

TA: Jade Cheng
ICS 312
Homework Solution #17
Due Date: October 01, 2009

Macros for lines Homework Code

```
:
:                               ; within the mymacro.txt file
:
;; ----- Jade's code -----
;; draw a vertical line
vl macro x, y, len, color
    local  again
    pusha
    cld                               ; set DF for left to right
    mov    al, color                   ; set color
    mov    cx, len                     ; number of pixels to display
    mov    di, y*320+x                 ; di = rows * 320 + cols
again:
    mov byte ptr es:[di], al
    add di, 320
    loop again
    popa
    endm
;; draw a right diagonal line
drl macro x, y, len, color
    local  again
    pusha
    cld                               ; set DF for left to right
    mov    al, color                   ; set color
    mov    cx, len                     ; number of pixels to display
    mov    di, y*320+x                 ; di = rows * 320 + cols
again:
    mov    byte ptr es:[di], al
    add    di, 321
    loop  again
    popa
    endm
```

```

;; draw a left diagonal line
dll macro x, y, len, color
    local    again
    pusha
    cld                      ; set DF for left to right
    mov     al, color        ; set color
    mov     cx, len         ; number of pixels to display
    mov     di, y*320+x     ; di = rows * 320 + cols
again:
    mov     byte ptr es:[di], al
    add     di, 319
    loop   again
    popa
    endm

;; draw a horizontal line
hl macro x, y, len, color
    mov     di, y*320+x     ; di = rows * 320 + cols
    cld                      ; from left to right
    mov     cx, len         ; draw len that long
    mov     al, color       ; color attribute
    rep     stosb
    endm

;; ----- End of Jade's code -----

```

```

; this program tests the draw line macros in the mymacro.txt file.
.model small
.586
.stack 100h
.code
include mymacros.txt ; include mymacros.txt file
main proc
    mov     ax, @data
    mov     ds, ax
    mov     ah, 0        ; set graphics mode
    mov     al, 13h
    int     10h
    mov     ax, 0a000h   ; set ES
    mov     es, ax

```

```

hl      50, 10, 200, 4      ; draw a horizontal line
vl      150, 10, 100, 4    ; draw a vertical line
dr1     150, 10, 100, 4    ; draw a right diagonal line
dll     150, 10, 100, 4    ; draw a left diagonal line
mov     ah, 1                ; wait for a keystroke
int     21h
mov     ah, 0                ; restore graphics mode to mode 3
mov     al, 3h              ; and clear the screen
int     10h
mov     ax, 4C00h           ; 4c in ah is dos exit fn with return code in al
int     21h
main    endp
end     main

```

Macros for lines Homework Output

The screenshot shows a Windows command prompt window titled "C:\WINDOWS\system32\cmd.exe". The user is in the directory "C:\Users\Jade\Desktop\ICS 312 fall 2009\homework\hw17". The user enters the command "dir", which lists the contents of the directory. The output shows several files including "hw17.asm", "hw17.docx", "Jade's ICS 312 hw17.pdf", "mymacros.txt", and "UTIL.LIB". The user then enters the command "ml hw17.asm UTIL.LIB", which assembles the assembly file. The output shows the assembly process and the creation of the executable file "hw17.exe".

```

C:\Users\Jade\Desktop\ICS 312 fall 2009\homework\hw17>dir
Volume in drive C has no label.
Volume Serial Number is 6C86-A0A6

Directory of C:\Users\Jade\Desktop\ICS 312 fall 2009\homework\hw17

11/14/2009  06:05 PM    <DIR>          .
11/14/2009  06:05 PM    <DIR>          ..
11/14/2009  06:12 PM             1,097 hw17.asm
11/14/2009  05:30 PM             71,545 hw17.docx
11/14/2009  05:30 PM            73,712 Jade's ICS 312 hw17.pdf
11/14/2009  05:55 PM             3,823 mymacros.txt
02/28/2001  12:55 AM             8,863 UTIL.LIB
             5 File(s)          159,040 bytes
             2 Dir(s)      24,452,169,728 bytes free

C:\Users\Jade\Desktop\ICS 312 fall 2009\homework\hw17>ml hw17.asm UTIL.LIB
Microsoft (R) Macro Assembler Version 6.14.8444
Copyright (C) Microsoft Corp 1981-1997.  All rights reserved.

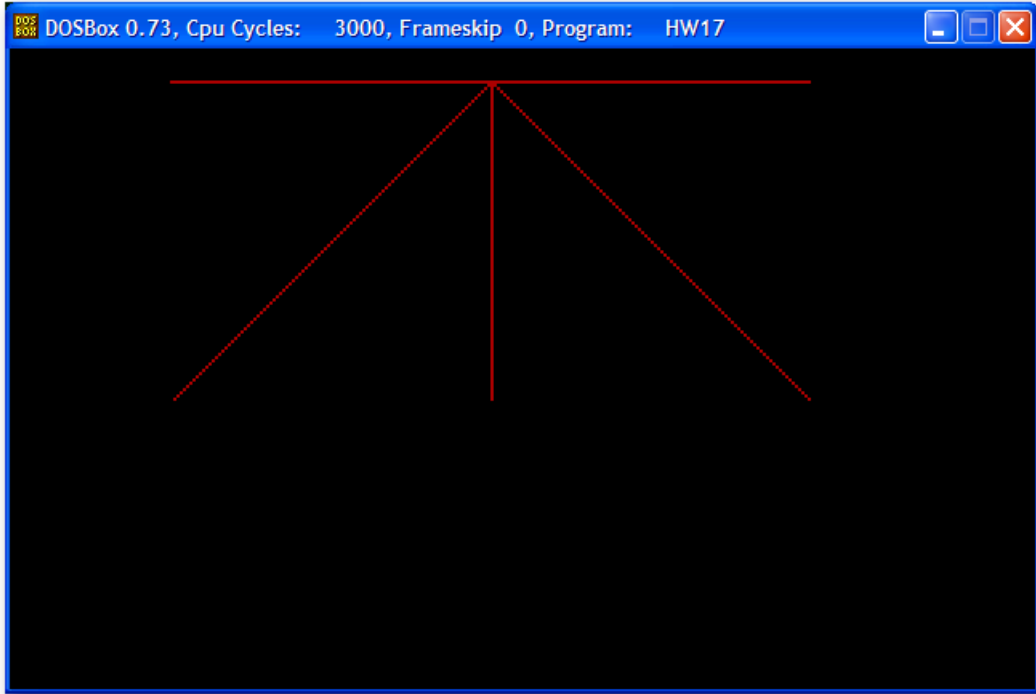
Assembling: hw17.asm

Microsoft (R) Segmented Executable Linker  Version 5.60.339 Dec  5 1994
Copyright (C) Microsoft Corp 1984-1993.  All rights reserved.

Object Modules [.obj]: hw17.obj
Run File [hw17.exe]: "hw17.exe"
List File [nul.map]: NUL
Libraries [.lib]: "UTIL.LIB"
Definitions File [nul.def]:

C:\Users\Jade\Desktop\ICS 312 fall 2009\homework\hw17>_

```



Clicking any key:

