

MUL-DIV

Program A	Program B	Program C	Program D	Program E		
Mov BL,250 Mov AL,244 Imul BL Mov DH,AH Mov AH,2 Mov DL,AL Int 21h Mov DL,DH Int 21h Mov AH,76 Int 21h	Mov AX,5497 Mov BL,100 Div BL Mov DL,AL Mov DH,AH Mov AH,2 Int 21h Mov DL,DH Int 21h Int 21h Stop	Mov AX,2000 Mov BX,150 Mul BX Mov CX,AX Mov AH,2 Int 21h Mov DL,CH Int 21h Mov DL,CL Int 21h Stop	Mov DX,40 Mov AX,4000 Mov BX,10000 Div BX Mov CX,AX XCHG DH,DL Mov AH,2 Int 21h Print DH,CH,CL	Mov AH,1 Int 21h Mov BL,2 Mul BL Mov DL,AL Mov AH,2 Int 21h Mov AH,76 Int 21h End		

Program A: BL=6 AL=12 BL*AL AX=6*12=72(H)

BL=250=-6 AL=244=-12 IMUL BL does AX=AL*BL=(-6)(-12)=72=0*256+72 AH=0 AL=72.

Replace IMUL by MUL AX=250*244=61000 AH=238 AL=72 206*6=1236=4,212 or -300=254,212

Program B: Div BL performs AL=AX div BL=54 AH=AX mod BL=97 Hence output is 6a.

BL: 156 o/p 35,37(#%) 5497 div 156=35 5497 mod 156=37

Idiv BL: BL=156=-100 5497=(-54)*(-100)+97. Output 202,97 Since -54=202

AX=60139=-5397 BL:100 -5397=(-53)*100-97 o/p 203,159 BL:156 -5397=(53)*(-100)-97 o/p 53,159

Program C: Mul BX is AX*BX stored in DX:AX 2000*150=3,00,000

DX=3,00,000 div 65536=4 AX=3,00,000 mod 65536=37856 Now AH=147 AL=224

Program D: Div BX is AX=DX:AX div BX DX=mod DX=40 AX=4000 DX:AX=65536*40+4000
= 2625440 div-mod10000 AX=262 DX=5440 AH=1 AL=6 DH=21 DL=64

Program E: Read a letter output a letter with double ascii code. 2 → d # → F

AL	BL	Mul BL (Unsigned)	IMul BL Signed multiplication
156	200	AX=31200	AX=5600 because 156 is -100. 200 is -56. (-100)(-56)=+5600
156	100	AX=15600	AX=55536 because 156 is -100. 100 is +100. (-100)(+100)=-10000 it is (-10000+65536=55536)
AX	BL	Div BL (Unsigned)	IDiv BL Signed division
12035	100	AL=120 AH=35	AL=120 AH=35 because 12035=(+100)(+120)+35
12035	156	AL=77 AH=23 12035=77*156+23	AL=136 AH=35 because 12035=(-100)(-120)+35 0..32765 are positive and 32768..65535 are negative.
53501	100	divide overflow 535 unrepresentable	AL=136 AH=221 because -12035=(+100)(-120)-35 -120 is 256-120=136 -35 is 256-35=221
53501	156	divide overflow	AL=120 AH=221 because -12035=(-100)(+120)-35

1. Read two digits. Find product. Input 98 output H. Input 76 output * Input 99 output Q
2. Read two letters. Find (product of ascii) divmod 100. Input FQ output 8F 70*81=5670 EG → 0c
3. Read a letter. Print last digit of ascii code. H → 2 b → 8. Second last digit. G → 7 g → 0 z → 2
4. Read a letter Find (7*ascii) div 5. 2 → F (50*7=350) G → c
5. (ascii-80)*13+75 S → r N → 1 (ascii-80)*(-13)+75 S → \$ N → e
6. [1000 divmod (ascii-80)]+75 7 → #K p → jS 2 → *U (-1000 divmod..) 7 → sK n → *A
7. [{122*(ascii-80)} div 500]+75 (byte mul) i → Q 7 → E (Hard)
8. [{162*(ascii-80)} div 500]+75 i → S 7 → C
9. [{1000 div (ascii-80)} mod 50]+75 Y → V G → @ (unsign AX=AL is AH=0 sign AX=AL is CBW)
10. [(ascii80) divmod 6]+75 (CBW:AX=AL) d → NM 3 → GF [(ascii80) divmod -6]+75 d → HM 3 → OF

11. $[100000 \bmod (x-80)]+75$ n → U 2 → U B → W (use CBW) $[-100000\dots]$ n → A d → K B → ?
12. $[100000 \bmod \{100*(x-80)\}]+75$ 2 → * x → d $[-100000 \bmod \dots]$ n → * x → 2
13. $[\{(ascii-80)*256\} \bmod 100]+75$ L → A3 E → /; T → Uc (no mul) $\bmod -100$ L → U3 E → g; T → Ac
14. $[\{100*(ascii-80)\} \bmod 256]+75$ (no div) Z → N3 F → Gc(not H) (using div) Z → N3 F → Hc
15. $[100000 \bmod \{256*(ascii-80)\}]+75$ (no mul) d → ^ 7 → < s → V A → 1₍₄₉₎ -100000 d → 8 7 → Z s → @ A → e
 $[\{65536*(ascii-80)\} \bmod 10000]+75$ (no mul) L → 1₍₄₉₎ T → e