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COAL LAB TASK #09

Multiplying Larger Numbers:

When multiplying large numbers, we encounter a limitation due to the fixed register size (16 or 32 bits). Standard shift operations (SHL, SHR) can only manipulate bits within the register size, leading to significant bits being dropped or lost when shifting larger numbers. This results in incorrect products. For instance, multiplying two 16-bit numbers can yield a 32-bit result, but our 16-bit registers can't accommodate this. Therefore, we need to develop a strategy to store and process partial products without overflowing the registers, ensuring accurate multiplication of large numbers.

Extended Shifting

To address the memory limitation, we employ extended shifting techniques, which enable us to manipulate and process larger numbers beyond the standard register size, ensuring accurate calculations and preventing data overflow.

The Algorithm

The extended shifting algorithm utilizes two essential instructions - SHL (Shift Left) and RCL (Rotate Carry Left) - to facilitate the efficient shifting of 32-bit numbers by 16 bits to the left, while meticulously preserving all significant bits and preventing any data loss during the process.

num1: dd 40000

shl word [num1],1

rcl word [num1+2], 1

word [num1+2], 1

In this scenario, num1 is a 32-bit number stored in memory, and we employ the SHL instruction to shift its lower 16 bits to the left, while the most significant bit is captured in the carry. Subsequently, the RCL instruction cleverly inserts this carried bit into the least significant bit position of the adjacent word, effectively concatenating the two 16-bit words and preserving the entire 32-bit value.

Conversely, when shifting right, the process is inverted. The SHR (Shift Right) and RCR (Rotate Carry Right) instructions are employed to guarantee the preservation of all significant bits, preventing any data loss during the rightward shift.

num1: dd 40000

shr word [num1+2], 1

rcr word [num1], 1

word [num1], 1

ADC (Add with Carry):

Adds two numbers and the carry flag.

Code:

[org 0x0100]

jmp start

 multiplicand: dd 1300

 multiplier: dw 500

 result: dd 0

start: mov cl, 16

 mov dx, [multiplier]

 checkbit: shr dx, 1

 jnc skip

```
mov ax, [multiplicand]
add [result], ax
mov ax, [multiplicand+2]
adc [result+2], ax
skip: shl word [multiplicand], 1
rcl word [multiplicand+2], 1
dec cl
jnz checkbit
mov ax, 0x4c00
```

Code Explanation:

- 1. [org 0x0100]:** This line specifies the origin of the code, setting the starting address to 0x0100.
- 2. jmp start:** This line jumps to the label "start", which marks the beginning of the main code.
- 3. multiplicand: dd 1300:** This line declares a 32-bit data element named "multiplicand" and initializes it with the value 1300. The "dd" directive stands for "define doubleword".
- 4. multiplier: dw 500:** This line declares a 16-bit data element named "multiplier" and initializes it with the value 500. The "dw" directive stands for "define word".
- 5. result: dd 0:** This line declares a 32-bit data element named "result" and initializes it with the value 0.

6. start: mov cl, 16: This line moves the value 16 into the CL register, which will be used as a bit counter.

7. mov dx, [multiplier]: This line loads the value of the "multiplier" into the DX register.

8. checkbit: shr dx, 1: This line shifts the contents of the DX register one bit to the right, moving the rightmost bit into the carry flag.

9. jnc skip: This line jumps to the label "skip" if the carry flag is zero (i.e., the rightmost bit was zero).

10. mov ax, [multiplicand]: This line loads the less significant word of the "multiplicand" into the AX register.

11. add [result], ax: This line adds the contents of the AX register to the less significant word of the "result".

12. mov ax, [multiplicand+2]: This line loads the more significant word of the "multiplicand" into the AX register.

13. adc [result+2], ax: This line adds the contents of the AX register to the more significant word of the "result", using the carry from the previous addition.

14. skip: shl word [multiplicand], 1: This line shifts the contents of the "multiplicand" one bit to the left.

15. rcl word [multiplicand+2], 1: This line rotates the contents of the more significant word of the "multiplicand" one bit to the left, moving the leftmost bit into the carry flag.

16. dec cl: This line decrements the bit counter in the CL register.

17. jnz checkbit: This line jumps back to the label "checkbit" if the bit counter is not zero, repeating the process until all bits have been processed.

18. mov ax, 0x4c00: This line moves the value 0x4c00 into the AX register, which is likely used to terminate the program.

First Iteration:

skip: shl word [multiplicand], 1

This instruction performs a left shift operation on the lower 16 bits of the multiplicand, effectively moving all bits one position to the left. As a result, the leftmost bit is transferred to the carry flag, while the rightmost bit is replaced with a zero, effectively multiplying the multiplicand by 2.

Before: 0000010110100100

After: 0000101000101000 (binary representation after shifting left by one) in hex A28

DOSBox 0.74-3, Cpu speed: 3000 cycles, Fram...

AX 0000	SI 0000	CS 19F5	IP 0129	Stack +0 0000	Flags 7214
BX 0000	DI 0000	DS 19F5		+2 20CD	
CX 0010	BP 0000	ES 19F5	HS 19F5	+4 9FFF	OF DF IF SF ZF AF PF CF
DX 00FA	SP FFFE	SS 19F5	FS 19F5	+6 EA00	0 0 1 0 0 1 1 0

CMD >

0000

0125 D1260301	SHL	W/[0103],1	1	0	1	2	3	4	5	6	7
0129 D1160501	RCL	W/[0105],1	DS:0000	CD	20	FF	9F	00	EA	F0	FE
012D FEC9	DEC	CL	DS:0008	AD	DE	1B	05	C5	06	00	00
012F 75E2	JNZ	0113	DS:0010	18	01	10	01	18	01	92	01
0131 B8004C	MOV	AX,4C00	DS:0018	01	01	01	00	02	FF	FF	FF
0134 85D2	TEST	DX,DX	DS:0020	FF	FF	FF	FF	FF	FF	FF	FF
0136 7504	JNZ	013C	DS:0028	FF	FF	FF	FF	EB	19	C0	11
0138 85C0	TEST	AX,AX	DS:0030	A2	01	14	00	18	00	F5	19
013A 741C	JZ	0158	DS:0038	FF	FF	FF	FF	00	00	00	00
			DS:0040	05	00	00	00	00	00	00	00
			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
DS:0010	18	01	10	01	18	01	92	01	01	01	01	00	02	FF	FF	FF
DS:0020	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	EB	19	C0	11
DS:0030	A2	01	14	00	18	00	F5	19	FF	FF	FF	FF	00	00	00	00
DS:0040	05	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00

