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Micro : LAB1

Problem 1 :

➤ Start AX=1

Loop using counter register (CX) from 5 to 0 step=-1

Every iteration $AX = AX * CX$

```
DOSBox 0.74-3, Cpu speed: 3000 cycles, Frameskip 0, Progra...
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=0103 NU UP EI PL NZ NA PO NC
073F:0103 8B0E0003 MOV CX,10300] DS:0300=0005
-T
AX=0001 BX=0000 CX=0005 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 PO NC
073F:0107 F7E1 MJL CX
-T
AX=0005 BX=0000 CX=0005 DX=0000 SP=00FD BP=0000 SI=0000 DI=0000
DS=073F ES=073F SS=073F CS=073F IP=0109 NU UP EI PL NZ NA PO NC
073F:0109 E2FC LOOP 0107
-T
AX=0005 BX=0000 CX=0004 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 PO NC
073F:0107 F7E1 MJL CX
-T
AX=0014 BX=0000 CX=0004 DX=0000 SP=00FD BP=0000 SI=0000 DI=0000
DS=073F ES=073F SS=073F CS=073F IP=0109 NU UP EI PL NZ NA PO NC
073F:0109 E2FC LOOP 0107
```

In the start ax=1

Put cx=content of 300 =5

Put ax= $ax * cx = 1 * 5 = 5$

$ax = 5 * 4 = 14 H$

$ax = 14 * 3 = 3C H$

$ax = 3C * 2 = 78 H$

$ax = 78 * 1 = 78 H$

```
DOSBox 0.74-3, Cpu speed: 3000 cycles, Frameskip 0, Progra...
AX=003C BX=0000 CX=0002 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 PO NC
073F:0107 F7E1 MJL CX
-T
AX=0078 BX=0000 CX=0002 DX=0000 SP=00FD BP=0000 SI=0000 DI=0000
DS=073F ES=073F SS=073F CS=073F IP=0109 NU UP EI PL NZ NA PO NC
073F:0109 E2FC LOOP 0107
-T
AX=0078 BX=0000 CX=0001 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 PO NC
073F:0107 F7E1 MJL CX
-T
AX=0078 BX=0000 CX=0001 DX=0000 SP=00FD BP=0000 SI=0000 DI=0000
DS=073F ES=073F SS=073F CS=073F IP=0109 NU UP EI PL NZ NA PO NC
073F:0109 E2FC LOOP 0107
-T
AX=0078 BX=0000 CX=0000 DX=0000 SP=00FD BP=0000 SI=0000 DI=0000
DS=073F ES=073F SS=073F CS=073F IP=010B NU UP EI PL NZ NA PO NC
073F:010B CC INT 3
```

Problem 2 :

This code @ g=200 gets the sum of all odd numbers <=10

@ g=300 gets the sum of all even numbers <=10

- G =200 200 :

```
DOSBox 0.74-3, Cpu speed: 3000 cycles, Frameskip 0, Progra...
073F:0113
-A 200
073F:0200 MOV CX,1
073F:0203 JMP 100
073F:0206
-A 300
073F:0300 MOV CX,0
073F:0303 JMP 100
073F:0306
-G =200 200

AX=0000 BX=0000 CX=0000 DX=0000 SP=00FD BP=0000 SI=0000 DI=0000
DS=073F ES=073F SS=073F CS=073F IP=0200  NU UP EI PL NZ NA PO NC
073F:0200 B90100      MOV     CX,0001
-T

AX=0000 BX=0000 CX=0001 DX=0000 SP=00FD BP=0000 SI=0000 DI=0000
DS=073F ES=073F SS=073F CS=073F IP=0203  NU UP EI PL NZ NA PO NC
073F:0203 E9FAFE      JMP     0100
-T

AX=0000 BX=0000 CX=0001 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 B80000      MOV     AX,0000
-
```

