=073F IP=0102  NU UP EI PL NZ NA PO NC
073F:0102 75FC          JNZ      0100
-t

AX=0002 BX=0000 CX=0000 DX=0000 SP=00FD BP=0000 SI=0000 DI=0000
DS=073F ES=073F SS=073F CS=073F IP=0100  NU UP EI PL NZ NA PO NC
073F:0100 2C01          SUB      AL,01
-t

AX=0001 BX=0000 CX=0000 DX=0000 SP=00FD BP=0000 SI=0000 DI=0000
DS=073F ES=073F SS=073F CS=073F IP=0102  NU UP EI PL NZ NA PO NC
073F:0102 75FC          JNZ      0100

```

```

DS=073F ES=073F SS=073F CS=073F IP=0102  NU UP EI PL NZ NA PO NC
073F:0102 75FC          JNZ     0100
-q
C:\>debug
-a 100
073F:0100 mov dl, b1
073F:0102 cmp dl, 09
073F:0105 ja 10c
073F:0107 add dl, 30
073F:010A jmp 10f
073F:010C add dl, 37
073F:010F mov ah, 02
073F:0111 int 21
073F:0113 int 20
073F:0115
-r bx
BX 0000
:9
-g 113
9
AX=0239 BX=0009 CX=0000 DX=0039 SP=00FD BP=0000 SI=0000 DI=0000
DS=073F ES=073F SS=073F CS=073F IP=0113  NU UP EI PL NZ NA PE NC
073F:0113 CD20          INT     20
-

```

```

-r ip
IP 0113
:100
-r bx
BX 0009
:f
-g 113
F
AX=0246 BX=000F CX=0000 DX=0046 SP=00FD BP=0000 SI=0000 DI=0000
DS=073F ES=073F SS=073F CS=073F IP=0113  NU UP EI PL NZ AC PO NC
073F:0113 CD20          INT     20
-

```

```

-a 100
073F:0100 shr dl, cl
073F:0102
-r cl
br Error
-r cx
CX 0000
:4
-r dx
DX 0000
:5d
-r
AX=0000 BX=0000 CX=0004 DX=005D SP=00FD BP=0000 SI=0000 DI=0000
DS=073F ES=073F SS=073F CS=073F IP=0100 NU UP EI PL NZ NA PO NC
073F:0100 D2EA SHR DL,CL
-t
AX=0000 BX=0000 CX=0004 DX=0005 SP=00FD BP=0000 SI=0000 DI=0000
DS=073F ES=073F SS=073F CS=073F IP=0102 NU UP EI PL NZ AC PE CY
073F:0102 80FA09 CMP DL,09
-

```

```

-a 100
073F:0100 mov dl, b1
073F:0102 and dl, 0f
073F:0105 cmp dl, 09
073F:0108 ja 10f
073F:010A add dl, 30
073F:010D jmp 112
073F:010F add dl, 37
073F:0112 mov ah, 02
073F:0114 int 21
073F:0116 int 20
073F:0118
-r bx
BX 0000
:5a
-g 116
A
AX=0241 BX=005A CX=0004 DX=0041 SP=00FD BP=0000 SI=0000 DI=0000
DS=073F ES=073F SS=073F CS=073F IP=0116 NU UP EI PL NZ AC PE NC
073F:0116 CD20 INT 20
-

```



```

-a 100
073F:0100 int 21
073F:0102
-r ax
AX 0000
:100
-r
AX=0100 BX=0000 CX=0000 DX=0000 SP=00FD BP=0000 SI=0000 DI=0000
DS=073F ES=073F SS=073F CS=073F IP=0100  NU UP EI PL NZ NA PO NC
073F:0100 CD21          INT     21
-g 102
h
AX=0168 BX=0000 CX=0000 DX=0000 SP=00FD BP=0000 SI=0000 DI=0000
DS=073F ES=073F SS=073F CS=073F IP=0102  NU UP EI PL NZ NA PO NC
073F:0102 80E20F          AND    DL,0F
-

```

```

-a 102
073F:0102 cmp al, 39
073F:0104 jbe 10b
073F:0106 sub al, 30
073F:0108 jmp 10e
073F:010A
-a 104
073F:0104 jbe 10a
073F:0106 sub al, 30
073F:0108 jmp 10d
073F:010A sub al, 37
073F:010C
-r ip
IP 0102
:100
-g 10c
5
AX=01FE BX=0000 CX=0000 DX=0000 SP=00FD BP=0000 SI=0000 DI=0000
DS=073F ES=073F SS=073F CS=073F IP=010C  NU UP EI NG NZ AC PO CY
073F:010C 30EB          XDR     BL,CH
-a 106
073F:0106 sub al, 37
073F:0108 jmp 10d
073F:010A sub al, 30
073F:010C

```

```

-r ip
IP 010C
:100
-g 10c
5
AX=0105 BX=0000 CX=0000 DX=0000 SP=00FD BP=0000 SI=0000 DI=0000
DS=073F ES=073F SS=073F CS=073F IP=010C  NU UP EI PL NZ NA PE NC
073F:010C 30EB          XDR     BL,CH
-

```