1 Step

2 ProcStep

3 Retrieve

4 Help ON

5 BRK Menu

6

7 up

8 dn

9 le

10 ri

rcl word [multiplicand+2], 1

This instruction rotates the carry flag into the least significant bit of the upper 16 bits of the multiplicand, effectively inserting the carried bit into the most significant bit position. Since the carry flag was not set by the previous shift operation, the upper 16 bits of the multiplicand remain unchanged:

- Before rotation: 0000000000000000
- After rotation: 0000000000000000

dec cl;

The bit counter is decremented by 1.

jnz checkbit;

If there are still bits left to process (i.e., the bit counter is not zero), the program jumps back to the 'checkbit' label to repeat the process.

DOSBox 0.74-3, Cpu speed: 3000 cycles, Fram...

Register	Value	Register	Value	Register	Value	Register	Value	Stack	Flags
AX	0000	SI	0000	CS	19F5	IP	0125	+0	0000
BX	0000	DI	0000	DS	19F5			+2	20CD
CX	0010	BP	0000	ES	19F5	HS	19F5	+4	9FFF
DX	00FA	SP	FFFE	SS	19F5	FS	19F5	+6	EA00

Flags: 7214

CMD >

Address	Instruction	Comment
0115	730E	JNC 0125
0125	D1260301	SHL W/[0103],1
0129	D1160501	RCL W/[0105],1
012D	FEC9	DEC CL
012F	75E2	JNZ 0113
0131	B8004C	MOV AX,4C00
0134	85D2	TEST DX,DX
0136	7504	JNZ 013C
0138	85C0	TEST AX,AX

Address	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
DS:0010	18	01	10	01	18	01	92	01
DS:0018	01	01	01	00	02	FF	FF	FF
DS:0020	FF	FF	FF	FF	FF	FF	FF	FF
DS:0028	FF	FF	FF	FF	EB	19	C0	11
DS:0030	A2	01	14	00	18	00	F5	19
DS:0038	FF	FF	FF	FF	00	00	00	00
DS:0040	05	00	00	00	00	00	00	00
DS:0048	00	00	00	00	00	00	00	00

Address	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
DS:0010	18	01	10	01	18	01	92	01	01	01	01	00	02	FF	FF	FF
DS:0020	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	EB	19	C0	11
DS:0030	A2	01	14	00	18	00	F5	19	FF	FF	FF	FF	00	00	00	00
DS:0040	05	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00

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

Iteration 2:

DOSBox 0.74-3, Cpu speed: 3000 cycles, Fram...

AX 0000	SI 0000	CS 19F5	IP 012D	Stack +0 0000	Flags 7214
BX 0000	DI 0000	DS 19F5		+2 20CD	
CX 0010	BP 0000	ES 19F5	HS 19F5	+4 9FFF	OF DF IF SF ZF AF PF CF
DX 00FA	SP FFFE	SS 19F5	FS 19F5	+6 EA00	0 0 1 0 0 1 1 0

CMD >

0129 D1160501	RCL	W/[0105],1	1	0	1	2	3	4	5	6	7
012D FEC9	DEC	CL	DS:0000	CD	20	FF	9F	00	EA	F0	FE
012F 75E2	JNZ	0113	DS:0008	AD	DE	1B	05	C5	06	00	00
0131 B8004C	MOV	AX,4C00	DS:0010	18	01	10	01	18	01	92	01
0134 85D2	TEST	DX,DX	DS:0018	01	01	01	00	02	FF	FF	FF
0136 7504	JNZ	013C	DS:0020	FF	FF	FF	FF	FF	FF	FF	FF
0138 85C0	TEST	AX,AX	DS:0028	FF	FF	FF	FF	EB	19	C0	11
013A 741C	JZ	0158	DS:0030	A2	01	14	00	18	00	F5	19
013C C746DC0000	MOV	[BP-24],0000	DS:0038	FF	FF	FF	FF	00	00	00	00
			DS:0040	05	00	00	00	00	00	00	00
			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
DS:0010	18	01	10	01	18	01	92	01	01	01	01	00	02	FF	FF	FF
DS:0020	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	EB	19	C0	11
DS:0030	A2	01	14	00	18	00	F5	19	FF	FF	FF	FF	00	00	00	00
DS:0040	05	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00


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

Iteration 3:

multiplicand : 0000000001111101

After shift right carry flag is set.


DOSBox 0.74-3, Cpu speed: 3000 cycles, Fram...

AX 0000	SI 0000	CS 19F5	IP 0115	Stack +0 0000	Flags 7214
BX 0000	DI 0000	DS 19F5		+2 20CD	
CX 000F	BP 0000	ES 19F5	HS 19F5	+4 9FFF	OF DF IF SF ZF AF PF CF
DX 007D	SP FFFE	SS 19F5	FS 19F5	+6 EA00	0 0 1 0 0 1 1 0

CMD >

0113 D1EA	SHR	DX,1	
0115 730E	JNC	0125	
0117 A10301	MOV	AX,[0103]	
011A 01060901	ADD	[0109],AX	
011E A10501	MOV	AX,[0105]	
0121 11060B01	ADC	[010B],AX	
0125 D1260301	SHL	W/[0103],1	
0129 D1160501	RCL	W/[0105],1	
012D FEC9	DEC	CL	

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	
DS:0010	18	01	10	01	18	01	92	01	
DS:0018	01	01	01	00	02	FF	FF	FF	
DS:0020	FF	FF	FF	FF	FF	FF	FF	FF	
DS:0028	FF	FF	FF	FF	EB	19	C0	11	
DS:0030	A2	01	14	00	18	00	F5	19	
DS:0038	FF	FF	FF	FF	00	00	00	00	
DS:0040	05	00	00	00	00	00	00	00	
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
DS:0010	18	01	10	01	18	01	92	01	01	01	01	00	02	FF	FF	FF
DS:0020	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	EB	19	C0	11
DS:0030	A2	01	14	00	18	00	F5	19	FF	FF	FF	FF	00	00	00	00
DS:0040	05	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00

= f.Ω≡■ i |..†...
.....ff. δ.L.
ó.....J.
.....

