

**Student Name:** \_\_\_\_\_

Course: SWE 110 “ C Programming”

Dry-run: Simulated Mid-term exam.

- The exam is 90 minutes (=1.5 hours).
- You are allowed to use any written material (in hard copy or on the computer), including the book, homework solutions, and lecture slides.
- You are **NOT** allowed to search the internet for terms, code snippets, etc. In other words, no internet please.
- You are asked to use Visual Studio and need to submit the written code in electronic format as attachment.
- Please write clear programs: Either use comments, or make it clear otherwise.

There are 3 questions, roughly dealing with: Strings/Characters, 2D arrays, nested loops.

The valuation rubric includes:

1. Solution correctness
2. Follows specifications and constraints
3. Applies previous knowledge (Math/Eng/Science) to current task
4. Efficiency of solution
5. Delivery : On time and in proper form (documentation/comments)

### Question 1: (25 points)

```
/*  
Complete the below program, which combines two strings of equal length.
```

```
The function "strcomb" takes 3 arguments:  
s1: Input string 1  
s2: Input string 2 (of the same length as s1)  
sout : Output string 3
```

```
sout is composed of alternating characters from s1 and s2.  
The function returns the length of the resulting string, sout.
```

```
Example:  
s1="Hello"  
s2="World"  
then  
sout="HWeolrllod"  
and the return value is: 10.
```

See also screen shot below.

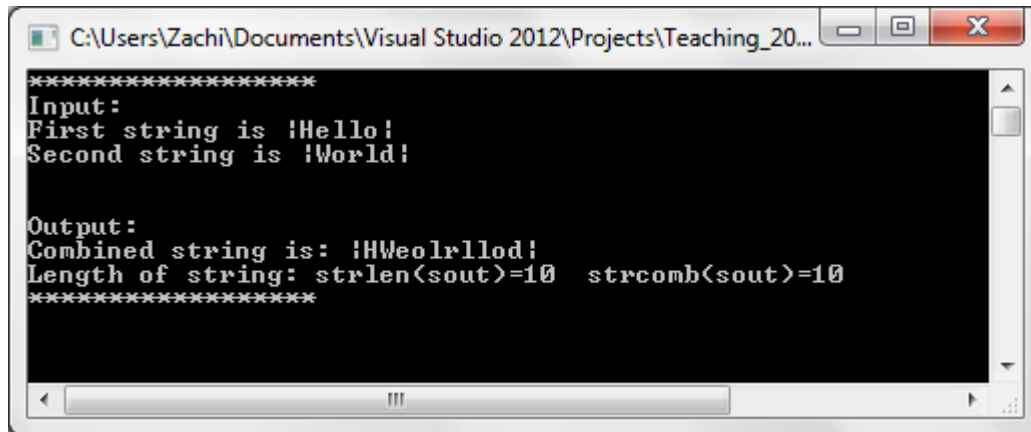
You are allowed to use only the functions described in this file.

```
*/  
  
#include <stdio.h>  
  
int strlen(char s[]);  
int strcomb(char s1[], char s2[], char sout[]);  
  
int strlen(char s[])  
{  
    ** fill in missing code **  
}  
  
int strcomb(** fill in the missing parameter list **)  
{  
    ***fill in the function body ***  
}  
  
main()  
{  
    char s1[80] = "Hello";  
    char s2[80] = "World";  
    char sout[80];  
    int l;  
  
    printf("*****\n");  
    printf("Input:\n");  
    printf("First string is |%s|\n",s1);  
    printf("Second string is |%s|\n",s2);  
  
    l = strcomb(s1,s2,sout) ;
```

```
printf("\n\nOutput:\n");
printf("Combined string is: |%s|\n",sout) ;
printf("Length of string: strlen(sout)=%d  strcmp(sout)=%d\n",
        strlen(sout), strcmp(s1,s2,sout));
printf("*****\n");

getchar();
}
```

Example screen shot:



```
*****
Input:
First string is :Hello!
Second string is :World!

Output:
Combined string is: :HWeolrllod!
Length of string: strlen(sout)=10  strcmp(sout)=10
*****
```

ANSWER 1

## Question 2: (25 points)

/\*  
Complete the below program, which creates a pyramid.  
  
The program prompts the user for an input as integer, and terminates when the user enters negative number.

The function "printPyramid" takes one argument:  
r: number of rows in pyramid

The function returns the number of columns the base spans.

Example:

r=3

The function prints:

```
*  
***  
*****
```

and the return value is: 5.

See also screen shot below.

You are allowed to use only the functions described in this file.

\*/

```
#include <stdio.h>
```

```
int printPyramid(int r);
```

```
int printPyramid(** fill in **)
```

```
{
```

```
}
```

```
main()
```

```
{
```

```
/* Below are only SOME of the print commands used, to save you printing time. */
```

```
printf("Please enter number of rows (negative number to end):");
```

```
printf("Printing pyramid\n");
```

```
printf("Length of base returned is %d.\n\n",l);
```



### Question 3: (25 points)

```
/*  
Complete the below program, which prints 2d array by values and by symbols.
```

The program has an initialized 2D array. The program then calls the function `printValues`, which prints the 2d array values, and then calls `printSymbols` that prints the 2d array as symbols.

The function `printSymbols` calls the function `value2symbol`, which converts (using a switch statement) the values into symbols, according to the following rules:

```
whenever the array value is 0 --> prints out 'o'  
whenever the array value is 1 --> prints out 'x'  
whenever the array value is 2 --> prints out '-'  
whenever the array value is 3 --> prints out '|'  
whenever the array value is 4 --> prints out '+'  
whenever the array value is 5 --> prints out ' '
```

See also screen shot below.

You are allowed to use only the functions described in this file.

```
*/  
  
#include <stdio.h>  
  
#define ROWS 7  
#define COLS 8  
  
void printValues(int a[][COLS]);  
void printSymbols(int a[][COLS]);  
char value2symbol(int i);  
  
void printValues(int a[][COLS])  
{  
    int rr, cc;  
  
    for (rr=0; rr<ROWS; ++rr)  
    {  
        for (cc=0; cc<COLS; ++cc)  
        {  
            /* fill in one "printf" command here */  
        }  
        printf("\n");  
    }  
}  
  
char value2symbol(int i)  
{  
    /* you need to write THIS function */  
    return ('?');  
}  
  
void printSymbols(*** fill in here***)
```

```

{
    /* you need to write THIS function */
}
main()
{
    int a[ROWS][COLS]={
        {0,0,0,0,0,0,0,0},
        {0,4,2,2,2,2,4,0},
        {0,3,5,5,5,5,3,0},
        {0,3,5,1,1,5,3,0},
        {0,3,5,5,5,5,3,0},
        {0,4,2,2,2,2,4,0},
        {0,0,0,0,0,0,0,0}};

    printf("Original Array Values:\n");
    printValues(a);

    printf("\n\nArray Symbols:\n");
    printSymbols(a);

    printf("\n\n***Exiting...");

    getchar();
}

```

```

C:\Users\Zachi\Documents\Visual Studio 2012\Projects\Teaching_2014\array2dMeshGrid\Debug\a...
Original Array Values:
00000000
04222240
03555530
03511530
03555530
04222240
00000000

Array Symbols:
00000000
0+----+0
0! !0
0! xx !0
0! !0
0+----+0
00000000

***Exiting....

```

ANSWER 3

