

CS 2422: Assembly Language and System Programming Fall 2008

Assignment 3

(Release on November 18, 2008)

DUE: 23:59 December 5, 2008

Goal:

Practice using x86 Assembly Language with Microsoft Visual C++ 6.0 by implementing a procedure in assembly language, which would be called by a C program.

Requirements:

- Setup step: Download the *assignment3* files from the course website.
 1. *setting.doc*: This document discusses how to set up the programming environment with Microsoft Visual C++ 6.0.
 2. *casn.c*: This is the C program that you will use to develop your assembly procedure.
- The file *casn.c* defines three prototypes of the procedures. Please read *casn.c* to study the parameters of each procedure. Use the stack to pass the parameters to the procedures.
- Create three main asm files to implement the three procedures.
- You may create multiple asm files to help the procedure work smoothly.
- Followings are the data structures of the parameters.

```
typedef struct coordinate {  
    int    x;  
    int    y;  
}coord;
```

```
typedef struct RGB_color {  
    int    column;  
    int    row;  
}color;
```

- Table 1 shows the color table defined in this homework. You need to transform the *color* coordinates into numbers similar to those shown in Table 2.

Table 1: Parameters in C program (e.g. White = (3,3))

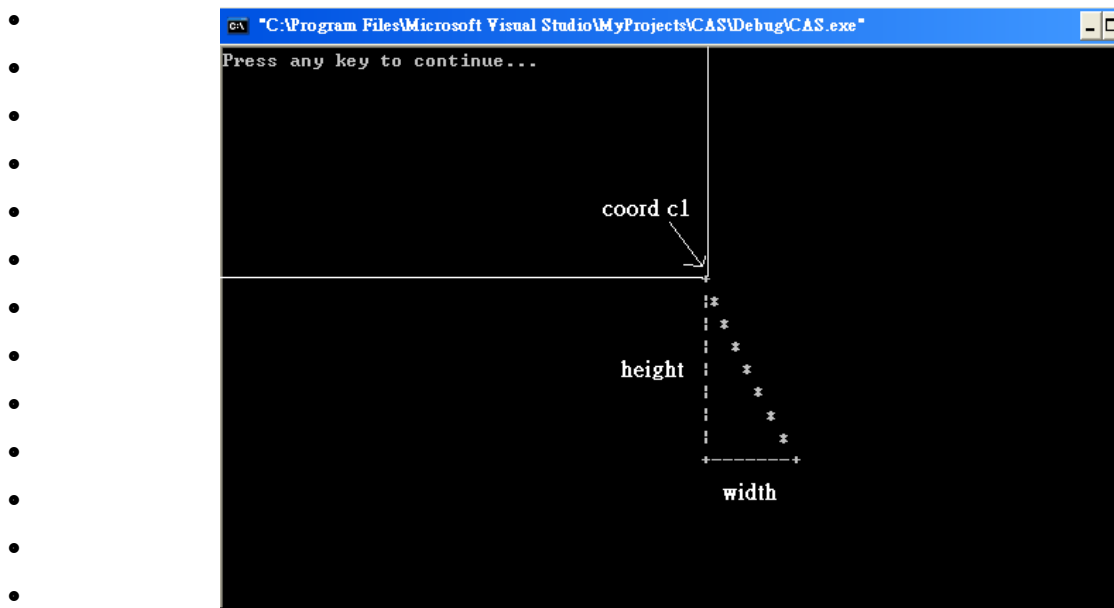
row \ col	0	1	2	3
0	Black	Red	Gray	Light-Red
1	Blue	Magenta	Light-Blue	Light-Magenta
2	Green	Brown	Light-Green	Yellow
3	Cyan	Light-Gray	Light-Cyan	White

Table2: Predefined color constants in MASM (e.g. White = 15. You need to transform (3,3) into 15))

Black = 0	Red = 4	Gray = 8	Light-Red = 12
Blue = 1	Magenta = 5	Light-Blue = 9	Light-Magenta = 13
Green = 2	Brown = 6	Light-Green = 10	Yellow = 14
Cyan = 3	Light-Gray = 7	Light-Cyan = 11	White = 15