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

Addition:

mov ax, [multiplicand]

add [result], ax ; add less significant word

mov ax, [multiplicand+2]

adc [result+2], ax ; add more significant word

mov the multiplicand to ax

DOSBox 0.74-3, Cpu speed: 3000 cycles, Fram... — □ ×

AX 1450 SI 0000 CS 19F5 IP 011A Stack +0 0000 Flags 7211

BX 0000 DI 0000 DS 19F5 +2 20CD

CX 000E BP 0000 ES 19F5 HS 19F5 +4 9FFF 0F DF IF SF ZF AF PF CF

DX 003E SP FFFE SS 19F5 FS 19F5 +6 EA00 0 0 1 0 0 1 0 1

CMD >

0117 A10301 MOU AX,[0103]

011A 01060901 ADD [0109],AX

011E A10501 MOU AX,[0105]

0121 11060B01 ADC [010B],AX

0125 D1260301 SHL W/[0103],1

0129 D1160501 RCL W/[0105],1

012D FEC9 DEC CL

012F 75E2 JNZ 0113

0131 B8004C MOU AX,4C00

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

DS:0010 18 01 10 01 18 01 92 01

DS:0018 01 01 01 00 02 FF FF FF

DS:0020 FF FF FF FF FF FF FF FF

DS:0028 FF FF FF FF EB 19 C0 11

DS:0030 A2 01 14 00 18 00 F5 19

DS:0038 FF FF FF FF 00 00 00 00

DS:0040 05 00 00 00 00 00 00 00

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

DS:0010 18 01 10 01 18 01 92 01 01 01 01 00 02 FF FF FF

DS:0020 FF FF FF FF FF FF FF FF FF FF FF FF EB 19 C0 11

DS:0030 A2 01 14 00 18 00 F5 19 FF FF FF FF 00 00 00 00

DS:0040 05 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

multiplicand 0001010001010000

add [result], ax ;

1

0 1 2 3 4 5 6 7

DS:0100 E9 0A 00 50 14 00 00 F4

DS:0108 01 50 14 00 00 B1 10 8B

DS:0110 16 07 01 D1 EA 73 0E A1

DS:0118 03 01 01 06 09 01 A1 05

DS:0120 01 11 06 0B 01 D1 26 03

DS:0128 01 D1 16 05 01 FE C9 75


DS:0130 E2 B8 00 4C 85 D2 75 04

DS:0138 85 C0 74 1C C7 46 DC 00

DS:0140 00 8E 5E FC 83 7D 0E 00

DS:0148 74 09 8B 46 F2 48 3B 46

mov ax, [multiplicand+2]


DOSBox 0.74-3, Cpu speed: 3000 cycles, Fram...
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□
×

AX	FFD4	SI	0000	CS	19F5	IP	0121	Stack	+0 0000	Flags	7210
BX	0000	DI	0000	DS	0108				+2 20CD		
CX	000C	BP	0000	ES	19F5	HS	19F5		+4 9FFF	OF	DF IF SF ZF AF PF CF
DX	000F	SP	FFFE	SS	19F5	FS	19F5		+6 EA00	0	0 1 0 0 1 0 0

