1806ICT Programming Fundamentals

Arrays and Character Arrays (Strings)

1. Write a program that reads in the size of an array and the array elements (all of which are integers). The program then computes the sum of all the elements in the given array. Note: If the input is 3 1 4 8, then the array has 3 elements {1, 4, 8}.

   Hint: After you read the first number into variable n you know how many integers to read.

   Sample Run:

Input	Output
3 1 4 8	13
5 2 4 6 8 13	33

2. Write a program that reads in the count of array elements and the actual array elements (all of which are integers). Your program must rearrange the numbers in the array such that every 3 is followed by a 4. Do not move the 3's, but every other number may move. The given array contains the same number of 3's and 4's. Every 3 has a number after it that is not a 3 or 4, and a 3 appears in the array before any 4.

   Sample Run:

Input	Output
4 1 3 1 4	1 3 4 1
4 3 2 2 4	3 4 2 2
7 1 3 1 4 4 3 1	1 3 4 1 1 3 4

3. Write a program that reads in the count of array elements and the actual array elements (all of which are integers). The program then prints out an array that contains the exact same numbers as the original given array, but with the array elements rearranged such that all the even numbers come before all the odd numbers. Other than the latter requirement, the numbers can be in any order. Challenge: Instead of using a new array to store the rearranged numbers, try to rearrange the numbers in the original given array itself.

   Sample Run:

Input	Output
4 3 4 5 6	6 4 5 3
5 14 2 5 13 9	14 2 5 13 9

4. Write a program that reads in the count of array elements and the actual array elements (all of which are integers). Print a version of the given array where each zero value in the array is replaced by the largest odd value to the right of the zero in the array. If there is no odd value to the right of the zero, leave the zero as a zero.

   Sample Run:

Input	Output
4 0 5 0 3	5 5 3 3
4 0 4 0 3	3 4 3 3
6 7 0 4 3 0 2	7 3 4 3 0 2

5. Write a C program to check whether a given substring is present in a given string.

6. Write a program in C to concatenate two strings manually.

7. Write a program that performs the addition of two matrices of the same size. An example showing the addition of two matrices is given below:

$$\begin{pmatrix} 3 & 6 & 1 \\ 2 & 1 & 4 \\ 5 & 2 & 3 \end{pmatrix} + \begin{pmatrix} 4 & 1 & 3 \\ 2 & 5 & 5 \\ 1 & 2 & 3 \end{pmatrix} = \begin{pmatrix} 7 & 7 & 4 \\ 4 & 6 & 9 \\ 6 & 4 & 6 \end{pmatrix}$$

Use two 2-D arrays to store the elements for the two matrices.