

The screenshot shows a VMware Player window titled "ECE 4270 MSI W98SE - VMware Player (Non-commercial use only)". Inside the player is an "MS-DOS Prompt - TD" window. The window has a menu bar with "Auto" and a toolbar with various icons. The main text area shows the following output:

```

Passes: 1
Remaining memory: 382k

Turbo Link Version 7.1.30.1. Copyright (c) 1987, 1996 Borland International

    Available memory 4092920

C:\lab6>td matrix
Turbo Debugger Version 5.0 Copyright (c) 1988,96 Borland International

Enter the first 3 dimensional vector below

enter x component: 1
enter y component: 2
enter z component: 3
Enter the second 3 dimensional vector below

enter x component: 4
enter y component: 5
enter z component: 6

```

At the bottom of the window, there is a status bar with the following information:

- Ln 23, Col 47
- Insert
- Sel: Normal
- UNIX
- File size: 531

The taskbar at the very bottom of the screen shows the Start button, several application icons, and the system clock displaying "11:58 PM".



Player ▾



MS-DOS Prompt - TD



File Edit View Run Breakpoints Data Options Window Help

```
CS:0418 CC int 03
#MMATH#26: PUSH BP
CS:0419 55 push bp
#MMATH#27: MOV BP,SP
CS:041A 8BEC mov bp,sp
#MMATH#28: ADD BP, 8
CS:041C 83C508 add bp,0008
#MMATH#29: MOV BP, [BP]
CS:041F 8B6E00 mov bp,[bp]
#MMATH#30: MOV DWORD PTR[BP], 8
CS:0422 66C74600080000+mov dword ptr [bp],00000008
#MMATH#31: MOV DWORD PTR[BP+4], 9
CS:042A 66C74604090000+mov dword ptr [bp+04],00000009
#MMATH#32: MOV DWORD PTR[BP+8], 10
CS:0432 66C746080A0000+mov dword ptr [bp+08],0000000A
#MMATH#33: POP BP
CS:043A 5D pop bp
#MMATH#34: RET
CS:043B C3 ret
_atexit
CS:043C 55 push bp
CS:043D 8BEC mov bp,sp
CS:043F 833EA80120 cmp word ptr [__atexitcnt],0020
CS:0444 7505 jne 044B
CS:0446 B80100 mov ax,0001
CS:0449 EB13 jmp 045E
CS:044B 8B1EA801 mov bx,[__atexitcnt]
CS:044F D1E3 shl bx,1
CS:0451 8B4604 mov ax,[bp+04]
CS:0454 8987B005 mov [bx+05B0],ax
CS:0458 FF06A801 inc word ptr [__atexitcnt]
CS:045C 33C0 xor ax,ax
CS:045E 5D pop bp
```

```
13FB:0000 CD 20 D6 9E 00 9A F0 FE = 0x00000000
13FB:0008 1D F0 32 0B 5A 11 0F 07 = 0x00000000
13FB:0010 00 0F 78 01 12 0D E3 0E = 0x00000000
13FB:0018 01 01 01 00 02 08 FF FF = 0x00000000
13FB:0020 FF FF FF FF FF FF FF FF = 0x00000000
13FB:0028 FF FF FF FF EA 13 20 FF = 0x00000000
13FB:0030 00 16 14 00 18 00 FB 13 = 0x00000000
13FB:0038 FF FF FF FF 00 00 00 00 = 0x00000000
13FB:0040 07 0A 00 00 00 00 00 00 = 0x00000000
13FB:0048 00 00 00 00 00 00 00 00 = 0x00000000
13FB:0050 CD 21 CB 00 00 00 00 00 = 0x00000000
```

```
ax FFF0
bx 0001
cx FFEA
dx 0000
si 05AA
di 05B0
bp FFF6
sp FFD0
ds 1600
es 1600
fs 1600
gs 140B
ip 0418
```

```
SS:000A 2064
SS:0008 6E61
SS:0006 6C72
SS:0004 6F42
SS:0002 0000
SS:0000 0000
SS:FFFE 0000
SS:FFFC 0000
SS:FFFA 0000
SS:FFF8 0158
SS:FFF6 0000
SS:FFF4 0003
SS:FFF2 0002
SS:FFE0 0001
SS:FFEE 0006
SS:FFEC 0005
SS:FFEA 0004
SS:FFE8 00C9
SS:FFE6 106C
SS:FFE4 1600
SS:FFE2 FFF4
SS:FFE0 05B0
SS:FFDE 05AA
SS:FFDC 80D3
SS:FFDA 0200
SS:FFD8 0001
SS:FFD6 FFD8
SS:FFD4 FFEA
SS:FFD2 FFF0
SS:FFD0 02C0
```