CMD >

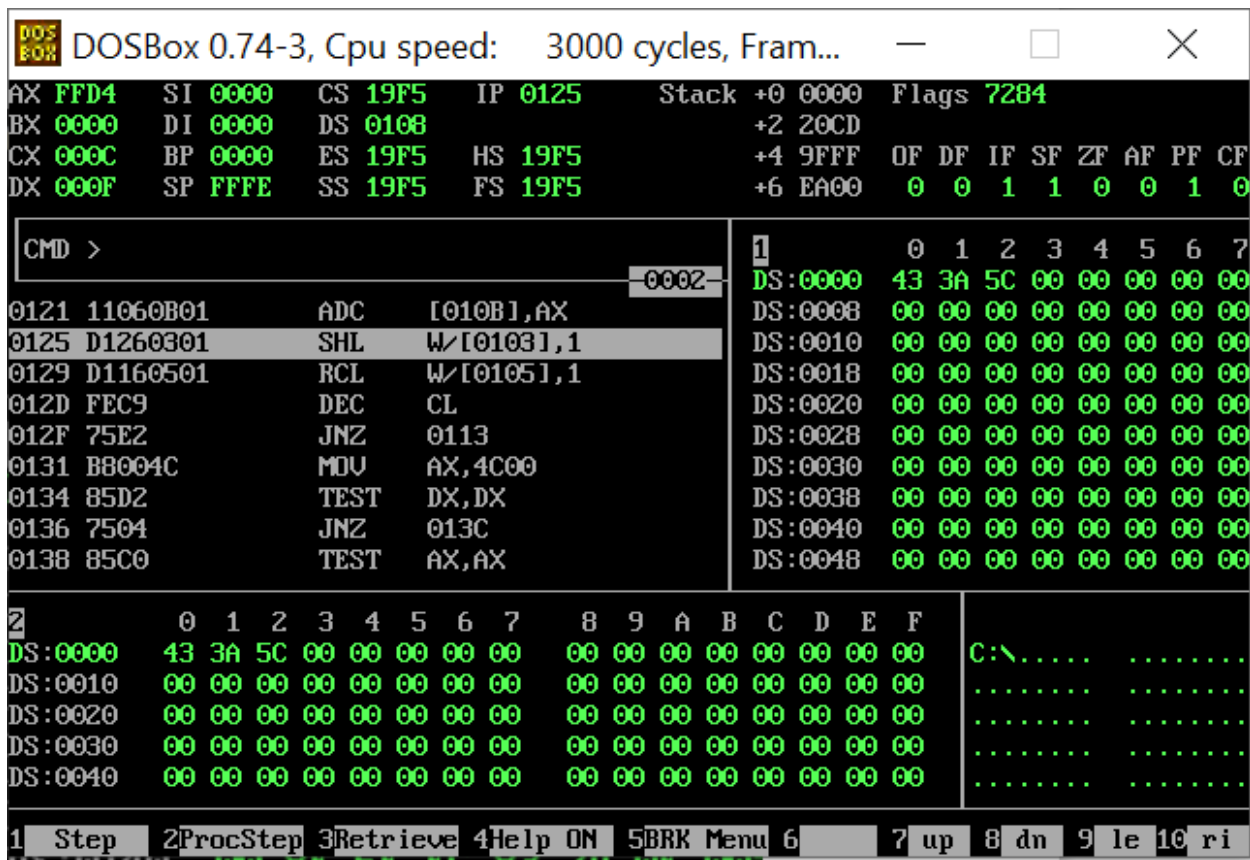
0010

011E	A10501	MOV	AX,[0105]	DS:0000	43 3A 5C 00 00 00 00 00
0121	11060B01	ADC	[010B],AX	DS:0008	00 00 00 00 00 00 00 00
0125	D1260301	SHL	W/[0103],1	DS:0010	00 00 00 00 00 00 00 00
0129	D1160501	RCL	W/[0105],1	DS:0018	00 00 00 00 00 00 00 00
012D	FEC9	DEC	CL	DS:0020	00 00 00 00 00 00 00 00
012F	75E2	JNZ	0113	DS:0028	00 00 00 00 00 00 00 00
0131	B8004C	MOV	AX,4C00	DS:0030	00 00 00 00 00 00 00 00
0134	85D2	TEST	DX,DX	DS:0038	00 00 00 00 00 00 00 00
0136	7504	JNZ	013C	DS:0040	00 00 00 00 00 00 00 00
				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	C:\.....
DS:0000	43	3A	5C	00	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	00	00	00	00	00	00	00	00
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
2 ProcStep
3 Retrieve
4 Help ON
5 BRK Menu
6
7 up
8 dn
9 le
10 ri

adc [result+2], ax ; add more significant word



DOSBox 0.74-3, Cpu speed: 3000 cycles, Fram...										—		□		✕													
AX	FFD4	SI	0000	CS	19F5	IP	012D	Stack	+0 0000	Flags	7211																
BX	0000	DI	0000	DS	0108				+2 20CD																		
CX	000C	BP	0000	ES	19F5	HS	19F5		+4 9FFF	OF	DF	IF	SF	ZF	AF	PF	CF										
DX	000F	SP	FFFE	SS	19F5	FS	19F5		+6 EA00	0	0	1	0	0	1	0	1										
CMD >																											
0129 D1160501 RCL W[0105],1										1 0 1 2 3 4 5 6 7																	
012D FEC9 DEC CL										DS:0000 43 3A 5C 00 00 00 00 00 00																	
012F 75E2 JNZ 0113										DS:0008 00 00 00 00 00 00 00 00 00																	
0131 B8004C MOV AX,4C00										DS:0010 00 00 00 00 00 00 00 00 00																	
0134 85D2 TEST DX,DX										DS:0018 00 00 00 00 00 00 00 00 00																	
0136 7504 JNZ 013C										DS:0020 00 00 00 00 00 00 00 00 00																	
0138 85C0 TEST AX,AX										DS:0028 00 00 00 00 00 00 00 00 00																	
013A 741C JZ 0158										DS:0030 00 00 00 00 00 00 00 00 00																	
013C C746DC0000 MOV [BP-24],0000										DS:0038 00 00 00 00 00 00 00 00 00																	
										DS:0040 00 00 00 00 00 00 00 00 00																	
										DS:0048 00 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 43 3A 5C 00 00 00 00 00 00 00 00 00 00 00 00										C:\.....																	
DS:0010 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 00 00 00 00 00 00 00																										
DS:0030 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																										
1 Step										2ProcStep		3Retrieve		4Help ON		5BRK Menu		6		7 up		8 dn		9 le		10 ri	

Iteration 4:

DOSBox 0.74-3, Cpu speed: 3000 cycles, Fram... — □ ×																
AX	FFD4	SI	0000	CS	19F5	IP	012D	Stack	+0	0000	Flags	7211				
BX	0000	DI	0000	DS	0108				+2	20CD						
CX	000C	BP	0000	ES	19F5	HS	19F5		+4	9FFF	OF	DF	IF	SF		
DX	000F	SP	FFFE	SS	19F5	FS	19F5		+6	EA00	0	0	1	0		
CMD >								1	0	1	2	3	4	5	6	7
0129 D1160501 RCL W/[0105],1								DS:0000	43	3A	5C	00	00	00	00	00
012D FEC9 DEC CL								DS:0008	00	00	00	00	00	00	00	00
012F 75E2 JNZ 0113								DS:0010	00	00	00	00	00	00	00	00
0131 B8004C MOV AX,4C00								DS:0018	00	00	00	00	00	00	00	00
0134 85D2 TEST DX,DX								DS:0020	00	00	00	00	00	00	00	00
0136 7504 JNZ 013C								DS:0028	00	00	00	00	00	00	00	00
0138 85C0 TEST AX,AX								DS:0030	00	00	00	00	00	00	00	00
013A 741C JZ 0158								DS:0038	00	00	00	00	00	00	00	00
013C C746DC0000 MOV [BP-24],0000								DS:0040	00	00	00	00	00	00	00	00
								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	43	3A	5C	00	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	00	00	00	00	00	00	00	00
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	2	ProcStep	3	Retrieve	4	Help ON	5	BRK Menu	6		7	up	8	dn	9
																le
																ri

Iteration 5:

DOSBox 0.74-3, Cpu speed: 3000 cycles, Fram...