```

073F:0104 jbe 10b
073F:0106 sub al, 30
073F:0108 jmp 10e
073F:010A
-a 104
073F:0104 jbe 10a
073F:0106 sub al, 37
073F:0108 jmp 10d
073F:010A sub al, 30
073F:010C mov dl, al
073F:010E sub dl, 10
073F:0111 int 21
073F:0113 cmp al, 39
073F:0115 jbe 11b
073F:0117 sub al, 37
073F:0119 jmp 10
073F:011C
-a 108
073F:0108 jmp 10c
073F:010A sub al, 30
073F:010C mov dl, al
073F:010E mul dl, 10
073F:0110 int 21
073F:0112 cmp al, 39
073F:0114 jbe

```

```

073F:0114 jbe 11a
073F:0116 sub al, 37
073F:0118 jmp 11c
073F:011A sub al, 30
073F:011C add dl, al
073F:011E

```

```

-a 100
073F:0100 mov dl, 41
073F:0102 mov cx, a
073F:0105 call 200
073F:0108 loop 105
073F:010A int 20
073F:010C
-a 200
073F:0200 mov ah, 02
073F:0202 int 21
073F:0204 inc dl
073F:0206 ret
073F:0207
-g 10a
ABCDEFGHIJ
AX=024A BX=0000 CX=0000 DX=004B SP=00FD BP=0000 SI=0000 DI=0000
DS=073F ES=073F SS=073F CS=073F IP=010A NU UP EI PL NZ NA PE NC
073F:010A CD20 INT 20
-

```

```

AX=024A BX=0000 CX=000A DX=0041 SP=00FB BP=0000 SI=0000 DI=0000
DS=073F ES=073F SS=073F CS=073F IP=0200  NU UP EI PL NZ NA PE NC
073F:0200 B402          MDU    AH,02

```

```

-u debug
  ^ Error

```

```

-u
073F:0200 B402          MDU    AH,02
073F:0202 CD21          INT     21
073F:0204 FEC2          INC     DL
073F:0206 C3            RET
073F:0207 0000          ADD     [BX+SI],AL
073F:0209 0000          ADD     [BX+SI],AL
073F:020B 0000          ADD     [BX+SI],AL
073F:020D 0000          ADD     [BX+SI],AL
073F:020F 0000          ADD     [BX+SI],AL
073F:0211 0000          ADD     [BX+SI],AL
073F:0213 0000          ADD     [BX+SI],AL
073F:0215 0000          ADD     [BX+SI],AL
073F:0217 0000          ADD     [BX+SI],AL
073F:0219 0000          ADD     [BX+SI],AL
073F:021B 0000          ADD     [BX+SI],AL
073F:021D 0000          ADD     [BX+SI],AL
073F:021F 0000          ADD     [BX+SI],AL

```

```

073F:00F0  00 00 00 00 00 00 02 3F-07 A3 01 08 01 00 00 02  .....?.....
073F:0100  B2 41 B9 0A 00 E8 F8 00-E2 FB CD 20 00 00 AE FE  .A.....
073F:0110  00 F0 93 74 00 00 2C F6-D4 09 5E 00 2E 07 2E 07  ...t...^....
073F:0120  00 00 00 00 00 00 00 00-00 00 00 00 00 00 00 00  .....
073F:0130  00 00 00 00 00 00 00 00-00 00 00 00 00 00 00 00  .....
073F:0140  00 00 00 00 00 00 00 00-00 00 00 00 00 00 00 00  .....
073F:0150  00 00 00 00 00 00 00 00-00 00 00 00 00 00 00 00  .....
073F:0160  00 00 00 00 00 00 00 00-00 00 00 00 00 00 00 00  .....

```

```

-a 200
073F:0200 mov ah, 02
073F:0202 int 21
073F:0204 inc dl
073F:0206 call 300
073F:0209 ret
073F:020A
-a 300
073F:0300 mov ah, 02
073F:0302 int 21
073F:0304 inc dl
073F:0306 call 400
073F:0309 ret
073F:030A
-a 400
073F:0400 int 21
073F:0402 ret
073F:0403

```

```
073F:0100 call 200
073F:0103 int 20
073F:0105
-a 200
073F:0200 push dx
073F:0201 mov ah, 8
073F:0203 int 21
073F:0205 mov dl, al
073F:0207 cmp al, 30
073F:0209 jb 221
073F:020B cmp al, 39
073F:020D ja 214
073F:020F sub al, 30
073F:0211 cld
073F:0212 jmp 222
073F:0214 cmp al, 41
073F:0216 jb 221
073F:0218 cmp al, 46
073F:021A ja 221
073F:021C sub al, 37
073F:021E cld
073F:021F jmp 222
073F:0221 stc
073F:0222 jc 203
073F:0224 mov bl, al_
```

```
073F:0226 mov ah, 2
073F:0228 int 21
073F:022A pop dx
073F:022B ret
073F:022C
-r ip
IP 0200
:100
-
```

```
-r ip
IP 0200
:100
-t

AX=024A BX=0000 CX=000A DX=0041 SP=00F9 BP=0000 SI=0000 DI=0000
DS=073F ES=073F SS=073F CS=073F IP=0200  NU UP EI PL NZ NA PE NC
073F:0200 52          PUSH    DX
-t

AX=024A BX=0000 CX=000A DX=0041 SP=00F7 BP=0000 SI=0000 DI=0000
DS=073F ES=073F SS=073F CS=073F IP=0201  NU UP EI PL NZ NA PE NC
073F:0201 B408          MOV     AH,08
-t

AX=084A BX=0000 CX=000A DX=0041 SP=00F7 BP=0000 SI=0000 DI=0000
DS=073F ES=073F SS=073F CS=073F IP=0203  NU UP EI PL NZ NA PE NC
073F:0203 CD21          INT     21
-p
```