PDS Lab Section 11

Lab Day 9 (Lab Test 2) – January 27, 2020

The top two lines of your programs must contain the following information:

//Roll No.: <Type in your roll no.>
//Name: <Type in your name>

You have to give different names to your C files and upload them in Moodle. Please read the instructions given below.

Document your programs meaningfully using appropriately named variable and sufficient amount of comments as suggested earlier. Also appropriately indent your program code. There will be marks for documentation.

1. Write a program that defines two integer arrays in the main function named **set1** and **set2** of size 20 each, and another integer array named **tmp** of size 40. Based on this, complete the following functions (You should pass only appropriate arrays as parameters to the functions):
   a) **main:** It should first declare and fill the arrays **set1** and **set2** with random integers in the range [10,20] while taking care that there are no duplicate numbers in each array (It means, all elements of the array **set1** are distinct and all elements of the array **set2** are distinct. However, there might be some elements common in **set1** and **set2**). Then, display the two arrays properly formatted. It also declares the array **tmp**. Next, in an infinite loop, prompt the user to enter a choice. Depending on whether the user enters 1 or 2, call the functions either **get_union** or **get_intersection** appropriately, and on entering 3 as the choice the program should exit.
   b) **get_union:** This function should determine the union of the two sets of elements (represented in **set1** and **set2**). After returning from this function, in the main function, the union of the elements of **set1** and **set2** should be printed.
   c) **get_intersection:** This function should determine the intersection of the two sets of elements (represented in **set1** and **set2**). After returning from this function, in the main function, the intersection of the elements of **set1** and **set2** should be printed.

   Name your C program file as LD9_1_<roll_no>.c. **[20 Marks]**

2. Write a C program with the following specification. In the main program, read a string of size at most 20 characters from the user and display it. Then call the functions **check**, **encode1** and **encode2** one after another.
   a) **check:** This function should take a string as its parameter and check how many times the letter 'a' appears before 'b' separated by exactly 2 characters in the string and display the result.
   b) **encode1:** This function should take a string as its parameter and then encode the characters of the string by replacing them as follows: a → c, b→ d,…, y→a,z→b. It should then display the encoded string.
   c) **encode2:** This function should take a string as its parameter and substitute the character 'a' before every character in the string. It should then display the encoded string.

   Example 1. Input string a: Expected output: 0 c aa
   Example 2. Input string acdb: Expected output: 1 cefd aaacadab
   Example 3. Input string aaab: Expected output: 1 cccd aaaaaaab

   Name your C program file as LD9_2_<roll_no>.c. **[30 Marks]**

Submit your .c files in Moodle against the assignment submission link for Lab Day 9.