AX FFA8 SI 0000 CS 19F5 IP 012D Stack +0 0000

BX 0000 DI 0000 DS 0108 +2 20CD

CX 000B BP 0000 ES 19F5 HS 19F5 +4 9FFF

DX 0007 SP FFFE SS 19F5 FS 19F5 +6 EA00

Flags 7211

OF DF IF SF ZF AF PF CF

0 0 1 0 0 1 0 1

CMD >

0129 D1160501 RCL W/[0105],1

012D FEC9 DEC CL

012F 75E2 JNZ 0113

0131 B8004C MOV AX,4C00

0134 85D2 TEST DX,DX

0136 7504 JNZ 013C

0138 85C0 TEST AX,AX

013A 741C JZ 0158

013C C746DC0000 MOV [BP-24],0000

1

0 1 2 3 4 5 6 7

DS:0000 43 3A 5C 00 00 00 00 00

DS:0008 00 00 00 00 00 00 00 00

DS:0010 00 00 00 00 00 00 00 00

DS:0018 00 00 00 00 00 00 00 00

DS:0020 00 00 00 00 00 00 00 00

DS:0028 00 00 00 00 00 00 00 00

DS:0030 00 00 00 00 00 00 00 00

DS:0038 00 00 00 00 00 00 00 00

DS:0040 00 00 00 00 00 00 00 00

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 43 3A 5C 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

DS:0020 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00

DS:0030 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

C:\.....

1 Step

2 ProcStep

3 Retrieve

4 Help ON

5 BRK Menu

6

7 up

8 dn

9 le

10 ri

Iteration 6:

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

AX 0001 SI 0000 CS 19F5 IP 012D Stack +0 0000

BX 0000 DI 0000 DS 19F5 +2 20CD

CX 000A BP 0000 ES 19F5 HS 19F5 +4 9FFF

DX 0003 SP FFFE SS 19F5 FS 19F5 +6 EA00

Flags 7294

OF DF IF SF ZF AF PF CF

0 0 1 1 0 1 1 0

CMD >

0129 D1160501 RCL W/[0105],1

012D FEC9 DEC CL

012F 75E2 JNZ 0113

0131 B8004C MOV AX,4C00

0134 85D2 TEST DX,DX

0136 7504 JNZ 013C

0138 85C0 TEST AX,AX

013A 741C JZ 0158

013C C746DC0000 MOV [BP-24],0000

1

0 1 2 3 4 5 6 7

DS:0100 E9 0A 00 00 8A 02 00 F4

DS:0108 01 10 4D 02 00 B1 10 8B

DS:0110 16 07 01 D1 EA 73 0E A1

DS:0118 03 01 01 06 09 01 A1 05

DS:0120 01 11 06 0B 01 D1 26 03

DS:0128 01 D1 16 05 01 FE C9 75

DS:0130 E2 B8 00 4C 85 D2 75 04

DS:0138 85 C0 74 1C C7 46 DC 00

DS:0140 00 8E 5E FC 83 7D 0E 00

DS:0148 74 09 8B 46 F2 48 3B 46

Iteration 7:

DOSBox 0.74-3, Cpu speed: 3000 cycles, Frameskip 0, Program: AFD																																																																																																														
AX 0002	SI 0000	CS 19F5	IP 012D	Stack +0 0000	Flags 7214																																																																																																									
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 0001	SP FFFE	SS 19F5	FS 19F5	+6 EA00	0 0 1 0 0 1 1 0																																																																																																									
CMD >				<table><tr><td>1</td><td>0</td><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td><td>7</td></tr><tr><td>DS:0100</td><td>E9</td><td>0A</td><td>00</td><td>00</td><td>14</td><td>05</td><td>00</td><td>F4</td></tr><tr><td>DS:0108</td><td>01</td><td>10</td><td>D7</td><td>04</td><td>00</td><td>B1</td><td>10</td><td>8B</td></tr><tr><td>DS:0110</td><td>16</td><td>07</td><td>01</td><td>D1</td><td>EA</td><td>73</td><td>0E</td><td>A1</td></tr><tr><td>DS:0118</td><td>03</td><td>01</td><td>01</td><td>06</td><td>09</td><td>01</td><td>A1</td><td>05</td></tr><tr><td>DS:0120</td><td>01</td><td>11</td><td>06</td><td>0B</td><td>01</td><td>D1</td><td>26</td><td>03</td></tr><tr><td>DS:0128</td><td>01</td><td>D1</td><td>16</td><td>05</td><td>01</td><td>FE</td><td>C9</td><td>75</td></tr><tr><td>DS:0130</td><td>E2</td><td>B8</td><td>00</td><td>4C</td><td>85</td><td>D2</td><td>75</td><td>04</td></tr><tr><td>DS:0138</td><td>85</td><td>C0</td><td>74</td><td>1C</td><td>C7</td><td>46</td><td>DC</td><td>00</td></tr><tr><td>DS:0140</td><td>00</td><td>8E</td><td>5E</td><td>FC</td><td>83</td><td>7D</td><td>0E</td><td>00</td></tr><tr><td>DS:0148</td><td>74</td><td>09</td><td>8B</td><td>46</td><td>F2</td><td>48</td><td>3B</td><td>46</td></tr></table>								1	0	1	2	3	4	5	6	7	DS:0100	E9	0A	00	00	14	05	00	F4	DS:0108	01	10	D7	04	00	B1	10	8B	DS:0110	16	07	01	D1	EA	73	0E	A1	DS:0118	03	01	01	06	09	01	A1	05	DS:0120	01	11	06	0B	01	D1	26	03	DS:0128	01	D1	16	05	01	FE	C9	75	DS:0130	E2	B8	00	4C	85	D2	75	04	DS:0138	85	C0	74	1C	C7	46	DC	00	DS:0140	00	8E	5E	FC	83	7D	0E	00	DS:0148	74	09	8B	46	F2	48	3B	46
1	0	1	2	3	4	5	6	7																																																																																																						
DS:0100	E9	0A	00	00	14	05	00	F4																																																																																																						
DS:0108	01	10	D7	04	00	B1	10	8B																																																																																																						
DS:0110	16	07	01	D1	EA	73	0E	A1																																																																																																						
DS:0118	03	01	01	06	09	01	A1	05																																																																																																						
DS:0120	01	11	06	0B	01	D1	26	03																																																																																																						
DS:0128	01	D1	16	05	01	FE	C9	75																																																																																																						
DS:0130	E2	B8	00	4C	85	D2	75	04																																																																																																						
DS:0138	85	C0	74	1C	C7	46	DC	00																																																																																																						
DS:0140	00	8E	5E	FC	83	7D	0E	00																																																																																																						
DS:0148	74	09	8B	46	F2	48	3B	46																																																																																																						
0129 D1160501	RCL	W/[0105],1																																																																																																												
012D FEC9	DEC	CL																																																																																																												
012F 75E2	JNZ	0113																																																																																																												
0131 B8004C	MOV	AX,4C00																																																																																																												
0134 85D2	TEST	DX,DX																																																																																																												
0136 7504	JNZ	013C																																																																																																												
0138 85C0	TEST	AX,AX																																																																																																												
013A 741C	JZ	0158																																																																																																												
013C C746DC0000	MOV	[BP-24],0000																																																																																																												