Ip =200

CX =1

Then jump to the main code

ip=100

AX=0

BX=A

AX=AX+CX=1

```
DOSBox 0.74-3, Cpu speed: 3000 cycles, Frameskip 0, Progra...
AX=0000 BX=0000 CX=0001 DX=0000 SP=00FD BP=0000 SI=0000 DI=0000
DS=073F ES=073F SS=073F CS=073F IP=0103  NU UP EI PL NZ NA PO NC
073F:0103 8B1E0004      MOV     BX,[0400]
DS:0400=000A
-T

AX=0000 BX=000A CX=0001 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 PO NC
073F:0107 39D9      CMP     CX,BX
-T

AX=0000 BX=000A CX=0001 DX=0000 SP=00FD BP=0000 SI=0000 DI=0000
DS=073F ES=073F SS=073F CS=073F IP=0109  NU UP EI NG NZ AC PO CY
073F:0109 7707      JA      0112
-T

AX=0000 BX=000A CX=0001 DX=0000 SP=00FD BP=0000 SI=0000 DI=0000
DS=073F ES=073F SS=073F CS=073F IP=010B  NU UP EI NG NZ AC PO CY
073F:010B 01C8      ADD     AX,CX
-T

AX=0001 BX=000A CX=0001 DX=0000 SP=00FD BP=0000 SI=0000 DI=0000
DS=073F ES=073F SS=073F CS=073F IP=010D  NU UP EI PL NZ NA PO NC
073F:010D 83C102      ADD     CX,+02
-
```

```

DOSBox 0.74-3, Cpu speed: 3000 cycles, Frameskip 0, Progra...
AX=0001 BX=000A CX=0003 DX=0000 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 EBF5 JMP 0107
-T
AX=0001 BX=000A CX=0003 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 39D9 CMP CX,BX
-T
AX=0001 BX=000A CX=0003 DX=0000 SP=00FD BP=0000 SI=0000 DI=0000
DS=073F ES=073F SS=073F CS=073F IP=0109 NU UP EI NG NZ AC PE CY
073F:0109 7707 JA 0112
-T
AX=0001 BX=000A CX=0003 DX=0000 SP=00FD BP=0000 SI=0000 DI=0000
DS=073F ES=073F SS=073F CS=073F IP=010B NU UP EI NG NZ AC PE CY
073F:010B 01C8 ADD AX,CX
-T
AX=0004 BX=000A CX=0003 DX=0000 SP=00FD BP=0000 SI=0000 DI=0000
DS=073F ES=073F SS=073F CS=073F IP=010D NU UP EI PL NZ NA PD NC
073F:010D 83C102 ADD CX,+02
-

```

CX=3 H

AX=1+3=4 H

CX=5 H

AX=4+5=9 H

CX=7 H

AX=9+7=10 H

CX=9 H

AX=10+9=19 H

CX=B H > 10 stop

```

DOSBox 0.74-3, Cpu speed: 3000 cycles, Frameskip 0, Progra...
AX=0019 BX=000A CX=0009 DX=0000 SP=00FD BP=0000 SI=0000 DI=0000
DS=073F ES=073F SS=073F CS=073F IP=010D NU UP EI PL NZ NA PD NC
073F:010D 83C102 ADD CX,+02
-T
AX=0019 BX=000A CX=000B DX=0000 SP=00FD BP=0000 SI=0000 DI=0000
DS=073F ES=073F SS=073F CS=073F IP=0110 NU UP EI PL NZ NA PD NC
073F:0110 EBF5 JMP 0107
-T
AX=0019 BX=000A CX=000B 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 PD NC
073F:0107 39D9 CMP CX,BX
-T
AX=0019 BX=000A CX=000B DX=0000 SP=00FD BP=0000 SI=0000 DI=0000
DS=073F ES=073F SS=073F CS=073F IP=0109 NU UP EI PL NZ NA PD NC
073F:0109 7707 JA 0112
-T
AX=0019 BX=000A CX=000B DX=0000 SP=00FD BP=0000 SI=0000 DI=0000
DS=073F ES=073F SS=073F CS=073F IP=0112 NU UP EI PL NZ NA PD NC
073F:0112 CC INT 3
-

```

- G =300 300

```
DOSBox 0.74-3, Cpu speed: 3000 cycles, Frameskip 0, Progra...
-A 300
073F:0300 MOV CX,0
073F:0303 JMP 100
073F:0306
-G =300 300

AX=0000 BX=0000 CX=0000 DX=0000 SP=00FD BP=0000 SI=0000 DI=0000
DS=073F ES=073F SS=073F CS=073F IP=0300  NU UP EI PL NZ NA PO NC
073F:0300 B90000      MOV     CX,0000
-T

AX=0000 BX=0000 CX=0000 DX=0000 SP=00FD BP=0000 SI=0000 DI=0000
DS=073F ES=073F SS=073F CS=073F IP=0303  NU UP EI PL NZ NA PO NC
073F:0303 E9F0FD      JMP     0100
-T

AX=0000 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 B80000      MOV     AX,0000
-T

AX=0000 BX=0000 CX=0000 DX=0000 SP=00FD BP=0000 SI=0000 DI=0000
DS=073F ES=073F SS=073F CS=073F IP=0103  NU UP EI PL NZ NA PO NC
073F:0103 8B1E0004     MOV     BX,[0400]      DS:0400=000A
-
```