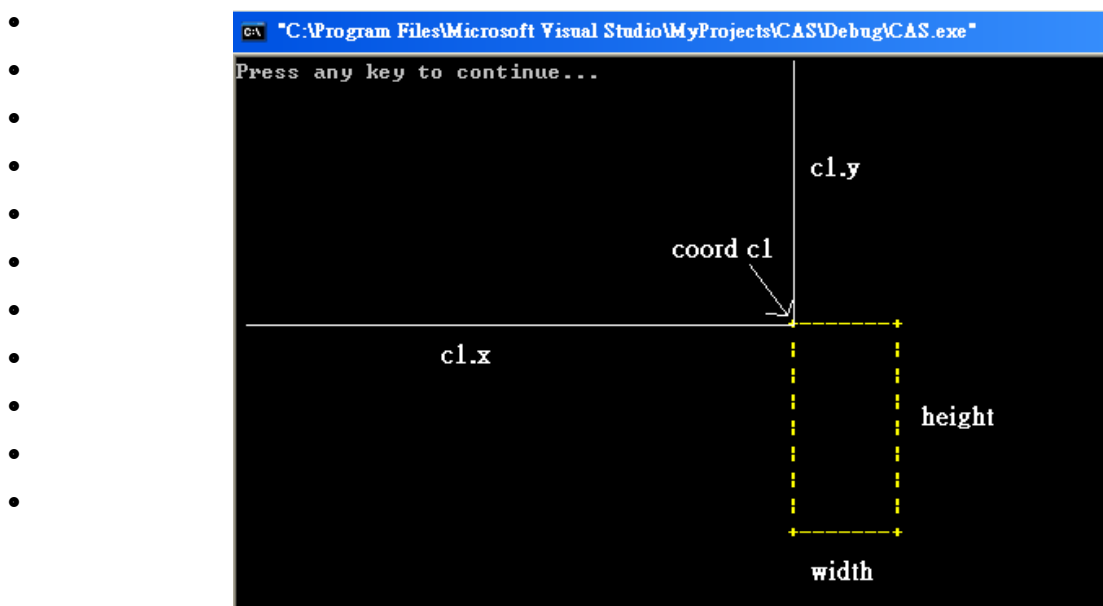
- Procedure 1: Draw a triangle. Use “+” to present three vertices. And use “*” to draw the bevel edge.

• extern "C" void draw_triangle(coord* c1 , color* r1 , int width , int height);



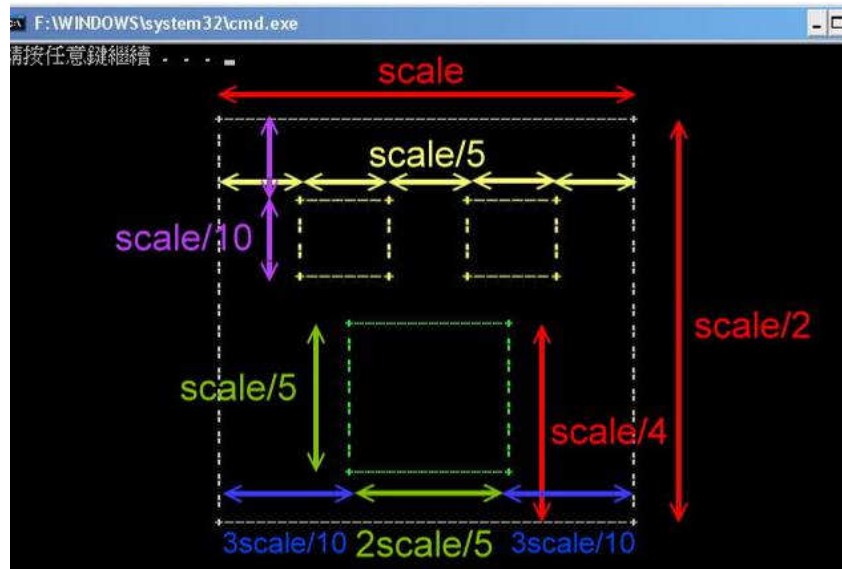
- Procedure 2: Draw a face with rectangle. Use “+” to present four vertices. And use “-” and “|” to draw edges.

• extern "C" void draw_rectangle(coord* c1 , color* r1 , int width , int height);



- Procedure 3: Draw a face with square. Use “+” to present four vertices. And use “-” and “|” to draw edges.

extern "C" void draw_face(coord* c1 , color* r1 , color* r2 , color* r3 , int scale);



Grading:

- (60%) A completely working program is finished.
The code should be complete or almost done (meaning the basic structure of the code is correct but the code may still have bugs), and can be assembled correctly.
- (30%) The program produces correct results.
- (5%) Read me file.
- (5%) Readability (including comments in your program).
- Late Penalty: All assignments are due at midnight (i.e., 24:00) on the due date. The late penalty is 20% for each day (or fraction) past due.
- Early Bonus: For programming assignments, there is an early bonus of 2% per day for up to 4% total.

Submit your assignment:

- Use ftp to enter `ftp://cs2422:cs2422@140.114.79.26:2527/` under “hw3”
- You need to zip all your files into a single zip file and name it with your Student ID (e.g., 9600000.zip/rar).

The zip file should contain the following files:

1. Original main program *casm.c*.
2. Please name this .asm file as “student ID_hw3.asm” (e.g., 9600000_hw3.asm). If you have more than three asm file, just name each file using a name that you can distinguish (e.g., 9600000_hw3_triangle.asm, 9600000_hw3_face.asm).
3. *.dsp and *.dsw file.
4. The “Read me” file should include: (1) the program’s flow path, and (2) how to execute the program. Please name this .txt file as “student ID_hw3.txt” (e.g., 9600000_hw3.txt).

- Deadline: 12/05 23:59

Honor Code:

Any cheating will be handled seriously in compliance with the university rules. Discussion of assignments is encouraged, but copying is prohibited and considered as cheating.