Iteration 8:

DOSBox 0.74-3, Cpu speed: 3000 cycles, Frameskip 0, Program: AFD												-		X																																																																																																						
AX	0005	SI	0000	CS	19F5	IP	012D	Stack	+0 0000	Flags	7214																																																																																																									
BX	0000	DI	0000	DS	19F5				+2 20CD																																																																																																											
CX	0008	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	1	1	0																																																																																																			
CMD >																																																																																																																				
								<table><tr><td>1</td><td>0</td><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td><td>7</td></tr><tr><td>DS:0100</td><td>E9</td><td>0A</td><td>00</td><td>00</td><td>28</td><td>0A</td><td>00</td><td>F4</td></tr><tr><td>DS:0108</td><td>01</td><td>10</td><td>EB</td><td>09</td><td>00</td><td>B1</td><td>10</td><td>8B</td></tr><tr><td>DS:0110</td><td>16</td><td>07</td><td>01</td><td>D1</td><td>EA</td><td>73</td><td>0E</td><td>A1</td></tr><tr><td>DS:0118</td><td>03</td><td>01</td><td>01</td><td>06</td><td>09</td><td>01</td><td>A1</td><td>05</td></tr><tr><td>DS:0120</td><td>01</td><td>11</td><td>06</td><td>0B</td><td>01</td><td>D1</td><td>26</td><td>03</td></tr><tr><td>DS:0128</td><td>01</td><td>D1</td><td>16</td><td>05</td><td>01</td><td>FE</td><td>C9</td><td>75</td></tr><tr><td>DS:0130</td><td>E2</td><td>B8</td><td>00</td><td>4C</td><td>85</td><td>D2</td><td>75</td><td>04</td></tr><tr><td>DS:0138</td><td>85</td><td>C0</td><td>74</td><td>1C</td><td>C7</td><td>46</td><td>DC</td><td>00</td></tr><tr><td>DS:0140</td><td>00</td><td>8E</td><td>5E</td><td>FC</td><td>83</td><td>7D</td><td>0E</td><td>00</td></tr><tr><td>DS:0148</td><td>74</td><td>09</td><td>8B</td><td>46</td><td>F2</td><td>48</td><td>3B</td><td>46</td></tr></table>										1	0	1	2	3	4	5	6	7	DS:0100	E9	0A	00	00	28	0A	00	F4	DS:0108	01	10	EB	09	00	B1	10	8B	DS:0110	16	07	01	D1	EA	73	0E	A1	DS:0118	03	01	01	06	09	01	A1	05	DS:0120	01	11	06	0B	01	D1	26	03	DS:0128	01	D1	16	05	01	FE	C9	75	DS:0130	E2	B8	00	4C	85	D2	75	04	DS:0138	85	C0	74	1C	C7	46	DC	00	DS:0140	00	8E	5E	FC	83	7D	0E	00	DS:0148	74	09	8B	46	F2	48	3B	46
1	0	1	2	3	4	5	6	7																																																																																																												
DS:0100	E9	0A	00	00	28	0A	00	F4																																																																																																												
DS:0108	01	10	EB	09	00	B1	10	8B																																																																																																												
DS:0110	16	07	01	D1	EA	73	0E	A1																																																																																																												
DS:0118	03	01	01	06	09	01	A1	05																																																																																																												
DS:0120	01	11	06	0B	01	D1	26	03																																																																																																												
DS:0128	01	D1	16	05	01	FE	C9	75																																																																																																												
DS:0130	E2	B8	00	4C	85	D2	75	04																																																																																																												
DS:0138	85	C0	74	1C	C7	46	DC	00																																																																																																												
DS:0140	00	8E	5E	FC	83	7D	0E	00																																																																																																												
DS:0148	74	09	8B	46	F2	48	3B	46																																																																																																												
0129	D1160501	RCL	W/[0105],1																																																																																																																	
012D	FEC9	DEC	CL																																																																																																																	
012F	75E2	JNZ	0113																																																																																																																	
0131	B8004C	MOV	AX,4C00																																																																																																																	
0134	85D2	TEST	DX,DX																																																																																																																	
0136	7504	JNZ	013C																																																																																																																	
0138	85C0	TEST	AX,AX																																																																																																																	
013A	741C	JZ	0158																																																																																																																	
013C	C746DC0000	MOV	[BP-24],0000																																																																																																																	

Iteration 9:

