

## PDS Lab Section 11

### Lab Day 6 (Lab Test 1) – January 6, 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. There will be marks for documentation.**

1. Two distinct numbers are said to be **sum of digit preserving pair**, if the sum of sum of their digits is the same as the sum of digits of their sum.

Example 1: 13 and 14 form a **sum of digit preserving pair** since sum of sum of the digits is  $(1+3) + (1+4) = 9$  and sum of digits of their sum 27 is also  $2+7=9$ .

Example 2: 13 and 18 do **not** form a **sum of digit preserving pair** since sum of sum of the digits is  $(1+3) + (1+8) = 13$  and sum of digits of their sum 31 is  $3+1=4$ .

Write a C program to display all **sum of digit preserving pairs** between 13 and 23 (both included). One such pair will be printed in each line as follows:

13 and 14

13 and 15

....

Note 1: If you have printed 13 and 14, you should not print 14 and 13 again.

Note 2: The program does not take any input from the user.

Name your C program file as LD6\_1\_<roll\_no>.c.

[20 Marks]

2. Write a C program to do the following.

Declare an integer array of size 30. Fill the array with random numbers in the range of 10 to 100. Display the array of numbers. The program then segregates the odd and even elements in the array, such that all odd elements appear in the left side of the array without disturbing their relative positions in the original array and the even elements appear on the right side of the array without disturbing their relative positions in the original array. Display the segregated array of numbers. You are NOT allowed to use any other array. Note: The program does not take any input from the user.

Example1: Let the original array elements be 10 19 11 50 23 70 81. Then the segregated array is 19 11 23 81 10 50 70. Note here that in the segregated array, all the odd elements 19 11 23 81 are to the left of all the even elements 10 50 70. Also, the relative positions of the odd elements are unchanged, i.e., 19 is before 11 in the new array since in the original array also 19 was before 11. Similarly, 70 is after 50 in the new array since in the original array also 70 was after 50.

Example 2: Let the original array elements be 5 8 20 7 19 4 15 12. Then the segregated array is 5 7 19 15 8 20 4 12.

Name your C program file as LD6\_2\_<roll\_no>.c.

[15 Marks]

3. Write a program that reads a scale factor **s** (**s** is a number between 1 and 8) and number of lines **n** (**n** is a number between 1 and 10). Based on the scale factor, it will display the digits between 1 to (3+s) repeatedly with (2+s) digits in each line. The remaining digits will be printed at the start of the next line and this will continue. A total of **n** lines will be printed.

Explanation: If **s**=1 and **n**=6, we have to repeatedly print the digits between 1 to (3+1), i.e., the digits 1, 2, 3 and 4. In each line, (2+1), i.e., 3 digits will be printed. The remaining digits will be printed at the start of the next line. A total of 6 lines will be printed since **n**=6.

Example inputs/outputs are given below:

Example 1:

Input

Enter scale factor: 1

Enter number of lines: 6

Output

123

412

341

234

123

412

Example 2:

Input

Enter scale factor: 2

Enter number of lines: 5

Output

1234

5123

4512

3451

2345

Example 3:

Input

Enter scale factor: 3

Enter number of lines: 3

Output

12345

61234

56123

Name your C program file as LD6\_3\_<roll\_no>.c.

[15 Marks]

Submit your .c files in Moodle against the assignment submission link for Lab Day 6.