CSCE 206 Spring2018 Lab: Assignment #4

Submission Deadline: 23:59, April 01, 2018, Sunday.

1. **Follow the submission guideline to submit the assignment through eCampus.**
2. **Add comments to your code, including your name, UIN and the class section you are in with the block comments to the head of your code file.**

Question 1. Characters Merge (50 points)

Write a C program to accept two string letters input and merge them as an ascending alphabet string and display it on screen.

Suppose two input string letters have been sorted as ascending order already. For instance, abcdef is a string letter on its ascend order and neither bacdef nor abcdfe is qualified; Also, either Aa or Ab is an alphabetically ascending while neither aA nor bA is. You only consider an ascending string for input. Design a function to merge these two characters into one according to ascending order. Name your program file **Hw4_q1_code.c**.

Requirements are following:

1. **Not allowed** to use any library function in head files that merge two strings or sort a string directly in an alphabetical order. You can use library functions within the scope of <math.h>, <stdio.h> and <string.h>. Write the merge function by yourself.
2. You can use **scanf/gets** function to accept input.

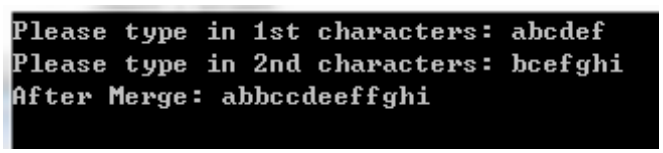
Sample input:

Please type in 1st characters: abcdef

Please type in 2nd characters: bcefghi

Sample output:

After merge: abbccdeeffghi



Hint:

char a, b. Figure out a mechanism deciding which one is bigger. See Professor's Ch5 slides. Understand what ASCII is and how a C string terminates.

Question 2. HexConverter (50 points)

Write a C program to accept a string of a nonnegative integer decimal number and then convert it as hexadecimal number and display on screen. Name your program file **Hw4_q2_code.c**. Requirements are following:

1. Use **scanf/gets** function to accept input and input type must be stored as a character array variable.
2. **Not allowed** to use any library function in head files that converts a character/string directly to integer/hexadecimal or converts integer/hexadecimal to a C string/character array. You can use library functions within the scope of <math.h>, <stdio.h> and <string.h>. Write the conversion function by yourself.

In hexadecimal, A, B, C, D, E, F is $10, 11, 12, 13, 14, 15$, respectively. Here are two instances of converting integer decimal to hexadecimal:

$$(31)_{10} = 1 \times 16^1 + 15 \times 16^0 = (1\text{F})_{16} ;$$

$$(379551)_{10} = 5 \times 16^4 + 12 \times 16^3 + 10 \times 16^2 + 9 \times 16^1 + 15 \times 16^0 = (5\text{CA9F})_{16} .$$

Sample input:

Please type in an integer decimal: 379551

Sample output:

Hexadecimal of the integer: 5CA9F

Hint:

1. Check professor's slide Ch5 and Ch6, to see how to process characters;
2. Write a char_to_int() function to implement converting char array to integer and make it function well;
3. Write a int_to_hex() function to implement converting an integer to hexadecimal (char array) and make it function well;
4. Return your result as a C string on screen.