DOSBox 0.74-3, Cpu speed: 3000 cycles, Frameskip 0, Program: AFD															
AX 0005	SI 0000	CS 19F5	IP 012D	Stack +0 0000	Flags 7214										
BX 0000	DI 0000	DS 19F5		+2 20CD											
CX 0007	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 1 1 0										
CMD >															
					1	0	1	2	3	4	5	6	7		
0129 D1160501					RCL	W/[0105],1	DS:0100	E9	0A	00	00	50	14	00	F4
012D FEC9					DEC	CL	DS:0108	01	10	EB	09	00	B1	10	8B
012F 75E2					JNZ	0113	DS:0110	16	07	01	D1	EA	73	0E	A1
0131 B8004C					MOV	AX,4C00	DS:0118	03	01	01	06	09	01	A1	05
0134 85D2					TEST	DX,DX	DS:0120	01	11	06	0B	01	D1	26	03
0136 7504					JNZ	013C	DS:0128	01	D1	16	05	01	FE	C9	75
0138 85C0					TEST	AX,AX	DS:0130	E2	B8	00	4C	85	D2	75	04
013A 741C					JZ	0158	DS:0138	85	C0	74	1C	C7	46	DC	00
013C C746DC0000					MOV	[BP-24],0000	DS:0140	00	8E	5E	FC	83	7D	0E	00
							DS:0148	74	09	8B	46	F2	48	3B	46

Iteration 10:

AX 0005	SI 0000	CS 19F5	IP 012D	Stack +0 0000	Flags 7294																																																																																																																																																									
BX 0000	DI 0000	DS 19F5		+2 20CD																																																																																																																																																										
CX 0006	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 1 0																																																																																																																																																									
CMD >				<table><tr><td>1</td><td>0</td><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td><td>7</td><td colspan="4"></td></tr><tr><td>DS:0100</td><td>E9</td><td>0A</td><td>00</td><td>00</td><td>A0</td><td>28</td><td>00</td><td>F4</td><td colspan="4"></td></tr><tr><td>DS:0108</td><td>01</td><td>10</td><td>EB</td><td>09</td><td>00</td><td>B1</td><td>10</td><td>8B</td><td colspan="4"></td></tr><tr><td>DS:0110</td><td>16</td><td>07</td><td>01</td><td>D1</td><td>EA</td><td>73</td><td>0E</td><td>A1</td><td colspan="4"></td></tr><tr><td>DS:0118</td><td>03</td><td>01</td><td>01</td><td>06</td><td>09</td><td>01</td><td>A1</td><td>05</td><td colspan="4"></td></tr><tr><td>DS:0120</td><td>01</td><td>11</td><td>06</td><td>0B</td><td>01</td><td>D1</td><td>26</td><td>03</td><td colspan="4"></td></tr><tr><td>DS:0128</td><td>01</td><td>D1</td><td>16</td><td>05</td><td>01</td><td>FE</td><td>C9</td><td>75</td><td colspan="4"></td></tr><tr><td>DS:0130</td><td>E2</td><td>B8</td><td>00</td><td>4C</td><td>85</td><td>D2</td><td>75</td><td>04</td><td colspan="4"></td></tr><tr><td>DS:0138</td><td>85</td><td>C0</td><td>74</td><td>1C</td><td>C7</td><td>46</td><td>DC</td><td>00</td><td colspan="4"></td></tr><tr><td>DS:0140</td><td>00</td><td>8E</td><td>5E</td><td>FC</td><td>83</td><td>7D</td><td>0E</td><td>00</td><td colspan="4"></td></tr><tr><td>DS:0148</td><td>74</td><td>09</td><td>8B</td><td>46</td><td>F2</td><td>48</td><td>3B</td><td>46</td><td colspan="4"></td></tr></table>												1	0	1	2	3	4	5	6	7					DS:0100	E9	0A	00	00	A0	28	00	F4					DS:0108	01	10	EB	09	00	B1	10	8B					DS:0110	16	07	01	D1	EA	73	0E	A1					DS:0118	03	01	01	06	09	01	A1	05					DS:0120	01	11	06	0B	01	D1	26	03					DS:0128	01	D1	16	05	01	FE	C9	75					DS:0130	E2	B8	00	4C	85	D2	75	04					DS:0138	85	C0	74	1C	C7	46	DC	00					DS:0140	00	8E	5E	FC	83	7D	0E	00					DS:0148	74	09	8B	46	F2	48	3B	46				
1	0	1	2	3	4	5	6	7																																																																																																																																																						
DS:0100	E9	0A	00	00	A0	28	00	F4																																																																																																																																																						
DS:0108	01	10	EB	09	00	B1	10	8B																																																																																																																																																						
DS:0110	16	07	01	D1	EA	73	0E	A1																																																																																																																																																						
DS:0118	03	01	01	06	09	01	A1	05																																																																																																																																																						
DS:0120	01	11	06	0B	01	D1	26	03																																																																																																																																																						
DS:0128	01	D1	16	05	01	FE	C9	75																																																																																																																																																						
DS:0130	E2	B8	00	4C	85	D2	75	04																																																																																																																																																						
DS:0138	85	C0	74	1C	C7	46	DC	00																																																																																																																																																						
DS:0140	00	8E	5E	FC	83	7D	0E	00																																																																																																																																																						
DS:0148	74	09	8B	46	F2	48	3B	46																																																																																																																																																						
0129 D1160501	RCL	W/[0105],1																																																																																																																																																												
012D FEC9	DEC	CL																																																																																																																																																												
012F 75E2	JNZ	0113																																																																																																																																																												
0131 B8004C	MOV	AX,4C00																																																																																																																																																												
0134 85D2	TEST	DX,DX																																																																																																																																																												
0136 7504	JNZ	013C																																																																																																																																																												
0138 85C0	TEST	AX,AX																																																																																																																																																												
013A 741C	JZ	0158																																																																																																																																																												
013C C746DC0000	MOV	[BP-24],0000																																																																																																																																																												

Iteration 11:

AX 0005	SI 0000	CS 19F5	IP 012D	Stack +0 0000	Flags 7214
BX 0000	DI 0000	DS 19F5		+2 20CD	
CX 0005	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 1 1 0
CMD >				1	0 1 2 3 4 5 6 7
0129 D1160501	RCL	W/[0105],1		DS:0100	E9 0A 00 00 40 51 00 F4
012D FEC9	DEC	CL		DS:0108	01 10 EB 09 00 B1 10 8B
012F 75E2	JNZ	0113		DS:0110	16 07 01 D1 EA 73 0E A1
0131 B8004C	MOV	AX,4C00		DS:0118	03 01 01 06 09 01 A1 05
0134 85D2	TEST	DX,DX		DS:0120	01 11 06 0B 01 D1 26 03
0136 7504	JNZ	013C		DS:0128	01 D1 16 05 01 FE C9 75
0138 85C0	TEST	AX,AX		DS:0130	E2 B8 00 4C 85 D2 75 04
013A 741C	JZ	0158		DS:0138	85 C0 74 1C C7 46 DC 00
013C C746DC0000	MOV	[BP-24],0000		DS:0140	00 8E 5E FC 83 7D 0E 00
				DS:0148	74 09 8B 46 F2 48 3B 46