Ip =300

CX =0

Then jump to the
main code

ip=100

AX=0

BX=A

AX=AX+CX=0

```
DOSBox 0.74-3, Cpu speed: 3000 cycles, Frameskip 0, Progra...
AX=0000 BX=000A 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 PO NC
073F:0107 39D9      CMP     CX,BX
-T

AX=0000 BX=000A CX=0000 DX=0000 SP=00FD BP=0000 SI=0000 DI=0000
DS=073F ES=073F SS=073F CS=073F IP=0109  NU UP EI NG NZ AC PE CY
073F:0109 7707      JA      0112
-T

AX=0000 BX=000A CX=0000 DX=0000 SP=00FD BP=0000 SI=0000 DI=0000
DS=073F ES=073F SS=073F CS=073F IP=010B  NU UP EI NG NZ AC PE CY
073F:010B 01C8      ADD     AX,CX
-T

AX=0000 BX=000A CX=0000 DX=0000 SP=00FD BP=0000 SI=0000 DI=0000
DS=073F ES=073F SS=073F CS=073F IP=010D  NU UP EI PL ZR NA PE NC
073F:010D 83C102     ADD     CX,+02
-T

AX=0000 BX=000A CX=0002 DX=0000 SP=00FD BP=0000 SI=0000 DI=0000
DS=073F ES=073F SS=073F CS=073F IP=0110  NU UP EI PL NZ NA PO NC
073F:0110 EBF5      JMP     0107
-
```

```

DOSBox 0.74-3, Cpu speed: 3000 cycles, Frameskip 0, Progra...
AX=0000 BX=0000 CX=0002 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 PO NC
073F:0107 39D9 CMP CX,BX
-T
AX=0000 BX=0000 CX=0002 DX=0000 SP=00FD BP=0000 SI=0000 DI=0000
DS=073F ES=073F SS=073F CS=073F IP=0109 NU UP EI NG NZ AC PO CY
073F:0109 7707 JA 0112
-T
AX=0000 BX=0000 CX=0002 DX=0000 SP=00FD BP=0000 SI=0000 DI=0000
DS=073F ES=073F SS=073F CS=073F IP=010B NU UP EI NG NZ AC PO CY
073F:010B 01C8 ADD AX,CX
-T
AX=0002 BX=0000 CX=0002 DX=0000 SP=00FD BP=0000 SI=0000 DI=0000
DS=073F ES=073F SS=073F CS=073F IP=010D NU UP EI PL NZ NA PO NC
073F:010D 83C102 ADD CX,+02
-T
AX=0002 BX=0000 CX=0004 DX=0000 SP=00FD BP=0000 SI=0000 DI=0000
DS=073F ES=073F SS=073F CS=073F IP=0110 NU UP EI PL NZ NA PO NC
073F:0110 EBF5 JMP 0107

```

CX=2 H

AX=0+2= 2 H

CX=4 H

AX=2+4=6 H

CX=6 H

AX=6+6=C H

CX=8 H

AX=C+8=14 H

CX= AH

AX=14+A=1E H

CX=C H > 10 stop

```

DOSBox 0.74-3, Cpu speed: 3000 cycles, Frameskip 0, Progra...
AX=0014 BX=0000 CX=000A DX=0000 SP=00FD BP=0000 SI=0000 DI=0000
DS=073F ES=073F SS=073F CS=073F IP=010B NU UP EI PL ZR NA PE NC
073F:010B 01C8 ADD AX,CX
-T
AX=001E BX=0000 CX=000A DX=0000 SP=00FD BP=0000 SI=0000 DI=0000
DS=073F ES=073F SS=073F CS=073F IP=010D NU UP EI PL NZ NA PE NC
073F:010D 83C102 ADD CX,+02
-T
AX=001E BX=0000 CX=000C DX=0000 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 EBF5 JMP 0107
-T
AX=001E BX=0000 CX=000C 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 39D9 CMP CX,BX
-T
AX=001E BX=0000 CX=000C DX=0000 SP=00FD BP=0000 SI=0000 DI=0000
DS=073F ES=073F SS=073F CS=073F IP=0109 NU UP EI PL NZ NA PO NC
073F:0109 7707 JA 0112
-T

```

```

DOSBox 0.74-3, Cpu speed: 3000 cycles, Frameskip 0, Progra...
AX=001E BX=0000 CX=000C DX=0000 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 EBF5 JMP 0107
-T
AX=001E BX=0000 CX=000C 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 39D9 CMP CX,BX
-T
AX=001E BX=0000 CX=000C DX=0000 SP=00FD BP=0000 SI=0000 DI=0000
DS=073F ES=073F SS=073F CS=073F IP=0109 NU UP EI PL NZ NA PO NC
073F:0109 7707 JA 0112
-T
AX=001E BX=0000 CX=000C DX=0000 SP=00FD BP=0000 SI=0000 DI=0000
DS=073F ES=073F SS=073F CS=073F IP=0112 NU UP EI PL NZ NA PO NC
073F:0112 CC INT 3
-T
AX=001E BX=0000 CX=000C DX=0000 SP=00F7 BP=0000 SI=0000 DI=0000
DS=073F ES=073F SS=073F CS=01A3 IP=13B1 NU UP DI PL NZ NA PO NC
01A3:13B1 55 PUSH BP

```