F9 Run to Breakpoint

Address of result
Address of vector b
Address of vector a

F1-Help F2-Bkpt F3-Mod F4-Here F5-Zoom F6-Next F7-Trace F8-Step F9-Run F10-Menu

Ln 23, Col 47

Insert

Sel: Normal

UNIX

File size: 531



Exploring - C:\lab6

ConTEXT

MS-DOS Prompt - TD



12:00 AM

```
MS-DOS Prompt - TD
Auto
File Edit View Run Breakpoints Data Options Window Help
[ ]=CPU Pentium Pro
_crossP: INT 03H
cs:0418 CC int 03
#MMATH#26: PUSH BP
cs:0419 55 push bp
#MMATH#27: MOV BP,SP
cs:041A 8BEC mov bp,sp
#MMATH#28: ADD BP, 8
cs:041C 83C508 add bp,0008
#MMATH#29: MOV BP, [BP]
cs:041F 8B6E00 mov bp,[bp]
#MMATH#30: MOV DWORD PTR[BP], 8
cs:0422 66C74600080000+mov dword ptr [bp],00000008
#MMATH#31: MOV DWORD PTR[BP+4], 9
cs:042A 66C74604090000+mov dword ptr [bp+04],00000009
#MMATH#32: MOV DWORD PTR[BP+8], 10
cs:0432 66C746080A0000+mov dword ptr [bp+08],0000000A
#MMATH#33: POP BP
cs:043A 5D pop bp
#MMATH#34: RET
cs:043B C3 ret
_atexit
cs:043C 55 push bp
cs:043D 8BEC mov bp,sp
cs:043F 833EA80120 cmp word ptr [__atexitcnt],0020
cs:0444 7505 jne 044B
cs:0446 B80100 mov ax,0001
cs:0449 EB13 jmp 045E
cs:044B 8B1EA801 mov bx,[__atexitcnt]
cs:044F 01E3 shl bx,1
cs:0451 8B4604 mov ax,[bp+04]
cs:0454 8987B005 mov [bx+05B0],ax
cs:0458 FF06A801 inc word ptr [__atexitcnt]
cs:045C 33C0 xor ax,ax
cs:045E 5D pop bp
13FB:0000 CD 20 D6 9E 00 9A F0 FE = 0x00000000
13FB:0008 1D F0 32 0B 5A 11 0F 07 += 0x00000000
13FB:0010 00 0F 78 01 12 0D E3 0E 0x00000000
13FB:0018 01 01 01 00 02 08 FF FF 0x00000000
13FB:0020 FF FF FF FF FF FF FF FF
13FB:0028 FF FF FF FF EA 13 20 FF 0x00000000
13FB:0030 00 16 14 00 18 00 FB 13 0x00000000
13FB:0038 FF FF FF FF 00 00 00 00
13FB:0040 07 0A 00 00 00 00 00 00
13FB:0048 00 00 00 00 00 00 00 00
13FB:0050 CD 21 CB 00 00 00 00 00 = 0x00000000
ax FFF0 c=0
bx 0001 z=0
cx FFEA s=1
dx 0000 o=0
si 05AA p=0
di 05B0 a=1
bp FFD8 i=1
sp FFCE d=0
ds 1600
es 1600
ss 1600
cs 140B
ip 043A
55:0008 6E61
55:0006 6C72
55:0004 6F42
55:0002 0000
55:0000 0000
55:FFFE 0000
55:FFFC 0000
55:FFFA 0000
55:FFF8 0158
55:FFF6 0000
55:FFF4 0003
55:FFF2 0002
55:FFF0 0001
55:FFEE 0006
55:FFEC 0005
55:FFEA 0004
55:FFE8 00C9
55:FFE6 106C
55:FFE4 1600
55:FFE2 0000
55:FFE0 000A
55:FFDE 0000
55:FFDC 0009
55:FFDA 0000
55:FFD8 0008
55:FFD6 FFD8
55:FFD4 FFEA
55:FFD2 FFF0
55:FFD0 02C0
55:FFCE FFF6
```

Demo result output; you'll need to compute them.

```
MS-DOS Prompt - TD
Auto
Turbo Link Version 7.1.30.1. Copyright (c) 1987, 1996 Borland International
Available memory 4092920
C:\lab6>td matrix
Turbo Debugger Version 5.0 Copyright (c) 1988,96 Borland International
Enter the first 3 dimensional vector below
enter x component: 1
enter y component: 2
enter z component: 3
Enter the second 3 dimensional vector below
enter x component: 4
enter y component: 5
enter z component: 6
Cross Product:
x:8      y:9      z:10
Dot Product: : 7
Continue y/n [n]:
```

*The cross/dot product results here are only to illustrate their locations on the stack. You need to compute them correctly in your code