Iteration 12:

AX 0005	SI 0000	CS 19F5	IP 012D	Stack +0 0000	Flags 7294
BX 0000	DI 0000	DS 19F5		+2 20CD	
CX 0004	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 1 0
CMD >				1	0 1 2 3 4 5 6 7
0129 D1160501	RCL	W/[0105],1		DS:0100	E9 0A 00 00 80 A2 00 F4
012D FEC9	DEC	CL		DS:0108	01 10 EB 09 00 B1 10 8B
012F 75E2	JNZ	0113		DS:0110	16 07 01 D1 EA 73 0E A1
0131 B8004C	MOV	AX,4C00		DS:0118	03 01 01 06 09 01 A1 05
0134 85D2	TEST	DX,DX		DS:0120	01 11 06 0B 01 D1 26 03
0136 7504	JNZ	013C		DS:0128	01 D1 16 05 01 FE C9 75
0138 85C0	TEST	AX,AX		DS:0130	E2 B8 00 4C 85 D2 75 04
013A 741C	JZ	0158		DS:0138	85 C0 74 1C C7 46 DC 00
013C C746DC0000	MOV	[BP-24],0000		DS:0140	00 8E 5E FC 83 7D 0E 00
				DS:0148	74 09 8B 46 F2 48 3B 46

Iteration 13:

DOSBox 0.74-3, Cpu speed: 3000 cycles, Frameskip 0, Program: AFD												—	×				
AX	0005	SI	0000	CS	19F5	IP	012D	Stack	+0 0000	Flags	7254						
BX	0000	DI	0000	DS	19F5				+2 20CD								
CX	0003	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	1	1	1	0
CMD >																	
1 0 1 2 3 4 5 6 7																	
0129	D1160501		RCL		W/[0105],1			DS:0100	E9	0A	00	00	00	45	01	F4	
012D	FEC9		DEC		CL			DS:0108	01	10	EB	09	00	B1	10	8B	
012F	75E2		JNZ		0113			DS:0110	16	07	01	D1	EA	73	0E	A1	
0131	B8004C		MOV		AX,4C00			DS:0118	03	01	01	06	09	01	A1	05	
0134	85D2		TEST		DX,DX			DS:0120	01	11	06	0B	01	D1	26	03	
0136	7504		JNZ		013C			DS:0128	01	D1	16	05	01	FE	C9	75	
0138	85C0		TEST		AX,AX			DS:0130	E2	B8	00	4C	85	D2	75	04	
013A	741C		JZ		0158			DS:0138	85	C0	74	1C	C7	46	DC	00	
013C	C746DC0000		MOV		[BP-24],0000			DS:0140	00	8E	5E	FC	83	7D	0E	00	
								DS:0148	74	09	8B	46	F2	48	3B	46	

Iteration 14:

AX 0005	SI 0000	CS 19F5	IP 012D	Stack +0 0000	Flags 7254								
BX 0000	DI 0000	DS 19F5		+2 20CD									
CX 0002	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 1 1 1 0								
CMD >													
				1	0	1	2	3	4	5	6	7	
				DS:0100	E9	0A	00	00	00	8A	02	F4	
				DS:0108	01	10	EB	09	00	B1	10	8B	
				DS:0110	16	07	01	D1	EA	73	0E	A1	
				DS:0118	03	01	01	06	09	01	A1	05	
				DS:0120	01	11	06	0B	01	D1	26	03	
				DS:0128	01	D1	16	05	01	FE	C9	75	
				DS:0130	E2	B8	00	4C	85	D2	75	04	
				DS:0138	85	C0	74	1C	C7	46	DC	00	
				DS:0140	00	8E	5E	FC	83	7D	0E	00	
				DS:0148	74	09	8B	46	F2	48	3B	46	
0129	D1160501	RCL	W/[0105],1										
012D	FEC9	DEC	CL										
012F	75E2	JNZ	0113										
0131	B8004C	MOV	AX,4C00										
0134	85D2	TEST	DX,DX										
0136	7504	JNZ	013C										
0138	85C0	TEST	AX,AX										
013A	741C	JZ	0158										
013C	C746DC0000	MOV	[BP-24],0000										

Iteration 15:

DOSBox 0.74-3, Cpu speed: 3000 cycles, Frameskip 0, Program: AFD														-	×
AX 0005	SI 0000	CS 19F5	IP 012D	Stack +0	0000	Flags 7254									
BX 0000	DI 0000	DS 19F5		+2	20CD										
CX 0001	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 1 1 0									
CMD >							1	0	1	2	3	4	5	6	7
0129 D1160501	RCL	W/[0105],1		DS:0100	E9	0A	00	00	00	14	05	F4			
012D FEC9	DEC	CL		DS:0108	01	10	EB	09	00	B1	10	8B			
012F 75E2	JNZ	0113		DS:0110	16	07	01	D1	EA	73	0E	A1			
0131 B8004C	MOV	AX,4C00		DS:0118	03	01	01	06	09	01	A1	05			
0134 85D2	TEST	DX,DX		DS:0120	01	11	06	0B	01	D1	26	03			
0136 7504	JNZ	013C		DS:0128	01	D1	16	05	01	FE	C9	75			
0138 85C0	TEST	AX,AX		DS:0130	E2	B8	00	4C	85	D2	75	04			
013A 741C	JZ	0158		DS:0138	85	C0	74	1C	C7	46	DC	00			
013C C746DC0000	MOV	[BP-24],0000		DS:0140	00	8E	5E	FC	83	7D	0E	00			
				DS:0148	74	09	8B	46	F2	48	3B	46			